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A BIG SALUTE TO THE CORONA WARRIORS

From the Desk of the Chief Editor

COVID-19 Pandemic: A Challenge for Humanity

After Spanish flu Pandemic almost 100 Years back, World community was taken by surprise when it learnt about emergence of COVID-19 in December 2019 from China. This disease is a highly infectious zoonotic disease . As per World Health Organization(WHO), a zoonotic disease is any disease or infection which is naturally transmissible from a vertebrate animal to humans .A dominant theory is that the new corona virus was initially a disease affecting bats, before transiting to humans via an intermediary species such as pangolin. This virus was also suspected to be an agent of biological warfare unleashed on the World, but so far it has not been conclusively proved. Given the location of the initial outbreak, it is likely that the virus made the jump to humans at a wet market in Chinese city of Wuhan, where wild animals including bats and pangolins are traded. In the past also zoonotic diseases like SARS,MERS,Avian influenza etc had created grave public health problems world over .Already more than 35 million cases of Covid-19 have been reported in the World as of 03 Oct 2020 and lacs of cases and deaths are being reported every day. The mortality rate is ranging from 1.5 to 5 %.The figures are changing every passing day.

Initially when cases were reported from China, no travel restrictions were imposed, with the result, the disease started spreading to various countries through air travel and all other possible routes since December 2019 or may be earlier. WHO declared it a public health emergency on 31 January 2020 only after other countries started reporting cases and after it was realized that the disease has spread to many countries, WHO declared it Pandemic on 11 March 2020,by this time it was too late. The disease was given a name-COVID-19.

The very high morbidity and mortality associated with Covid -19 is a reason for worry throughout the World, especially when we do not have effective treatment and a preventive vaccine against it.Covid-19 lead to various countries taking different decisions about Quarantine, isolation and lockdowns. This is causing lot of social and economic disruption throughout the World and a big strain on Medical and Health services.

Though the disease runs a comparatively mild course in adolescents and adults up to sixty years, it can run severe course in children below 10 years and people above 65 years with co morbidities. Mild illness manifests as sore throat, dry cough ,fatigue, fever, loss of sense of smell etc ,but severe cases may develop pneumonia and complications leading to multi organ failure and death.

The virus is mostly transmitted by droplet infection while coughing ,talking and sneezing. It can also be transmitted through fomites , hand shake, kissing, hugging and faeco oral route. In hospitals, aerosol generating procedures can result in infection to health care providers. There are more chances of people getting infected in closed spaces like travel by Aircraft and congested meeting places and in crowded living conditions.

The diagnosis depends on clinical features ,swabs taken from naso pharynx and bronchial lavage are put through the testing by real time reverse transcriptase PCR(gold standard).Antigen and antibody testing is also being done.Chest HR CT is also diagnostic of pulmonary manifestations.

Since there is no effective cure and a preventive vaccine at present, only prevention will work. Preventive measures for general public like wearing a face mask ,frequent hand washing with soap and water/use of hand sanitizers ,physical distancing of at least six feet, following respiratory hygiene like coughing or sneezing in to the inner of elbow ,avoiding going to crowded places ,sitting in air conditioned enclosed places for meetings ,watching movies etc will have to be enforced and health education of public at large will be vital in this endeavor. Health care workers should follow the laid down universal precautions and done Personal Protective Equipment including N95 mask, while dealing with patients.

ACKNOWLEDGEMENTS

I would like to place on record my sincere thanks to Shri Rahul Agarwal, Chairman, Pacific Medical University, Udaipur , Dr A P Gupta, Vice Chancellor, Pacific Medical University, Udaipur,Dr D P Agarwal,former President PMU and my entire team as well as contributors of research papers for their whole hearted support in bringing out this issue of Journal.

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Editorial

The Corona Warriors

"It's a war against Coronavirus." Of all our endless wars, the most protracted is our war against dangerous microbes, of which the covid-19 coronavirus is the latest battle.

The metaphor is worth pursuing. If we are at war with the coronavirus, then the front-line soldiers are the workers who are putting their lives on the line by providing essential services. First and foremost is the hospital staff, led by doctors and nurses, but including everyone needed to keep the full infrastructure of the medical system functioning.

The 2019–2020 coronavirus pandemic is upending life on a global level as we know it. The highly infectious coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Needless to say, doctors, nurses and people working in health-care sectors are particularly vulnerable to the highly infectious disease. In response to the global pandemic, the under-resourced doctors have been facing unprecedented challenges. The list of the sleep-deprived heroes includes doctors, nurses, medical cleaners, pathologists, paramedics, ambulance drivers, and health-care administrators. In the fight against coronavirus, the brave medical army stands strong with thermometers, stethoscopes, and ventilators as their weapons. Not to forget, medical researchers are working day in and night out against all odds, hoping to find the antidote to the disease.

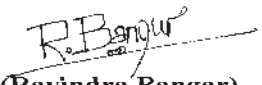
Since the coronavirus outbreak, health-care professionals have not only experienced the gratification of healing patients and saving their lives but have also lost many battles along the way. On top of that, many doctors have even sacrificed their own lives in the line of duty. Early research has shown that hospitals themselves are amplification points for the virus's spread and also, health care workers are more likely to contract the coronavirus than the average person and, when they get it, they suffer more severe symptoms.

Corona Warriors truly epitomise selfless service beyond the call of duty. Every day, the selfless warriors are giving it their all in health-care settings while cutting themselves off from their families and loved ones. Erratic work schedule, night shifts and long hours in the operation theatres and intensive care unit is a norm for doctors these days. Chronic fatigue, moodiness, trouble concentrating, fatigue, sleep deprivation, excessive worry, aggressive behaviour, impaired vigilance, loss of appetite, mood swings, and behavioural changes often are signs of stress. Front line warriors are not only facing a daunting task of handling and treating patients, but are also struggling to keep their own worries and emotional stress at bay. Also, it is unfortunate that guided missiles have been aimed at some of these corona warriors by some "masked", misguided and ill-informed elements of society. A few of these corona warriors have risked their lives in service of those very persons who had attacked them.

The sacrifice that Corona Warriors are making for the safety and welfare of humanity is priceless and deserves lifelong gratitude on our end. Most importantly, we must reassess the value health-care workers hold in our lives

and the kind of treatment they get from us. Among the several lessons this coronavirus pandemic has been teaching us, the biggest one is to find ways to sufficiently invest in the better and more efficient medical fraternity and give medical professionals the respect, compensation and infrastructure that they truly deserve once this crisis is over. We must immediately prioritize the use of those resources to health-care workers and first responders on a worldwide basis. Governments must support manufacturers in providing N95s and other equipment to front-line health-care providers and other essential workers. In terms of minimizing illness and death, this will be more important than any border closing, airport screening or quarantine. And it is no less than our front-line warriors deserve. Moreover, the world needs to work towards advancement in medical research and technology. Nothing will be a greater tribute to the health-care workers than this.

"The virus may be an invisible enemy. But our warriors, medical workers are invincible.
In the battle of invisible vs. invincible, our medical workers are sure to win."
- Indian Prime Minister Narendra Modi, in a Video Conference



(Ravindra Bangar)
Editor

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Research Paper

The Association between Maternal Hemoglobin Concentration and Neonatal Birth Weight: A Prospective Observational Study

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INTRODUCTION

Anemia is one of the frequently seen complications reported in pregnancy. According to WHO reports, 15 to 20% of women from developed countries are anemic while 35 to 75% (of pregnant women in resource limited nations[1].

During pregnancy, maternal iron requirement increases by 1 g due to increased fetal demand for iron[2]. Normal physiological changes affect the hemoglobin (Hb) in pregnancy, and there is an absolute or relative reduction in Hb concentration.

During normal pregnancy, red blood cell count rises due to erythroid hyperplasia of the marrow. But, compared to red cell mass, there is a significant rise in intravascular volume leading to dilutional or physiologicanemia of pregnancy. This is mostly seen at 30 to 34 weeks period of gestation. So, anemia is defined as hemoglobin (Hb) < 10 g/dL during pregnancy[3].

The leading causes of anemia in pregnancy are iron and folic acid deficiency. Severe anemia is known to have adverse effects on the mother and the fetus. There are several complications that increase with severe anemia like spontaneous abortions, prematurity, low birth weight, and fetal deaths[4,5].

There are many studies that have reported a significant association between anemia in prenatal period and low birth weight babies. On the other side, very high hemoglobin concentration (>13gm/dl) causes increased viscosity of blood, which results in inadequate delivery of oxygen to tissues. Many studies have also reported an association between increased maternal hemoglobin concentration and an increased incidence of adverse pregnancy outcome[6].

Concentration of 9.5–11.5 g/dL with a normal mean corpuscular volume (MCV) should be considered optimum for growth of fetus. As anemia is regarded as one of the common medical conditions during pregnancy, this association is of significant importance. The objective of present study was to assess the relationship of maternal hemoglobin level in pregnancy with neonatal birth weight.

MATERIALS AND METHODS

This cross-sectional study was conducted at department of Obstetrics and Gynaecology, Pacific Medical College and Hospital, Udaipur, Rajasthan. The study period was 6 months from June 2019 to March 2020.The institute ethic committee approved the study protocol. We included all women giving birth to live neonate and having complete case files. We excluded patients with history of diabetes, multiple pregnancies, hematological disorders in mother, and the obstetric causes of the preterm labour (PTL), including abruption placenta or preterm rupture of membranes as well as pre-eclampsia and infants with gross congenital abnormalities. Informed written consent was taken from all participants before starting the study.

Baseline characteristics were recorded for all enrolled participants

including data related to their age, educational status, and place of residence, previous history of blood transfusion, family history of anemia, the number of previous pregnancies, number of antenatal visits, infant gender, and neonatal outcomes. Birth weight data was collected from case files of the newborns and gestational age (GA) were collected from the case files based on ultrasounds. The required data was obtained from medical records of the subjects and proforma was filled. The Hb measurement was done by Technicon H-1 blood counter. Based on WHO criteria, the Hb was classified into low (<10.5g/dl), normal (10.5-13g/dl), and high (>13 g/dl).

STATISTICAL ANALYSIS

Data were analyzed according to the assigned group (intention to treat analysis-ITT). Normality of data was checked with Kolmogorov-Smirnov Z test. Data were summarized as means with standard deviations (±SD) or medians with interquartile ranges (IQR), or proportions. Continuous data were compared by Student's t-test if normally distributed or Mann-Whitney U test if non-normally distributed. The binary outcome was analyzed with use of the chi-square test (Fisher's exact test if cell frequencies were small). A two-sided p-value of 0.05 was considered as statistically significant. IBM PASW statistics (SPSS)-version 20.0 software (SPSS Inc. Chicago, Illinois) and Epi Info ™ 7 (7.0.9.7, CDC) was used for data analysis.

RESULTS

We recruited a total of 405 pregnant women in this study. The mean age of the women was 26 years. Table 1 describes the demographic variables of the women. The mean birth weight of the newborns in our study was 2980 g (birth weight range: 2100-4700g). 21 (5.5%) of the neonates had low birth weight, while 353 (92.2%) newborns had the birth weight between 2500-4000 g; 9 (2.3%) cases had the birth weight of more than 4000 g.

The Hemoglobin categories of the subjects are shown in Table 2. The frequency of anemia in pregnant women increased from first to third trimester. The Mean Hb of the subjects was also lowest in the third trimester.

Table 1 Demographic Variables of Subjects

Variable		Frequency	Percentage
Place of residence	Urban	130	32%
	Rural	275	68%
Level of education	Illiterate	35	8.6%
	High school	265	65.4%
	Graduate	105	26%
Economic status	Good	112	27.6%
	Moderate	204	50.4%
	Poor	89	22%
Neonate gender	Male	230	56.8%
	Female	175	43.2%
Birth weight	<2.5 kg	21	5.5%
	2.5- 4 kg	353	92.2%
	>4 kg	9	2.3%

Table 2 Hb Categories in each Trimester

Hemoglobin	1st Trimester Frequency	2nd Trimester Frequency	3rd Trimester Frequency
<10	112 (28%)	167 (41%)	203 (50%)
10-13	241 (59%)	204 (50%)	173 (43%)
>13	52 (13%)	34 (9%)	29 (7%)

Table 3 Relationship between Hb Categories and Birth Weight Categories in each Trimester

		Birth Weight		
Hemoglobin		<2.5 kg	>4 kg	>4 kg
1st Trimester	<10.5	81 (20%)	316 (78%)	8 (2%)
	10.5-13	28 (7%)	364 (90%)	12 (3%)
	>13	16 (4%)	373 (92%)	16 (4%)
2nd Trimester	<10.5	73 (18%)	320 (79%)	12 (3%)
	10.5-13	20 (5%)	38 (94%)	4 (1%)
	>13	8 (2%)	397 (98%)	0 (0%)
3rd Trimester	<10.5	81 (20%)	324 (80%)	0 (0%)
	10.5-13	8 (2%)	385 (95%)	12 (3%)
	>13	4 (1%)	60 (15%)	0(%)

Table 4 Relationship between Period of Gestation at Birth Categories and Hb Categories

		Period of Gestation at Birth		
Time	Hb	<37 weeks	37-40 weeks	>40 weeks
1st Trimester	<10.5	97 (24%)	303 (75%)	4 (1%)
	10.5-13	53 (13%)	316 (78%)	36 (9%)
	>13	16 (4%)	324 (80%)	65 (16%)
2nd Trimester	<10.5	138 (34%)	211 (52%)	56 (14%)
	10.5-13	32 (8%)	316 (78%)	57 (14%)
	>13	32 (8%)	369 (91%)	4 (1%)
3rd Trimester	<10.5	133 (33%)	202 (50%)	69 (17%)
	10.5-13	20 (5%)	332 (82%)	53 (13%)
	>13	4 (1%)	401 (99%)	0 (0%)

The mean GA of the subjects was 37 weeks (minimum GA: 30 weeks, maximum GA: 42 weeks). The PTL was observed in 38 (9.9%) subjects while term, and post-term pregnancies were observed in 296 (77.3%), and 49 (12.8%) subjects, respectively.

There was a significant relation between birth weight with the HCT and Hb levels in each trimesters (P<0.001) as per Chi square test. The association between the gestational age at birth with the Hb levels in pregnancy was also significant (P<0.01).

DISCUSSION

Maternal anemia is associated with sub-optimum outcome in pregnancy due to lower birth weight and preterm delivery[7,8].

As anemia is considered to be one of the common medical conditions during pregnancy, this association is of significant importance. Birth weight is the one of the most reliable determinant of mortality in the first year of life, and has therefore a strong claim to being a good indicator of the efficiency with which a woman has supported her fetus[9].

Our study has shown the striking association of birth weight withhemoglobin concentration. Our study reported the prevalence of anemia in 17.8% subjects. Anemia (Hb, 10 g/dl) was significantly associated with increased frequency of low birth weight (<2500 g).

Low birth weight is seen both in increased maternal Hb (>13 gm%) and maternal anemia (<9 gm %). Optimum hemoglobin concentration seems to be from 9 to 11 g/dl. Steer and colleagues [10,11] studied a large population of around

1,50,000 pregnancies and reported that the lower hemoglobin concentration during pregnancy (8.5–10.5 g/dL) is associated with maximum mean birth weight and the lowest incidences of LBW and preterm delivery. Malhotra, et al., for example, observed that the mean birth weight was highest in babies with maternal haemoglobin concentration between 9.6 and 10.5 gm% [12, 13]. It has been suggested that high levels of hemoglobin or serum ferritin reflect a failure in adequate plasma volume expansion or increased blood viscosity as a result of macrocytosis which would impair uteroplacental blood flow. This, in turn, might adversely affect fetal growth. Like this Chang et al also reported an increased incidence of LBW and preterm birth in association with either a high maternal hemoglobin concentration or high hematocrit[14].

The statistical analysis of this study shows that both high and low Hb Concentration are associated with adverse effect on birth weight. Several studies have reported that LBW babies are at higher risk of sepsis, hypothermia, hypoglycemia, asphyxia, and feeding problems, etc. in these neonates.

CONCLUSION

Optimum maternal Hb Concentration should be considered between 10-13 gm% for fetal growth and well-being and also associated with the lower incidence of low birth weight.

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Research Paper

Clinicoepidemiological Study of Foreign Bodies in Aerodigestive Tract

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ABSTRACT

Foreign body ingestion and aspiration are common occurrence for otorhinolaryngologists. Foreign bodies like coin, peanut, batteries, dentures etc are seen in almost all age groups and poses a challenge for the ENT surgeon. The present study was conducted retrospectively in 72 patients of foreign body aerodigestive tract in PMCH, Udaipur from March 2017 till March 2019. The strong clinical suspicion, timely management and early diagnosis are the keys to successful foreign body retrieval. All foreign bodies do not necessarily present as emergencies but some can be life threatening hence appropriate radiological imaging followed by timely intervention can reduce the mortality.

Keywords : Aerodigestive tract . Coin . Foreign body. Supari

INTRODUCTION

The foreign bodies are quite common in otorhinolaryngologist practice. The aerodigestive tract foreign bodies contribute significant percentage among all the foreign bodies presenting to ENT Surgeon. It is ranked as 3rd reason of death in children below one year. In children between one to six year it is assigned as 4th important reason of deaths among various other reasons[1]. It is more common in children because of their tendency to explore environment out of curiosity, lack of molar teeth and habit of putting everything in mouth. However foreign bodies can be found in all age groups irrespective of sex.

The foreign bodies can be of any size and shape. As per literature the Coin is a widespread foreign body among various types of foreign bodies observed[2,3]. Other common foreign bodies are groundnuts, batteries, toys, plastic objects, artificial dentures etc.

The mode of presentation of foreign body depends on its location. The digestive tract foreign body present with symptoms such as difficulty in swallowing, refusal to take feeds, vomiting, foreign body sensation etc while the foreign body of airway usually presents as cough, choking & cyanosis. Accidents with foreign body are common and the ease of dealing these depends on its location.[4]

AIMS & OBJECTIVES

The aims & objectives were to ascertain common age group, common types of foreign bodies, their location and management in present study.

MATERIALS & METHODS

A retrospective study was done on 72 patients presenting to Department of Otorhinolaryngology, PMCH, Udaipur. Thorough clinical history followed by meticulous examination was done with history of swallowing or inhalation of foreign body. Appropriate radiological examination to assess the location, number and

dimensions of foreign body to ensure its adequate removal was done.

As per the location of foreign body, the retrieval was performed by direct laryngoscopy, oesophagoscopy or bronchoscopy under general anaesthesia.

RESULTS

The most common age group was paediatric age group with 65 patients belonging to < 10 years age group, 3 patients belonging to 11-20 year, 1 patient from 31-40 year, 1 patient from 51- 60 year age group, 2 patient from > 60 year age group with no patients in 21-30 year age group.

The foreign bodies were most commonly seen in digestive tract with 65 cases and foreign body in airway in 7 cases (Table no. 1)

In digestive tract, maximum cases were seen in Cricopharynx with 60 cases followed by Oropharynx with 2 cases and Mid-Oesophagus & below with 3 cases. Among foreign bodies in airway bronchus was commonly involved with 4 cases on right side, and 1 case on left side, larynx (1) & trachea (1).(Table no. 2)

The presence of coin as foreign body was common occurrence in digestive tract (Figure 1&2) (56), artificial denture (5) and fish bone in 4 cases. In airway vegetative foreign body (4), supari (2), safety pin (1) were commonly found. (Table no. 3)

History of caregivers should be sought meticulously if they have any suspicion of foreign body

and appropriate steps should be taken promptly for timely diagnosis.

As per symptoms most of the cases presented with dysphagia (31) followed by odynophagia (25), foreign body sensation (10), vomiting (5). Refusal to take oral feeds and drooling of saliva was seen in paediatric age group. A few patients were asymptomatic (34). The most common symptoms were dyspnoea (3), cough (4). Among signs in foreign body airway rhonchi were seen in 3 cases, reduced air entry in 2 cases and hyperesonance in 1 case.

Among foreign bodies of digestive tract 61 patients showed radiological evidence and 4 cases of aiway had radiological evidence.

The direct laryngoscopy and oesophagoscopy was done in foreign body digestive tract cases and bronchoscopy in foreign body airway cases.

DISCUSSION

The foreign bodies can be found in almost all age groups but children are particularly more susceptible. This age group do not have molars and remain in haste while doing other daily activities hence do not chew food properly and to accidentally aspirate them[5,6]. In our study the paediatric age group was most common but elderly also showed foreign bodies because of use of artificial denture

In present study digestive tract foreign bodies are most common in digestive tract than airway. The previous studies also showed the similar results[7].

As per the location of foreign body cricopharynx was commonest site in digestive tract and right bronchus in airway which is similar to previous study[8]

The most common foreign body was coin[9]. Other common foreign bodies were vegetative foreign bodies, supari.

In oesophageal foreign bodies pooling of saliva and odynophagia was the most common presentation.[10]. Cough and dyspnoea are commonest presentation of foreign body in airway this is in accordance with previous studies[11].

Most of the foreign bodies in digestive tract were found to be radio-opaque, while in airway foreign bodies radiolucent hyper inflation or collapse of lung was found. This was in accordance with previous studies[12].

Rigid endoscopy is still the standard line of management in foreign body aerodigestive tract management. All the foreign bodies were removed with help of direct laryngoscopy, rigid oesophagoscopy or bronchoscopy and forceps as per the location as observed in past studies[13]. The foreign bodies which passes beyond oesophagus do not cause any further problem in 75 % cases.

CONCLUSION

Detailed clinical history, meticulous examination, appropriate radiological investigations and effective and prompt management thereafter leads to reduced morbidity and mortality.

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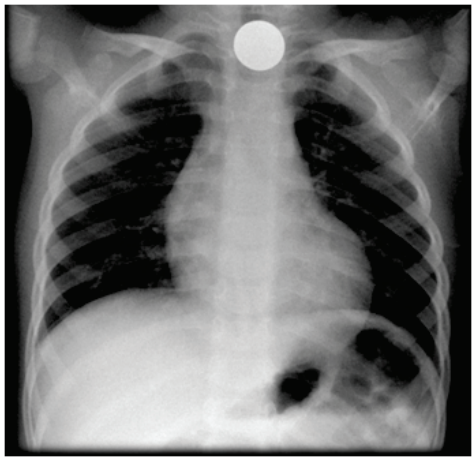

Figure 1

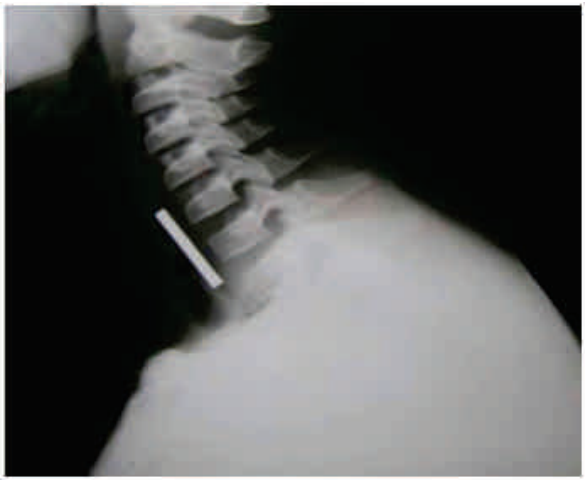

Figure 2

Table No. 1 - As Per Location of Foreign Body

S.No.	Location	Number	Percentage
1.	Digestive tract	65	90.28 %
2.	Airway	7	9.72 %
		72	100 %

Table No. 2 - As per Location of Foreign Body in Digestive Tract and Airway

S.No.	Location of foreign body	Number	Percentage
1.	**Digestive tract**	**65**	
a.	Cricopharynx	60	92.31 %
b.	Oropharynx	2	3.07 %
c.	Mid-Oesophagus & below	3	4.62 %
2.	**Airway**	**7**	
a.	Right Bronchus	4	57.14 %
b.	Left bronchus	1	14.29 %
c.	Larynx	1	14.29 %
d.	Trachea	1	14.29 %

Table No. 3 - As Per Type of Foreign Body

S.No.	Type of Foreign Body in the	Number	Percentage
	Digestive Tract	**65**	
1.	Coin	56	86.15 %
2.	Artificial denture	5	7.7 %
3.	Fish bone	4	6.15 %
	Airway	**7**	
1.	Vegetative foreign body	4	57.14 %
2.	Supari	2	28.57 %
3.	Safety pin	1	14.29 %

Research Paper

Effect of Diet on Superoxide Dismutase Enzyme and Its Relation with Anthropometric Parameters

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INTRODUCTION

Obesity is defined as a complicated, heritable, heterogeneous group of disorders. It develops as a result of complex interactions between polygenic multifactorial trait, environmental factors and behavior characterized by long term energy imbalance which can be due to excess consumption of calories, energy output can be insufficient, sedentary style of routine, low resting metabolic rate. Obesity is a disorder of body weight regulatory system characterized by an accumulation of excess energy in the form of body fat which impairs health. The hallmark of obesity is excess adipose tissue with a relatively absolute excess fat store.

Superoxide dismutase (SOD):

Superoxide dismutase (SOD) is an antioxidant metalloproteinase enzyme catalyzing the conversion of superoxide radical to hydrogen peroxide and molecular oxygen. This enzyme acts as a first line of defense to protect cells from the injurious effects of superoxide (Fridovich, 1975). [12]

SOD is a tetramer of approximately 80,000 molecular weight protein with each subunit being about 23 KD in size. There are three different types of SOD: The function of SOD seems to be that of protecting aerobic organisms against the potential deleterious effects of superoxide [2].

SOD has a major role in superoxide (O_2^-) anion radical metabolism. O_2^- is converted into hydrogen peroxide (H_2O_2) by SOD. [2].

SOD is a primary antioxidant.

$$O_2^- + O_2^- + 2H^+ \longrightarrow H_2O_2 + O_2$$

Angelika *et al.* (2005) [2] showed that the mean erythrocyte CuZn-SOD activity in obese women (660±39 U/g Hb) were significantly lower than in the group of non-obese female (873±52 U/g Hb).

According to Duangkamol *et al.* (2000) [10], significantly lower SOD activity was seen in overweight and obese subjects as compared to control subjects (1613 U/g Hb & 2750 U/g Hb respectively in male and 1571 U/g Hb & 2528 U/g Hb in female.

Olusi *et al.* (2002)[18] reported an inverse relationship between body mass index, the enzyme. Statistically significant negative association ($r = -0.566$; $P < 0.005$) between erythrocyte CuZn-SOD and body mass index was observed, which suggest that in obesity there is a low activity of the enzyme.

REVIEW OF LITERATURE:

Obesity, Oxidative Stress and Antioxidant Enzymes:

Olusi et al (2002) [18] studied the relationship between obesity and the stress He finally concluded that obesity is the main cause behind systemic oxidative stress along with improper regulation of adipocytokines which is the main reason of metabolic syndrome.

Vincet et al (2006) [23] determined the red blood cells antioxidant enzymes in context to overweight. Reactive oxygen species (ROS) which can cause the oxidative stress can react with unsaturated lipids and also leads to chain reactions called as lipid peroxidation in the membrane, which results in oxidation of lipids which are more atherogenic, which can decrease half life of bio-molecules, protein functions can be deranged; loss of functions of membrane phospholipids can be there, some toxic products can be accumulated; oxidized LDL, MDA, malondialdehyde proteins can be made MDA- DNA adducts can be formed. Our body's defence system can protect the cells against oxidative damage. There are some enzymes that directly metabolize ROS like superoxide dismutase, glutathione peroxidase and catalase. Superoxide dismutase plays a very important part in the ROS metabolism by directly dismuting the superoxide anion radical to H2O2 that can be further scavenged by catalase in the cells. In obese people who have (BMI>30.0kg/m^2), there were significantly positive relationship between systolic blood pressure and WHR, and superoxide dismutase could be related to weight, body mass index as well as catalase while opposite observations were seen for age and superoxide dismutase .

Free radical and antioxidant status in urban and rural population and relation with obesity and body fat distribution was done by Reddy et al (1997) [22] and significant increases in plasma lipid peroxides and free radicals (superoxide anion and hydrogen peroxide), and DNA damage was indicated.

Dexter et al (2005) [9] found that there is a relation between lipid per oxidation, vitamin C and superoxide dismutase in obesity. He found a reduced level of antioxidant vitamin and superoxide dismutase was significantly low in overweight patients. This clearly proves that higher oxidant stress is associated with a reduced antioxidant status accompanying hypercholesterolemia and hypertriglyceridemia which can lead to atherosclerosis.

Beltowski et al (2000) [5] studied the effect of obesity which is mainly due to diet on peroxidation of lipids and antioxidant enzymes and stated that obesity is clearly a risk factor for atherosclerosis.

OBESITY AND DIETARY FIBER

Anderson et al (2003) [1] studied plant fiber in context with metabolism of carbohydrates and lipids. Plant fibers are ingested as parts of plant foods and are not digested by the human body. They are neglected by the people because they have no nutritional value. In the last decade, attention has been there on the plant fibers as they influence our gastrointestinal physiology. They reported that whole grains are protective against atherosclerotic CVD. Diets rich in whole grains decrease serum LDL-C and triglyceride levels and also blood pressure and increases serum HDL-C levels along with positively altering the antioxidant enzyme status. They also reported that dietary fiber prevents carbohydrate induced hypertriglyceridemia.

Fernandez et al (2001) [11] reported that by ingesting soluble fiber, a mean lowering of 9% in LDL-C can be achieved.

Slavin (2009) [19] studied the dietary fiber and body weight and found that dietary fiber intake prevents obesity, intake of fiber diet is inversely proportional to body weight and body fat, fiber intake is inversely related with BMI.

Jenkins et al (2001) [13] tested the effects of a high fiber diet on the disorder, and concluded that high fiber diet resulted in the largest reduction in LDL-C (33%+/-4%, $p<0.001$). They concluded that very high fiber intakes reduce risk factors for cardiovascular diseases. They also reported that viscous fibers are hypocholesterolemic and have been associated with higher HDL-C levels and reduced incidences of cardiovascular disease.

Liu et al (2002) [15] reported that the more is the ingestion of fiber diet, lower is the risk of cardiovascular diseases and myocardial infarction.

Newby et al (2003) [17] studied dietary patterns and changes in body mass index and waist circumference in adults. Consuming a diet high in fiber was associated with smaller gains in body mass index and waist circumference. Diet rich in whole and unrefined foods contain high concentration of fibers that may be protective against chronic diseases.

Antioxidants can counteract the reactive oxygen species before free radicals arise in the body from different sources. (Singh, 2009) [20]

AIMS AND OBJECTIVES

- To study classification of the subjects according to various anthropometric parameters.
- To study prevalence of Total, boys and girls according to age.
- To study antioxidant enzyme status in total subjects, boys and girls before and after fiber diet.
- To study anthropometric parameters in total subjects, boys and girls with statistical evaluation before and after fiber diet.
- To study average anthropometric characteristics in total subjects, boys and girls according to age.
- Study of antioxidant profile in relation to fiber diet.
- Relation between anthropometric parameters and fiber diet.

MATERIAL AND METHOD

The present study includes anthropometry and a clinical study with fiber diet in 100 students aged between 18 to 30 years to evaluate and establish the correlation between anthropometric parameters, antioxidant enzyme before and after fiber diet. The practical work was done in Department of Biochemistry, PMCH, Udaipur

SELECTION OF GIRLS FOR THE STUDY

This study was conducted on 100 students living in different institutional hostels from different states; they were randomly selected irrespective of their caste and creed. The subjects with any clinical evidence of liver, kidney or endocrine disease and those on treatment that would affect the metabolism of lipid were not included in the study.

Normal subjects of same age group with that of respective obese group acted as control.

(1) Skin fold thickness:

The instrument used was Harpenden skin fold caliper.

(2) Total Body Fat Percent:

Total body fat percent was calculated using the following formula: (Young men Christian association)[19,20,]

$$\text{Body Fat \%} = \frac{-76.76+4.15 \times \text{Waist} - 0.082 \times \text{Weight} \times 100}{\text{Weight}}$$

(3) Body Fat:

Body Fat: Multiply body weight (kg) with body fat percentage.

(4) Lean Body Mass (LBM):

Lean Body Mass (LBM): Subtract the body fat (kg) from total body weight [21].

Fiber Diet

Every individual in each group was told to replace the wheat chapatti by fiber diet for one month.

COLLECTION OF BLOOD SAMPLES

The venous blood samples were analyzed for different parameters before and after fiber diet. Haemolysate was prepared.

ANALYSIS OF BLOOD FOR SOD

Superoxide Dismutase (SOD) (Randox kit method) (Wollians et al, 1983) [24]

The role of superoxide dismutase is to increase the dismutation of the toxic superoxide radical (O^{2-}), which was formed by oxidative processes, and convert to hydrogen peroxide and molecular oxygen. This method uses xanthine and xanthine oxidase to generate superoxide radical which reacts with 2, 4 iodo phenyl 3.4 nitrophenyl 5 phenyl tetrazolium chlorides (I.N.T) to form a red formazen dye. The superoxide dismutase activity is then measured by the degree of inhibition of this reaction.

$$\text{Xanthine} \xrightarrow{XOD} \text{Uric acid} + O_2^-$$

$$\text{I.N.T.} \xrightarrow{O_2} \text{Formazen dye}$$

$$\text{Or } O_2^- + O_2^- + 2H+ + SOD \longrightarrow O_2 + H_2O_2$$

Calculations:

$$\frac{A2 - A1}{3} = \Delta A/\text{min of standard or sample}$$

All standard rates and diluted sample rates must be converted into percentages of the sample diluent rate and subtracted from 100% to give a % inhibition.

$$100 - \frac{(\Delta A \text{ Std/min} * 100)}{(\Delta S1/\text{min})} = \% \text{ inhibition}$$

$$100 - \frac{(\Delta A \text{ Sample/min} * 100)}{(\Delta S1/\text{min})} = \% \text{ inhibition}$$

Plot percent inhibition for each standard, against log10. Use % inhibition of sample to obtain units of SOD from standard curve.

SOD units/ml of whole blood = SOD units/ml from standard curve * dilution factor

Converting to SOD units/gm Hemoglobin = (SOD Units/ml) / (g Hemoglobin)

The activity of SOD expressed in enzyme unit. (EU)

Normal range: 1000-1600 U/gm Hb.

STATISTICALANALYSIS

1. Mean (X) = $\frac{\text{Sum of observations}}{\text{Total No. of cases}}$

2. Standard Deviation (S.D) = $\sqrt{\frac{\text{Sum +square of term-(mean)}^2}{n-1}}$
   n=number of obs.

3. Students "t" test:
   $T = \frac{\text{Mean 1-Mean 2}}{\text{SED}}$

4. $SED = \sqrt{((SE1 \times SE1) + (SE2 \times SE2)}$

Now P value was determined. P value if more than 0.05; it is not significant, if it was less than 0.05 then it is significant. SPSS software was used for statistical data.

DISCUSSION

The WHO has drawn attention to fact that obesity is our modern non communicable "epidemic" that is, disease that affects population not an unavoidable attribute of aging [11].

Our results were in agreement with those of Kuno et al [14] who found decreased levels in girls, Decri, [8] who found decreased levels in boys.

Vincet [23] concluded a high activity of SOD; the variation or discrepancy between our results and those of Vincet is because of obesity duration. In the early days of obesity, antioxidant enzyme activity could be increased. But if it persists for longer, the sources of antioxidant enzyme become less or exhausted, which can result in low level of enzyme activity which we found in our study.

All these reports are in accordance with the present study where antioxidant enzyme showed low acceptable ranges when matched against high body mass index, waist circumference, waist hip ratio, blood pressure, body fat percent and showed high acceptable values against low and normal weight category along with normal body mass index and waist hip ratio. There was a positive effect of the diet on the status of antioxidant enzyme in all the categories. SOD, showed increased levels in category of WHR after the diet was taken (1354.43 U/gmHb v/s 1357.25 U/gmHb;

All these results indicate that fiber helps control weight and related parameters like body mass index, waist hip ratio, body fat percent, which indirectly improves antioxidants status of

the individuals which is in accordance with our observations and results.

RESULTS

There was not much variation seen for the anthropometric parameters for age, inhabitance and socio economic status. Although waist circumference, total body fat percent and total body fat were higher in urban girls than rural girls.SOD improved with the diet although the change was not significant. The level of enzymatic antioxidants decreased with increasing age. SOD was 1329.64U/gmHb for age <20 and 1304.29U/gmHb for age >20;

SUMMARY AND CONCLUSION

We distributed the total subjects into two groups, boys and girls, to find out the prevalence according to different categories 52 were boys and 48 were girls, in the second part of the study they were examined for antioxidant status; the parameter selected to evaluate antioxidant profile parameters was superoxide dismutase

1. The level of enzymatic antioxidants decreased with increasing age. SOD was 1329.64U/gmHb for age <20 and 1304.29U/gmHb for age >20;
2. SOD showed decreasing trend with increasing TBF% (1365 U/gmHb v/s 1125.76 U/gmHb).
3. SOD improved with the diet although the change was not significant.

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Research Paper

Knowledge, Attitude and Practices Towards Prevention of Dental Caries Among Dentists in Udaipur, Rajasthan

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ABSTRACT

Background: Dental caries are considered to be the most important global oral health burden. The distribution and severity of oral diseases can be reduced largely if the preventive dentistry is practiced well, which include practices and procedures that ensure dental diseases do not occur or progress to more severe form. As an acknowledged role of dentists in prevention of dental diseases there is scarcity of data on attitudes, practices and knowledge towards preventive dentistry. Thus this study was carried out with an aim to assess the knowledge, attitude and practices towards prevention of dental caries among dentists in Udaipur.

Methods: The questionnaire based study was carried out among 118 Dentists to record the respondents' attitudes, practices and knowledge towards preventive dentistry and scores were given to the responses. Data was entered coded and analyzed using SPSS version 19. Descriptive statistics to note trends and patterns was done by way of percentages, means and range. Interrelationship between variables was analyzed using the Chi square statistic.

Results: The results suggested that the knowledge regarding oral hygiene was adequate. Most of dentists have positive attitude towards prevention of dental caries and many of them implement the procedures for prevention of dental diseases like diet counseling, fluoride tooth pastes prescription, fluoride application, etc.

Conclusion: Thus, this study is a positive indication that the dentists are willing to become involved in preventive care and hence betterment of oral health.

Keywords: Preventive Dentistry, Questionnaire, Dental Diseases

INTRODUCTION

Despite great achievements in oral health of populations globally, problems still remain in many communities all over the world - particularly among under-privileged groups in developed and developing countries. Dental caries and periodontal diseases have historically been considered the most important global oral health burdens. At present, the distribution and severity of oral diseases vary among different parts of the world and within the same country or region. The significant role of socio-behavioral and environmental factors in oral disease and health is evidenced in an extensive number of epidemiological surveys. Dental caries is still a major oral health problem in most industrialized countries, affecting 60-90% of schoolchildren and the vast majority of adults. In many developing countries, access to oral health services is limited and teeth are often left untreated or are extracted because of pain or discomfort.[1] All these diseases can be reduced largely if the preventive dentistry is practiced well. Prevention of oral diseases can be easily achieved if they are diagnosed at early stages. Hence preventive dentistry can be very useful in decreasing burden of oral and dental diseases. Preventive

dentistry is an aspect of dentistry which concentrates on practices and procedures that ensure dental diseases do not occur or progress to more severe form.[2] It includes two aspects of dental care, both performed to help patients avoid dental disease or to target them in their early more treatable stages. In part, it is the oral hygiene care performed by the patient at home. Preventive dentistry also encompasses what is done by the dental staff in the clinic to help patients maintain their oral health. In either case, the objective is to stop the development of oral disease or to find it at an early stage. Dental health professionals most often look for early signs of periodontal disease, dental caries and other changes in the oral soft tissue that could lead to oral pathology. Studies also show that scaling and polishing reduces greatly the occurrence and severity of periodontal diseases. This is due to the removal of calculus which is plaque retentive the main cause of periodontal diseases. Both community water fluoridation [known as systemic or pre-eruptive fluoride] and topical fluoridation [also known as post-eruptive fluoride] have proven to be an important mechanism in preventing dental caries in the United States since the 1950.[3] Through studies, researchers have discovered that not only has water fluoridation contributed to the decline in dental caries, but also the post-eruptive effect of fluoride has played an even more vital role in reducing dental caries.[4] Community water fluoridation has shown greatly to prevent dental caries in areas with low natural fluoride even though it could be supplemented by fluoride from other sources such as tooth paste, rinses and other topical applications in the dental office.[5] Dentists play a vital role in treatment and prevention of oral diseases. Their role in prevention is important as they are an important source of knowledge to patients. The knowledge, attitudes and practices of dentists towards preventive care may influence those of the patients. Various authors have conducted studies regarding the knowledge, attitude, practice and behavior of dental professionals towards oral health and preventive dental approach, but most of them proved to have moderate knowledge and lacked proper awareness about dental caries Gupta et al[6], Murthy et al[7]. Despite the acknowledged role of dentists in prevention of dental diseases there is scarcity of data on attitudes practices and knowledge towards preventive dentistry. Therefore by assessing the knowledge, attitude and practice among dentists in Udaipur, we tried to assess the existing knowledge gap therefore a need for improvement. This will give a clear picture towards perception of preventive dentistry. The results obtained from the study will highlight the need to apply diverse methods used in preventive dentistry and also change their attitude positively towards it. Information obtained may also be used as a reference in future related studies. Hence the objective of the study was to assess knowledge, attitude and practices towards prevention of dental caries among dentists in Udaipur, Rajasthan.

MATERIALS AND METHODS

Study Design

This was a descriptive cross sectional study as it included collection of data from the participants then followed by data analysis.

Study Area

The study was carried out among 118 Dentists in Udaipur city. This was done among those in both private and public sector in Udaipur.

STUDY POPULATION

Study population comprised of selected practicing dentists in Udaipur city.

ETHICAL CONSIDERATION

Authority to conduct the research was sought from the ethical committee of Pacific Dental College & Hospital, Udaipur. Informed consent was sought from the study participants where they obtained a written and signed consent after an explanation was given to them by the principal investigator. All information collected was treated with utmost confidentiality.

SAMPLING METHODS

Sample Size

Sample size was computed using the Raosoft sample size calculator. Margin of error was kept at 5%, confidence level of 99%, with the 142 total dentists in Udaipur city in private and public sectors and with response distribution of 50%. The final sample size was calculated as 118.

Sampling Procedure

Non probability convenience sampling was employed. A list of registered and practicing dentists from the Indian Dental Association Udaipur Branch was issued.

Inclusion Criteria

- Dentists in Udaipur both public and private sector
- Those who give their consent
- Practicing and registered Dentists

Exclusion Criteria

- Those who did not give their consent
- Dentists who were not registered

Data Collection and Technique Tools

Data Collection Methods

Data was collected via a self-administered questionnaire. The participants were practicing dentists from Udaipur city. The questionnaire was filled by subjects who meet the inclusion criteria.

QUESTIONNAIRE

The questionnaire was formulated based on previous literatures as that of Ghasemiet al[9], Khami et al[19] and was designed in English, which was validated and modifications were then made accordingly before it was finally administered[13]

Part one consisted ofinformed consent and demographic information ofthe respondents such as age, gender, practice experience, level of education and type of specialty. Second part focused on the knowledge on prevention of dental caries

among the participants, where they were asked to react to fourteen statements regarding various aspects of caries diagnosis and prevention[9, 13, 19]. Third portion described their perception towards general meaning of prevention of dental caries. A seven-point semantic differential scale of various qualities and their opposites was used to record the respondents' attitudes towards preventive dentistry. Scores were given to the responses (from one to seven, with the higher scores for the more favorable attitudes)[20]. Fourth part assessed the level of practice on prevention of caries among these participants.

STATISTICALANALYSIS

Data was entered coded and analyzed using SPSS version 19. Descriptive statistics to note trends and patterns was done by way of percentages, means and range. Interrelationship between variables was analyzed using the Chi square statistic.

RESULTS

The total respondents who revert back with the questionnaire were 126, of which 71.4% were male and 28.6% were females. 50% of participants were 23-30 years of age, 42.06% were in 31-40 year age group. About 47.6% of the practicing respondents had less than 5 years of work experience, 34.1% had 5-10 years of experience. Among these 54.8% own their dental clinics while remaining were employed by the university or ministry of defense. 61.9% of our subjects had completed their post-graduation, 38.75% were undergraduate. (table 1).

When knowledge on prevention of dental caries was evaluated, 96% participants confirmed that diet has important role in caries prevention. 59% believe that milk and cheese do not have anti-cariogenic properties. The fact regarding anti cariogenic nature of sugar substitutes was not clear among the participants; 43.7% refused to accept the fact and 42.9% accepted it. 83.3% credited fluoridation of drinking water in regions with low fluoride to be an effective way to prevent dental caries. 78.6% respondents think that application of fluoride varnish every six months is effective in caries prevention. Chlorhexidine mouth rinse effectiveness in dental caries prevention was confirmed by 51.65 of dentists. 83.3% practitioners affirmed that pit and fissure sealant is effective method for caries control. It was evoked by 59.5% of dentists that examining a newly-erupted tooth with a sharp explorer damages the enamel rods and predisposes the tooth to caries. 65.9% dentists refused to consider obesity as one of the reasons for dental caries. (table 2).

Table 3 shows the evaluation of level of attitude on prevention of dental caries among the dentists. Most positive attitudes were seen by the respondents who characterized preventive dentistry as valuable for community (5.93 ± 1.09), beneficial (5.36 ± 1.45), and reputable (5.23 ± 1.25) for dentists. The lesser positive attitudes were found for some dental faculty−related aspects, indicating that preventive dentistry is a scientific subject (5.16 ± 1.22), was not efficient (5.04 ± 1.26) and difficult for faculty to practice (5.02 ± 1.25).

Table 4 shows practices towards prevention of dental caries among dentists in Udaipur. Majority of the dentists i.e. 42.1 % give diet counseling to their patients. While only 4.8 % of the dentist always prescribe Xylitol chewing gum to their patients. 41.3 % of the dentists recommend fluoride tooth paste to their patients for prevention of dental caries. Just about 50 % of the dentists said that they only sometimes perform topical fluoride application. Only 8.7 % of the participating dentists always prefer pulp capping over root canal treatment wherever necessary.

DISCUSSION

Primary preventive strategies for oral health are an essential public health priority since dental caries is the most common chronic disease among children worldwide[8]. It is therefore necessary to begin initiatives with very young children to promote positive outcomes during childhood and subsequent adulthood. Since dentists are the persons who convey evidence-based knowledge of oral health care to public, they also influence their patients' oral health-related behavior[9]. Hence, dental professionals' attitudes toward caries prevention can impact their receptivity to training and subsequent involvement in preventive services in their future practices[10]. Various studies have been enrolled which suggest weak attitude towards practicing preventive dentistry. Gupta et al[6] conducted a study to assess the knowledge, attitude, practice and behavior of dental interns toward MID. The results of this study show that Interns exhibited adequate knowledge and positive attitude which they acquired through their undergraduate curriculum, but it failed to create positive behavior toward practicing MID.Murthy et al[7] conducted a study to test the knowledge, attitude and practice in prevention of dental caries amongst pediatricians in Bangalore, which concluded that pediatricians in Bangalore had good attitude and practices, but had moderate knowledge and lacked proper awareness about dental caries. They also compromised on providing good preventive dental care to the community. Hence, this study is performed to grade the knowledge and attitude of preventive dental practices among the dentists in Udaipur. A questionnaire based descriptive cross sectional study was conducted among all the dentist of Udaipur including both private and public sector dental clinics.

The results of this work revealed that most of the dental practitioners in Udaipur City are by and large aware of the role of diet, sugar, sealants, and fluoride in various forms (water fluoridation, dentrifices and fluoride varnish) in prevention of dental caries. Majority of them are also cognizant that sealants are quite effective in prevention of dental decay. This fact was in agreement with the studies conducted in past in various regions including Ghasemiet al[9], Agarwal et al[11], Sharda et al[12] and Ahuja et al[13]. Mirzaet al[14] and Lin et al[15] also state that their respondents were well aware about the preventive roles of pit and fissure sealants and fluoride in various forms, in forbidding dental decay. Chlorhexidine digluconate (CHX) is generally considered gold standard as an antiplaque agent, but being controversial, its use as a caries preventive agent remains questionable in this study. Only 51% confirmed it as caries preventive agent, others either refused or were not clear regarding its caries control property. Our findings were similar to that of Autio Gold J[10]and Agarwalet al[11], but contradictory to that of Patil et al[18]. Also Caufieldet al[17] performed a systematic review and found that the evidence for using Chlorhexidine looked promising but incomplete. So there is a need for further

research to evaluate the caries-preventive effect of Chlorhexidine. As a well-known fact, caries activity tests are useful for evaluating degree of risk to develop dental decay, for identifying etiological factor, for determining intensity of treatment and in planning preventive program, most of Udaipur dentists (80%) were also aware of importance of caries activity tests in educating and motivating patients in maintaining good oral health and hence caries prevention. This was in accordance with Agarwalet al[11], Autio gold et al[10] and Fiset et al[16]. On the other hand, deficiencies were evident in the dentists' knowledge of the role of fluoride in caries prevention and of some aspects of caries initiation and progression. They were also unaware of obesity as a risk factor in dental decay and whether sugar substitutes are anti-cariogenic.

Attitudes are molded by beliefs and values, personal needs, and behavior[9]. Evaluation of attitude towards prevention of dental caries among these dentists showed positive attitudes toward preventive dentistry, characterized as being essential, efficient, useful, and valuable. Preventive practice was not easy to practice and was less attractive for these practitioners. Ghasemiet al[9], Khami et al[19] and Ahuja et al[13] also had similar attitude in towards preventive practice among their respondents. Participants of present study found preventive practices reputable for their profession. This attitude does not match with those in the study performed by Ahuja et al, where the dentists considered such practice disreputable personally[13]. Thus it is a positive indication that they are willing to become involved in preventive care.

These attitudes may originate due to lack of importance given to prevention during their training and education and due to perceived barriers in their practice as inadequate compensation, time limitation because of high demand for curative care, and unwillingness of patients to pay for prevention[9,13].

As most dentists are well aware of importance of prevention in dentistry many dentists follow various methods for dental decay prevention. Most of them prescribe fluoride dentrifices and Chlorhexidine mouth rinses to their patients on regular basis. They also perform topical fluoride applications and use pit and fissure sealants for caries prevention. Most of dentists asserted that they give diet counseling to their patients. Sometimes Xylitol chewing gums are also recommended by practitioners for caries control because of its anti- cariogenic properties. Pulp capping for caries prevention is also performed by some dentists. These findings were in accordance with those reported by Agarwal et al[11].

CONCLUSION AND RECOMMENDATIONS

Thus, to meet the demand for producing highly competent dental faculty, more evidence−based program on prevention should be integrated into dental education during graduation as well as post-graduation and emphasis should be placed on continuing education courses for dental faculties.

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TABLE - 1 Demographic Detail of the Participants

CHARACTERISTICS	CATEGORY	NO. OF RESPONDANTS	PERCENTAGE
Gender	Male	90	***71.4 %***
	Female	36	28.6 %
Age	23-30 years	63	50 %
	31-40 years	53	***42.06 %***
	41-50 years	10	7.94 %
Years of Practice	< 5 years	60	***47.6 %***
	Between 5-10 years	43	34.1 %
	Between 10-15 years	14	11.1 %
	>15 years	09	7.1 %
Type of Practice	Private clinic	69	***54.8 %***
	Public	05	4 %
	Employed by University	50	38.7 %
	Employed by Ministry of Defense (Army)	02	1.6 %
Highest Level of Education Achieved	UG	50	38.75 %
	PG	78	***61.90 %***
	PHD	01	0.8 %
Type of Specialty (if PG)	Pedodontics and Orthodontics	17	***21.5 %***
	Periodontics	07	8.9 %
	Oral Surgery	08	10.1 %
	Prosthodontics	11	13.9 %
	OP & OM	15	19 %
	Cons & Endo	15	19 %
	PHD	03	3.8 %

Table 2 – Level of Knowledge on Prevention of Dental Caries among Dentists in Udaipur

S.No.	Aspect of Knowledge	Yes n (%)	No n (%)	I don't Know n (%)
1.	Diet plays an important role in prevention of dental caries.	121 (96)	3 (2.4)	2(1.6)
2.	The frequency of sugar consumption plays a greater role in producing caries than does the total amount of sugar consumed.	114 (90.5)	6 (4.8)	6 (4.8)
3.	Consuming sugar rich food at mealtime rather than alone decreases dental caries.	92 (73)	22 (17.5)	12 (19.5)
4.	Milk and cheese are anti-cariogenic in nature.	52 (41.3)	59 (46.8)	15 (11.9)
5.	Sugar substitute reduces caries.	54 (42.9)	55 (43.7)	17 (13.5)
6.	Fluoridation of drinking water in regions with low fluoride is an effective, safe, and efficient way to prevent dental caries.	105 (83.3)	15 (11.9)	6 (4.8)
7.	Brushing teeth with fluoride toothpaste can inhibit demineralization and enhance remineralization.	98 (77.8)	15 (11.9)	13 (10.3)
8.	Fluoride varnish application in every six months is effective in preventing caries in primary and permanent dentition.	99 (78.6)	12 (9.5)	15 (11.9)
9.	Sugar substitute suppresses the growth of acidogenic bacteria in dental plaque.	75 (59.5)	29 (23)	22 (17.5)
10.	Chlorhexidine mouth rinse is effective in dental caries prevention.	65 (51.6)	49 (38.9)	12 (9.5)
11.	Sealant is effective in the prevention of pit and fissure caries in newly-erupted molars.	105 (83.3)	14 (11.1)	7 (5.6)
12.	Examining a newly-erupted tooth with a sharp explorer will damage enamel rods and predispose the tooth to caries.	75 (59.5)	24 (19)	27 (21.4)
13.	Caries activity tests are useful in educating and motivating patients in maintaining good oral Hygiene.	100 (79.4)	14 (11.1)	12 (9.5)
14.	Obesity is one of the reasons for dental caries.	20 (15.9)	83 (65.9)	23 (18.3)

Table 3 – Levels of Attitude on Prevention of Dental Caries among Dentists in Udaipur

S.No.	Pairs of Bipolar Adjectives	Mean ± SD*
1.	Unscientific / Scientific Subject	
2.	Not Efficient / Efficient Practice for Dentists	5.04 ± 1.27
3.	Difficult / Easy for Dentists	5.02 ± 1.25
4.	Not Attractive / Attractive for Dentists	4.73 ± 1.45
5.	Costly / Beneficial for Dentists	5.36 ± 1.45
6.	Disreputable / Reputable for Dentists	5.23 ± 1.25
7.	Worthless / Valuable for the Community	5.93 ± 1.09

***SD = Standard Deviation**

Table 4 – Practices towards Prevention of Dental Caries among Dentists in Udaipur

S.No.	Practices	Never n (%)	Rarely n (%)	Sometimes n (%)	Very Often n (%)	Always n (%)
1.	Diet Counseling	7 (5.6)	22 (17.5)	28 (22.2)	***53 (42.1)***	16 (12.7)
2.	Prescribe Xylitol Chewing Gum	17 (13.5)	29 (23)	***52 (41.3)***	22 (17.5)	6 (4.8)
3.	Recommend Fluoride Tooth Paste	4 (3.2)	13 (10.3)	33 (26.2)	24 (19)	***52 (41.3)***
4.	Recommend Fluoride Tablets / Topical Fluorides	13 (10.3)	12 (9.5)	38 (30.2)	***55 (43.7)***	8 (6.3)
5.	Fluoride Varnish Application	10 (7.9)	25 (19.8)	***64 (50.8)***	21 (16.7)	6 (4.8)
6.	Advice Chlorhexidine / Listerine Mouthwash	23 (18.3)	9 (7.1)	***57 (45.2)***	23 (18.3)	14 (11.1)
7.	Prefer Pulp Capping	15 (11.9)	17 (13.5)	***61 (48.4)***	22 (17.5)	11 (8.7)
8.	Pit and Fissure Sealants	5 (4)	18 (14.3)	33 (26.2)	***50 (39.7)***	20 (15.9)
9.	Recalled Reinforcement	6 (4.8)	12 (9.5)	25 (19.8)	23 (18.3)	***60 (47.6)***

Research Paper

An Analytical Study of Stress in Doctors Working in MCGM Hospitals in Mumbai

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ABSTRACT

Affordable mass services for is the primary goal of Indian government. The city of Mumbai being the financial capital of India is densely populated city in India. Mumbai government hospitals provide health care facilities for the common man in Mumbai. These hospitals are called MCGM hospitals. Doctor is a life saver angel for patients. Doctor`s occupation is incredibly challenging. The major challenge is availability of number of hospitals, and number of patients to be treated. This challenging profession leads to stress among doctors. This paper discusses concept of stress. It further analyses stress among doctors in MCGM hospitals with the help of focused group discussions. Finally, it suggests strategies to manage stress among MCGM doctors.

Keywords : Stress, Doctor, health care, MCGM hospital

INTRODUCTION

Stress is a common human feeling and an unavoidable part of human lives. It is a standard reaction to difficult circumstances or an uncertain situation. It turns into a problem when situational demands exceed an individual's adaptation ability. Stress management is the initiative of various efforts to control and reduce the tension that occurs in stressful situations. Stress management involves making emotional and physical changes. Medical profession accounts for the health of the people. If the profession is unhealthy, the question will be raised on the quality of the treatments offered to the people and its pattern. Thus stress can be termed as the physiological and psychological stage where individual cannot cope up with the demands due to the limitations of resources and mental state.

The presence of stress is perceived on the basis of its intensity and impact on the performance of an employee in the organization. Today, numerous circumstances or occasions that don't require a physical reaction trigger stress reaction, including social, intellectual and recreational ones. These external circumstances or occasions are called stressors. Stress is not the outside pressure; it is a human reaction to the surroundings.

Stress is not bad but excessive stress always leads to critical problems for the organizations in terms of burnouts, accidents, suicides, lack of performance and dehumanization at work place. Stress can be caused by external factors i.e. environmental, internal factors i.e. personal and on professional levels.

Stress is a resultant of the happenings or settings of the workplace. Following are the workplace factors (job stressors) which can result in stress:

- Occupational demands (work overload, role ambiguity, lack of task control)

- Administrative factors (biased management practices, poor interpersonal relations)
- Financial factors (unconvincing work – payment balance)
- Conflicting work – life balance
- Training and career growth issues (lack of opportunity for promotion or growth)
- Poor organizational culture (contradictory communication styles, absence of managerial commitments to core values)

Stressors may vary in different health care occupations and also within the occupation, depending on the nature of the job.

The stress lists both negative as well as positive changes that elicit stress. This can include a major events in one's life like marriage, birth or death, firing from job, increase work pressure etc.

DEFINITION OF STRESS

Stress is the physical response of the human body that equips a person to meet life's difficult situations and helps to bounce back. This "fight or flight" reaction is acquired from the "cave man" who needed to battle wild mammoths or escape from physical dangers to survive.

According to Jit, S. Chandan, (1995), "Stress is a state of mind which reflects certain biochemical reactions in the human body and is projected by a sense of anxiety, tension and depression and is caused by such demands by the environmental forces or internal factors that cannot be met by the resources available to the person." Whereas according to Shahsavarani, et al, (2015), "Any effect of change in surrounding environment on living being which results in disruption of homeostasis (internal balance) of that living being is called stress."

REVIEW OF LITERATURE

The concept of stress and job stress, particularly, has targeted everyone and so has gained substantial attention. Stress today is a part of life, and so it is unavoidable (Nayak, 2008). According to researcher Olson, "a state that is caused due to real or apparent demands which requires adjustment behaviour is called stress" (Olson et al., 1989). In common, terms stress can be described as a psychological and biological process experienced by an individual while dealing with the surrounding intimidations. Occupational stress is the psychological and biological implications of negative connections amid workplace demands and one's skills, knowledge, or expectations (Malek M. et. al., 2011).

N K Saini et al (2010) studied stress among resident doctors of the medical colleges of Delhi. It was found that the most important sources of stress for the residents were lack of sleep, long working hours, work overload, financial conditions and academic work pressure. Whereas the factors that were associated with the stress included marital status, presence of children, academic year, type of specialization and department. It was suggested to undertake coping mechanisms so as to handle the various stressors and its sources. The stress level seems to be directly proportional to their workload. Some of the identified stressors were Work condition, Sleep deprivation, Role overload, Relation with peers and night shifts. However if coping mechanisms are provided to the junior doctors, they can be in a better position to handle stress (Jayant D Deshpande et al, 2013). The paper by Dola Saha et al (2011), assesses job stress among healthcare staff of a super specialty hospital. It was noted that low income, work load, insufficient resources and emotional exhaustion are the main sources of stress. It was necessary to implement stress management strategies in order to enhance the work performance and job satisfaction. Irfana Rashid et al (2015) studied the effect demographics and work environment can have on the occupational stress and coping strategies of doctors working in government hospitals of India. It was noted in the study that female doctors were comparatively more stressed than the male doctors. Besides, doctors without proper working conditions and infrastructure experienced more stress. For the doctors, the quantum of stress and work load also differs as per their specialization and experience. The results majorly showed the doctors opting for defensive copying mechanisms rather than imperceptive styles.

In another study led by Hussain & Singh (2002), the role stress was studied among 150 doctors, who were specialists as Surgeons, Gynaecologists and Ophthalmologists from Aligarh city's nursing homes and private hospitals. The result of this study showed that the surgeons or the gynaecologists scored considerably high than Ophthalmologists on identified stress effects. Thus, they concluded that the surgery or operation increases the level of stress for gynaecologists and surgeons both. Sandeep Grover et al (2020) studied the problems both psychological and burnout that the medical professionals face. The respondents worked at a tertiary hospital in North India. Most common stressors that were identified were long working hours, interpersonal interactions and doctor-patient relationship. These resulted in stress, burnout and depression among the doctors. The study by Mrs. B. Prasila Leelavathy Pappathy et al, (2016) was done with the aim to manage the effects of occupational stress among doctors. In this study, doctors working in government, private and other health services are taken as population. It was observed that doctors across all the hospitals experienced occupational stress. The stress varied with factors such as marital status, presence of children, experience, age of the doctors, income and financial conditions and family support system. It was concluded that the hospitals need to address the issue of occupational stress and provide the necessary support for the same. While studying the stress among the doctors in India in the government hospitals it is observed by Irfana Baba (2012) that the stress among doctors is very high in the government hospitals. The factors of Inter Role Distance (IRD) stressor and resource inadequacy contribute more to the Organizational Role Stress. One of the major conclusions of the paper is that male doctors feel more stressful as compared to the female doctors. The stress is also directly proportional to the number of years of service in the organization. The paper suggests few facts in the government hospitals i.e. overload among senior doctors, at the same time doctors within the age band of 22-35 scored higher on stress scores as they cannot initially balance

the organizational and non-organizational roles. They report twice in a week the night shift. They are at the learning phase and hence to gain excellence creates more stress for them.

Stress in health care professionals can stem from everyday interactions with patients having critical health issues (Maslach C, 1996) and tense interactions with associates. A lot of research is done in the performance of government/public hospitals, their working conditions and its effect on the working staff (doctors, nurses, etc.). Numerous problems were reported including work-load, inadequate resources, long waiting hours, and patient disappointment. All these factors create stress among doctors (Agdelen, Ersoz, & Sarp, 2010). High-stress levels affect doctors' mental and physical state, personal development, life quality, and goal achievement (Kaur et al., 2009). These working conditions also result in the frequent change of jobs, absenteeism, conflict among colleagues, errors and low quality work (Khawaja et al, 2004). The common work stressor for public hospital doctors is an emergency call during the surgery time, night calls or night shifts, time pressure from management and patients, day & night working, dealing with difficult patients, frustrating patient criticisms, disruption in family life, unrealistically high expectations and 24X7 responsibilities (French et al., 2001).

Doctor's involvement in teams, participation during rounds and meetings, palliative work, field trips, counselling to patients and their families, along with social services causes rise in levels of their stress. Conditions, like, poor physical working situations, overcrowding, noise, absence of good ventilation, air pollution, decreased lighting, poor ergonomics and irregular hours are found to be the contributory factors of stress.

THEORIES OF STRESS

Various theories on stress and the related concepts have been proposed over the years.

- **Fight or Flight Theory**

Walter Cannon proposed the fight or flight theory in 1915. It says that the changes that happen in the nervous system especially the brain stimulate the body. The said mobilisation of energy results in a reaction. As a result the body will either fight and overcome the situation or run away from the situation.

- **General Adaptation Syndrome Theory**

Hans Selye in 1936 developed the theory of General Adaptation Syndrome. The said theory revolved around body's reaction divided in three stages. The alarm stage where the body is alerted by the presence of stress, secondly the adaptation stage where the body tries to adapt and adjust to stress and the last stage of exhaustion where the body loses its capacity to fight. It was observed by Hans that the body's reaction is due to immediate activation of the nervous system when subjected to stress. As a result, the body has the potential to control stress and adapt accordingly. However continuous exposure to stress can cause the energy to decrease or reduce significantly.

- **Meta-Model Facet of Occupational Stress Theory**

Beehr and John Newman in 1978 developed the meta-model facet of occupational stress. This theory focussed on the workplace stress. The major facets being the environmental facets and human consequences facets. The first facet was related to the workplace stress while the latter was related to individual strain. The presence of both these factors is important to access workplace stress. It depended on personal facets, organizational facets and time facets.

- **Cognitive Appraisal Theory**

Lazarus and Folkman developed the theory of cognitive appraisal in the year 1984. This theory postulated that throughout the process of stress both the individual and environmental factors play an important role. At the centre of stress are the concepts of coping and appraisal. In the concept of appraisal, the individual assess his or her importance to the workplace and also determines individual wellbeing. Whereas the concept of coping revolves around the individual initiative to think and act so as to overcome the stress and manage the demands of the job. Thus it ascertains that an individual is said to be stressed when an individual is unable to cope with the over exceeding job demands and is not able to arbitrate stress.

- **Bio Psychosocial Model Of Stress Theory**

Bernard and Krupat in 1994 developed the bio psychosocial model of stress theory. The said model helped in assessing stress affecting biological, psychological and social systems. The model consisted of internal components, external components and the linkages between both these components. The external components comprised of the environmental factors that instigate stress like role strain, whereas the internal components comprised of the body's reaction to stress like psychological and neurological. The linkages included the transaction between the environment and individual. This theory explained in detail each component and the coping regarding all the systems.

- **Cognitive Activation Theory of Stress**

Ursin and Eriksen in 2004 developed the cognitive activation theory of stress. It involved formal and systemic analysis of psychological and physiological consequences of stress. This theory illustrated the significance between the coping of stress and the related challenges. IT mainly focussed on behaviour, physiology, cognitive and subjective experience domains. The concept of stress dampening mechanism, expectancy, coping mechanisms and potential path physiology of stress are manifested in the theory.

MCGM hospitals in Mumbai

The health care services in Mumbai are met through dispensaries and hospitals run by the Municipal Corporation of Greater Mumbai (MCGM), the private segment and the Maharashtra state. The MCGM is a civic body whose representatives the public of the city chooses. Mumbai has a decent general public-health foundation. The MCGM consists of the network of 4 medical college, 1 dental college, 16 municipal general Hospitals, 6 specialty Hospitals, 175 municipal dispensaries, 29 maternity homes, and 183 health

posts. The complex framework of MCGM is planned and designed to achieve the city's inhabitants through primitive, preventive, and curative care through established hospitals and dispensaries spread everywhere throughout the city catering the medical needs of the general population.

RESEARCH METHODOLOGY

This paper basically employs relevant literature reviews through published researched journal articles, books, conference proceedings, unpublished thesis, and monographs. The literature review examined and synthesized underlying subject aimed at identifying issues relating to qualitative research.

OBJECTIVES OF THE RESEARCH

1. To understand concept of stress.
2. To find out working culture of MCGM hospitals.
3. To know the factors affecting on stress of doctors in MCGM hospitals.
4. To suggest stress management strategies to MCGM doctors.

RESEARCH DESIGN

Qualitative focus group study is used.

Focus group discussions were held undertaken with doctors in MCGM hospitals. Focus groups were recorded and transcribed. Five focus groups were conducted with a total of 25 practicing doctors who worked in MCGM hospitals. Each group consisted of three to five doctors. Criteria for effective FGDs are summarized as a range of relevant topics, specificity and depth to direct the discussions towards the participants' experiences and the interaction of different experiences..

DISCUSSION

The focus group discussions carried out with the doctors ascertained a definite presence of stress among them. A few stressors that were pivotal included working conditions, long duty hours, stipend/income received and managing the work-life balance.

Physical infrastructure and working conditions play a crucial role to motivate employees and help them serve better especially when the doctors spend a considerable time doing their duty. A decent infrastructure facility and sound working conditions can help increase the productivity of the doctors helping them reduce stress. The physical infrastructure like lack of proper ventilated rooms, spacious hostel rooms, better canteen facilities, Air-conditioning, limited resources are a few examples of the inadequate infrastructure facilities that has an impact on the working of the doctors.

The only source of income for the doctors is the stipend that they receive from the hospital. The over-time and regular work hours per day do not leave them time for private practice or consultancy. As a result the doctors struggle hard to cope with the routine expenses. The doctors need to adapt and adjust to the changes and challenges of living in a major metro city like Mumbai.

The doctors work for long work hours and over-time work hours ending up on duty more than 14 hours per day. The very nature of their job demands them to be available 24 hours giving them less or no time for relaxation and sleep. For a normal human being to be healthy, 7 to 8 hours of undisturbed sleep is very important. Most of the said doctors work for long hours every day. Sometimes when on-call they end up spending almost 20 hours at their work place. This can result in a severe impact on the health of the doctors as their sleeping and eating patterns completely change resulting in tiredness and fatigue. Many a times the very nature of work, long work hours, erratic sleeping and eating patterns, result in fatigue and impacts the health of the doctors. The psychological impact of the work schedules results in the doctors feeling tired and vary without reason. The long hours of doctors at the work place coupled by the over-time work hours, leaves them very little time for physical activity and exercise. The doctors may then find it difficult to overcome the physical exhaustion as jogging or other exercises may demand more energy from the body. However, it can positively improve physical and mental fitness of individuals if done in the right manner.

Some of the said doctors have additional personal responsibilities (presence of spouse, children) and need to support the family back home. This leaves them with little or no room for personal commitments. They are most often unable to balance their professional and personal commitments. The stress that the doctor's experience can cause them physical and emotional harm thereby affecting their decision making and increasing the chances of them making mistakes. Most of the doctors miss their social life. Because of their hectic work schedule and their hostel stay away from home, they miss the emotional and social connect with their near and dear ones. This adds to the stress.

Besides, all the doctors follow the necessary safety protocols required while treating the patients. However, the fear of themselves being susceptible to the infections can cause a lot of stress for the doctors. This is owing to the possibility of negligence to follow safety protocols under work pressure.

CONCLUSION AND SUGGESTIONS

Stress has a powerful impact on all the individuals. So much so that in today's scenario its slowly becoming a “worldwide epidemic”. Doctors especially with their profession with the ever increasing number of patients need to actually increase their awareness of stress. Besides being able to enjoy some form of activity or the other apart from the routine job can really prove to be a stress buster for them. It is however not the responsibility of the doctors alone to beat stress but the duty of the HR department of the hospitals to function in a thoroughly professional manner.

A doctor's role in treating patients is important, but the time he spends with patients is very less compared to others. Yet, it is always the doctor who is treated as demi-god both by patients and management, forgetting others who are also serving the patient. A 360-degree change in HR approach, so that the support staff is also given the equal importance they deserve is the need of the hour. Hence the following suggestions and measures can be adopted by the doctors to help them cope with stress:

1) Relaxation: With constant physical activity there is bound to be fatigue and stress in the life of doctors. Hence any form of relaxation can prove to be extremely beneficial for them. This can include a 10-15 minutes nap in between patients, sitting quietly all alone for at least 10 minutes a day etc. Studies show that a simple form of yoga like "the pranayam" done at any time of the day but with complete devotion and dedication can be a powerful stress buster.

2) Counselling: Death, tragedy, accidents, pain, suffering etc are synonymous with the life of doctors. Talk therapy can renew their spirits. It can include a team of specialists meeting with the doctors regularly to talk about the stress and provide emotional support.

3) Activities: The research done shows the doctors are overworked and hence stressed out. At such times, using one or more of the many activities or past times, such as guided imagery, listening to music, reading, dancing, watching movies, watching television etc. can actually prove soothing for them. The emphasis here should not be on the type of activity chosen but the fact that the doctors seriously need to indulge themselves in some form of activity or the other. The most important parameter here remains that of pleasure.

4) Balanced Diet: Doctors often neglect their own health while treating their patients and thus often fall prey to diseases themselves. Besides, doctors have to attend to various casualties. As a result they fail to have routine meals on time resulting in increase stress and acidity levels. Thereby eating an appropriate amount and healthy food at a reasonable schedule and a well-balanced diet is a must for all the doctors. It shall help them to maintain the energy levels and relieve them of stress.

5) Innovative HR practices: HR in healthcare is sketchy and hence it is important to actually implement a thoroughly professional HR department in the hospitals. It will help decrease the stress levels automatically as the workplace will be increasingly people-centric. The innovative HR practices that could be implemented are as follows:

1) Celebration of birthdays of all employees by the department heads.
2) Presentations by employees after attending external training programmes for knowledge of other employees.
3) Group discussions.
4) Role plays.
5) Picnics/Outdoors
6) Recreational classes for doctors and administrative staff.
7) Training programmes.

For proper implementation of all these activities, there could be a large and spacious recreational room especially designed to cater to the needs of the doctors. Here, it is necessary to view these techniques not from the lucrative point of view but as a way of relieving stress of the doctors and diverting their minds from the routine monotony of their jobs.

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Case Report

Obsessive Compulsive Disorder Refractory to Treatment: A Case Report

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ABSTRACT

Obsessive Compulsive Disorder (OCD) is known to present with recurrent, unwanted thoughts leading to anxiety and/or repetitive compulsive behaviors, which cause significant impairment in social and occupational functioning of an individual. There are both pharmacological and non-pharmacological treatment modalities for management of OC symptoms. However, treatment response in 40-60% of subjects is found to be unsatisfactory. This case report illustrates a patient's journey of OCD and discusses the challenges faced during its management.

Keywords: OCD, treatment-resistance, non-response to treatment, resistant OCD, refractory OCD

INTRODUCTION

Obsessive Compulsive Disorder is known to be a chronic psychiatric disorder that presents with recurrent and persistent thoughts, impulses or fears (obsessions), which are unwanted and create distress or anxiety in the patient (ego-dystonic). These may be accompanied by repetitive compulsive behaviors or mentations (compulsions) in order to alleviate the anxiety. These symptoms are known to cause significant impairment in a patient's socio-occupational functioning [(1)]. The lifetime prevalence of OCD in the general population is reported to be 2.3% [(2)]. Both pharmacological and behavioral treatment modalities have been implicated in alleviation of OC symptoms. However, controlled trials with SSRIs have demonstrated selective and limited efficacy in only 40-60% of patients, with about 30% of them failing to respond to conventional treatment [(3,4)]. Prevalence of treatment-resistant cases of OCD has been estimated to be around 30% (4). Non-response to an adequate treatment trial is associated with serious morbidity and disability[(5)]. This case report describes a patient's exhausting experience with OCD and the challenges faced by mental health professionals in managing her symptoms over the years.

CASE HISTORY

A 33 years old female presented to Psychiatry OPD with complaints of insomnia, restlessness, diminished interest in household work, low mood and crying spells. On further inquiry, she revealed that she feels intolerant of any dirt, dust or unhygienic surfaces in the house and hence, spends most of her time cleaning the house furniture, walls, kitchen-ware, footwear, washrooms and clothes. She engages in this activity for >8 hours a day, leaving no room for other chores or responsibilities and ends up feeling exhausted and irritated by day end. She seems to be well aware of her over-concern for cleanliness and admits that her repetitive thoughts pertaining to contamination are illogical and unwanted. While these unwanted thoughts create anxiety, she reports an immediate sense of relief once she has cleaned the surroundings or washed her hands. This relief however, is only short-lived and the thoughts recur soon after. In a day, she washes her hands with soap up to 20-30 times. Lately, she started expecting her family

members to follow her norms of cleanliness and wash their hands regularly (proxy-compulsions). If not complied with, she would become irritable and uncomfortable.

The patient is third born of three siblings, and belongs to middle socio-economic class, with family residing in urban area. She is an Arts graduate and prefers to be a homemaker. She is married since ten years, and has two children. However, there is no worsening of symptoms secondary to additional responsibility of their up-bringing.

She has been experiencing these symptoms for about ten years, with history of gradual onset and slow progression over time. The nature of symptoms has remained more or less similar, with intermittent past history of repetitive fears of contracting infections, or a general liking for symmetry and a predilection for lucky numbers. She takes keen interest in religious activities and prays daily in her set ritualistic fashion.

There is no history of episodic mood changes, fearfulness, suspicion, muttering or use of any psychoactive substance. History of any underlying organicity or medical or surgical illness was ruled out. There was no significant contributory family history. Her pre-morbid personality comprised of an inherent liking for neatness, orderliness, cleanliness and appropriateness of work. She was a shy and obedient child, who liked being punctual and perfect with her assignments. While her mother was strict and authoritarian in parenting style, her father was more permissive and supporting. However, she experienced no significant distress or dysfunction during her childhood and adolescence. She remembers starting to feel conscious of unclean items or surfaces in the house much after she got married and moved to a new home. As the years passed by, these thoughts persisted with fluctuating severity. There is no history of significant life events or stressor in recent past. However, inadequate response to treatment received so far along with the costs endured, added to her hopelessness and worry. Increasing burden of care in family members lead to expressed emotions, further worsening her symptoms.

TREATMENT HISTORY

When the patient presented to our OPD, she had been struggling with her illness for more than eight years. Over these years, she had resorted to help from a multitude of Psychiatrists and clinical Psychologists. She reported a history of adverse effects and/ or unsatisfactory response to previously prescribed medications. These trials included Fluoxetine (100 mg/day) followed independently by Clomipramine (150 mg/day). Another treatment record mentioned a trial of Fluvoxamine (150 mg/day), augmented with Risperidone (1 mg/day).

She reported some relief in obsessions (15-20%) with Fluoxetine alone, but was not satisfied with the response. With Clomipramine, she developed complaints of dry mouth, constipation and over-sedation during the day. While Fluvoxamine and Risperidone together helped marginally with reduction in symptom severity, the response was unsatisfactory. The latest trial received was of Sertraline (100 mg/day) for 3 months with no response whatsoever.

While medication compliance was an issue in the initial few years, it was ascertained that for the last 4-5 years, the patient had adhered to her treatment regimen, with the constant help of counselors and empathetic support from family members. No behavioral intervention directed towards OC symptom reduction had been introduced in the treatment plan so far.

After conducting routine blood investigations, a complete metabolic profile of the patient including thyroid profile was checked and found to be within normal limits. Imaging of the brain (MRI scan) showed no underlying organicity. Personality assessment and serial interviews were conducted to rule out differential diagnoses of other anxiety disorders, organic mental disorders (intrusive thoughts/ stereotypes), schizotypal personality (obsessive ruminations/ magical thinking), OC personality, psychosis (intrusive thoughts/ delusions), impulse control disorders and other OC spectrum disorders.

General and systemic examination of the patient was normal. Mental status examination showed diminished psychomotor activity, reduced tone, volume and pressure of speech, depressed affect, preoccupation with symptoms and intellectual insight into illness. Her score on YBOCS (Yale Brown Obsessive Compulsive Scale) indicated severe intensity of OC symptoms. And scoring on HAM-A (Hamilton Rating Scale for Anxiety) and HAM-D (Hamilton Rating Scale for Depression) showed moderate to severe anxiety and depression, respectively.

After thorough discussion it was concluded that this was a case of refractory OCD (failure in response to 3 successive trials of SSRIs for more than 12 weeks). A combined trial of Fluvoxamine (100 mg), Risperidone (2 mg) and low dose Clomipramine (75 mg) along with behavior therapy was introduced. Behavioral interventions included Psycho-education of the patient and her family members about OCD, its treatment response and prognosis, and sessions of Exposure and Response Prevention (ERP).

This regimen was implemented for the next 10-12 weeks, including up to 20-24 cumulative hours of ERP sessions. On the on-going treatment, the symptoms of low mood, insomnia, irritability and reduced interest in work subsided slowly. While the patient tolerated the above medications and developed better insight into her illness, she still complained of recurrent obsessions of contamination followed by yielding compulsions of hand-washing. The scores on HAM-A and HAM-D reduced considerably. Improvement in YBOCS score was $< 20\%$.

At this point, administration of Electroconvulsive Therapy (ECT) was considered. After explaining the need for ECT, addressing concerns about its safety and taking informed consent, six cycles of ECT were administered over two weeks duration. Unfortunately, there was no significant improvement observed in the symptoms. Another cycle of six ECTs was repeated, only to find marginal overall improvement.

The only mode of treatment left to be explored hereafter was invasive deep brain stimulation (DBS) and/or psychosurgery. However, owing to patient's unwillingness to undergo invasive procedures, this line of management was not pursued.

DISCUSSION

Refractory OCD has always been challenging in terms of definition, diagnosis, staging and management. Guy et al defined adequacy of trial, resistance and refractoriness to treatment [6]. Trial of at least 3 SSRIs in maximum doses for at least 12 weeks is defined as adequate [7,8]. The treatment must have included use of Clomipramine and/or Behavior Therapy (minimum 20 hours of ERP). Failure to respond to the above trials, i.e. (<25% reduction in YBOCS score) will be called as resistance to treatment.

The most common reasons for treatment resistance include presence of co-morbid disorders (organic mental illness, bipolar disorder, substance use disorder or personality disorders), inadequacy of management (dose and duration of medication trial), improper compliance to treatment (psychological resistance) and psycho-social issues [9].

Literature on management of OCD states that partial response to first-line pharmacotherapy (with SSRI) should be treated by augmentation or combination strategies or use of the molecule in tandem with behavioral interventions. Proposed augmentation strategies include use of Clonazepam (0.5-5mg/day), Buspirone (10-90 mg/day), Lithium (300-600 mg/day), Risperidone (2-4 mg/day), Aripiprazole (5-10 mg/day) or Olanzapine (up to 5mg/day). Alternatively, a combination of Clomipramine (75-150 mg/day) with SSRI is also proposed. Some novel/ experimental methods proposed but not studied are, use of MAOI (Monoamine-oxidase inhibitors) or intravenous Clomipramine. Use of Lamotrigine (titrated up to 150 mg/day) or Naltrexone (mg) in resistant OCD has also been reported [10, 11]. Anecdotal cases have documented response to treatment with Agomelatine augmentation (25 mg/day) on SSRI or intravenous infusion of Ketamine (0.5 mg/kg over 40 minutes) [12,13].

While traditional psychotherapy does not seem to have a promising role, use of behavioral interventions (ERP) and/ or cognitive strategies (to explore and modify underlying beliefs) has been advocated. There is a definite role of ECT in resistant OCD complicated by severe co-morbid Depression, suicidal ideation or socio-occupational incapacitation. Recent use of rTMS (repetitive trans-cranial magnetic stimulation) has been made for treating co-morbid symptoms of Depression in severe OCD. As last resort, stereotactic psycho-surgical intervention has also been proposed, once total adequacy and ineffectiveness of trials of pharmacological and psychological interventions has been ensured [9]. However, this is not a welcome treatment option due to its associated risks (frontal lobe dysfunction, personality changes, disinhibition, or poor executive functioning) and only a moderate level of reported efficacy (50-67%) of the procedure [14].

In our case, from the above recommended modalities of treating resistant OCD, most of the feasible options were included in the treatment plan. Serial clinical assessments of the case reiterated the resistant nature of the OC symptoms longitudinally. A multimodal treatment resulted in some improvement in the overall insight, secondary depression, social and occupational functioning and attitude of the patient towards her illness. We could also motivate the family members to accept the patient with her illness and provide consistent emotional support. As we could not alleviate her symptoms to a significant extent, we educated her to accept herself with this illness, learn to live with it and work on optimizing her lifestyle, in order to reduce routine disturbances associated with the symptoms.

CONCLUSION

This case report is to bring to notice of clinicians, academicians and researchers, the highly stubborn and resistant nature of OCD in some cases. It attempts to highlight the importance of practical considerations while managing OCD, such as: early screening at primary care level to watch for juvenile onset OC symptoms, maximizing the effectiveness of the first trial of pharmacotherapy with or without behavior therapy, bearing in mind the existence of underlying co-morbidities and differential diagnoses, addressing psychosocial issues and better utilization of non-pharmacological modalities; in order to provide holistic care, achieve maximum treatment response and minimize overall psychological distress in the patient.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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Case Report

A Rare Case Report of Ellis-van Creveld Syndrome from Northern India

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SUMMARY

Ellis-Van Creveld syndrome (EVCS) or chondroectodermal dysplasia is an autosomal recessive disorder with the highest reported prevalencein Amish population. The four principal characteristic features are chondrodysplasia, polydactyly, ectodermal dysplasia and congenital heart defects. The typical oral manifestations of EVC syndromeinclude fusion of upper lip to the gingival margin, presence of multiple frenula, congenitally absent or abnormally shaped and microdontic teeth.This syndrome has rarely been reported from India. We present a young female with the syndrome and discuss this serious and potentially fatal condition.

INTRODUCTION

EVC syndrome is a skeletal dysplasia, first described by Richard Ellis and Simon-Van Creveld in 1940 who coined the term 'Chondroectodermal dysplasia'.[1]This autosomal recessive disorder is caused by mutation(s) in the EVC and EVC 2 genes located on chromosome 4p16.[2,3,4] The syndrome is most prevalent in the Amish population in Lancaster County, Pennsylvania, occurring in 1/5000 live births.[5,6]There is parental consanguinity in 30% of the cases with 7/1,000,000 prevalence outside Amish community. Globally about 300 cases have been described in literature including very few reports from India.[4,5,7]

The characteristic tetrad of EVC syndromecomprises disproportionate dwarfism with symmetric distal limb shortening, bilateral postaxial polydactyly, ectodermal dysplasia and, congenital heart malformations.[8]

Oral manifestations in EVC syndrome are remarkable andconstant. The most common finding is a fusion of the anterior portion of the upper lip to the gingival margin, microdontic teeth and enamel hypoplasia.[9]Life expectancy of patients with EVCS is determined by the presence of congenital cardiac disease and many patients die in childhood because of cardiac complications. Some patients with EVCS may be undiagnosed because of lack of awareness and proper screening. Here we report case of a 32-year female diagnosed with EVCS on the basis of characteristic dysplastic features. To the best of our knowledge this syndrome has been reported once only from North India.[11]

CASE REPORT

A 32 yearsfemale, the second child of a native nonconsanguineous couple,was referredto Endocrinology department for short stature and abnormal facies.(figure1) She had previously visited Physicians several times for leg pains, short statureand premature decaying of teeth. Her birth history, postnatal history and family history had been normal. The patient had undergone surgical correction of polydactyly in both hands at the age of 10 yrs. She attained menarche at age of 13 years and was menstruating regularly. Physical examination revealed normal intellectual function and profound short stature,(height 130

cms; Ht. SDS 5.7). The extremities were exceptionally short with evident acromelic and mesomelic dwarfism, bowing of radius and genu valgum.(figure2,3)There was wide gap between big toe and second toe [figure 3]. Ulnar aspect of both hands had scars because of surgical repair of polydactyly. Patient's fingernails were small, dystrophic with, sausage shaped fingers [figure 2].She had prominent fleshy nose and wide nasal bridge with marked dental abnormalities. Oral examination revealed small, peg shaped hypoplastic teeth, fusion of middle portion of upper lip and gingiva, bound down by multiple frenula (labiogingival attachment) [figure 4]. Agenesis of lower incisors was noted with crossbite with upper first molars. Hair and skin were normal.Postaxial polydactyly was observed in hands and feet.

Her pubertal staging was as per age (B4PH4AH+), no ambiguity of genitalia noted. Systemic examination including cardiovascular examination was normal. Her baseline investigations were suggestive of microcytic hypochromic anaemia though rest of the baseline investigations were normal. Thorough review of cardiac, respiratory and reproductivesystems was carried out and no abnormality was detected. Echocardiography was not suggestive of any interseptal or valvular abnormality. Radiographs were suggestive of bowing of radius and short stubby metacarpals [figure 5,6]

DISCUSSION

Ellis-Van Creveld Syndrome also known as chondroectodermal dysplasia is a genetic disorder with autosomal recessive inheritance caused by mutations in a novel gene on chromosome 4p16. Parental consanguinity is present in up to 30% of the cases and does not show any gender predilection[3]. In our patient parental consanguinity was not presentand there was no history of similar illness in sibling or family member.

The primary underlying defect isdysplasia of enchondral ossification affecting long tubular bones of limbs resulting in acromesomelic dwarfism.[4,5,11,12]Distal rather than proximal segment shortening differentiates EVCS from achondroplasia phenotype.The other features include polydactyly, usually bilateral postaxial hexadactyly, most often seen in upper limbs on ulnar side as seen in our patient. Our patient also had wide hands and feet, sausage shaped fingers, dysplastic fingernails, genu valgum and bowing of radius as described characteristically in patients with this syndrome.

Congenital heart malformations aredescribed in a 50-60% of patients with EVCS.The most common cardiac anomalies includeatrioventricular canal defect (AVCD),while patent ductus arteriosus, hypoplastic left heart syndrome, defects of the mitral and tricuspid valves, can also be seen; cardiac anomalies are the leading cause of decreased life-expectancy in these patients.[4,11]No cardiovascular abnormality was evident in our patient afterscreening with echocardiography. Patients who survive infancy have a normal life expectancy, the oldest living patient so far reported was of 82 years of age.[13]

Early appearance of orodental abnormalities at birth or in childhood helps in early diagnosis. Specific features include fused upper lip to gingival margin without mucobuccal fold, multiple accessory frenula, ankyloglossia, conical microdontic teeth, hypodontia, anodontia resulting in malocclusion and associated enamel hypoplasia.[12]The typical oral manifestations help in early diagnosis at birth or later during early childhood.The most commonamong them include fusion of the upper lip to the gingival margin resulting in the absence of mucobuccal fold, multiple small accessory frenula, ankyloglossia, malocclusion, conical microdontic teeth, hypodontia, anodontia(commonly the absence of permanent mandibular central and lateral incisors) and enamel hypoplasia.[6,11,14]Our patient had similar oral manifestations as already described.

Genotourinary abnormalities are seen in approximately one fourth of patients varying from nephrocalcinosis to renal agenesis.[4,12,13]Hematological abnormalities may rarely include perinatal myeloblastic leukemia or dyserythropoiesis. Confirmation of diagnosis can be done by direct sequencing for evident mutations in EVS1 and EVS2 gene but they are positive in only two third of patient. So aforementioned clinical features along with laboratory findings, radiological and cardiac imaging are sufficient to clinch diagnosis of this rare disorder especially in centers where genetic testing is not available as in our case

Ellis-Van Creveld syndrome should be differentiated fromother syndromes with overlapping features like asphyxiating thoracic dystrophy (Jeune syndrome), achondroplasia, chondroplasiapunctata, orofaciodigital syndromes and Morquio's syndrome.[12]

Management of patients with EVCS requires a multidisciplinary team including pediatric, orthopedic, orthodontic, cardiac, and possibly pulmonary care.

CONFLICTS OF INTEREST

All authors have none to declare

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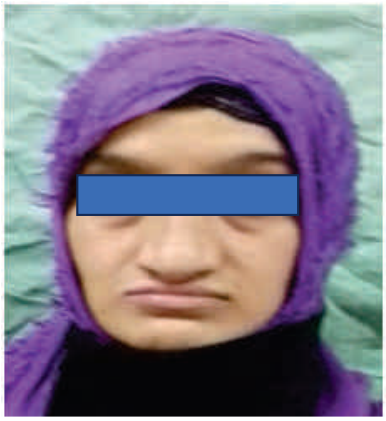

Figure1 Facial photograph

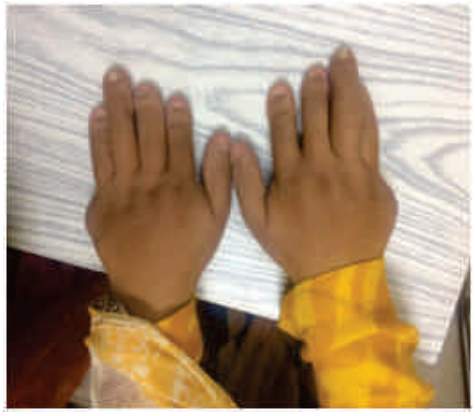

Figure 2 Postaxial polydactyly

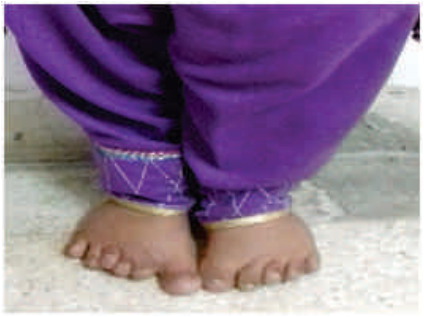

Figure 3 Polydactyly of lower limbs

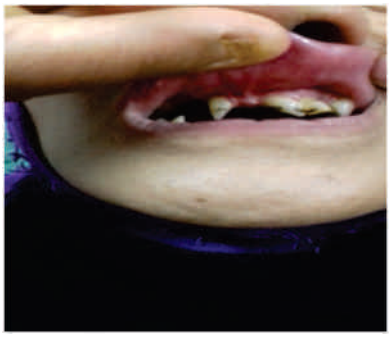

Figure 4
Multiple accessory labiogingival frenula and adontia of permanent incisors

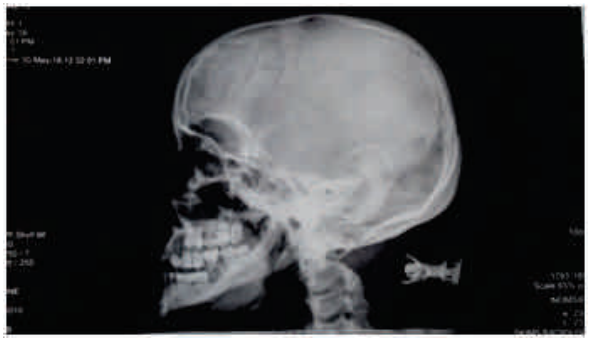

Figure 5 Radiograph showing anodontia and malocclusion of teeth

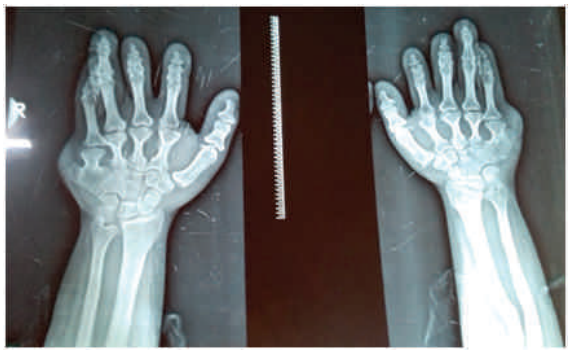

Fig 6 Radiograph of upper limb with postaxial polydactyly

Case Report

Lumber Spine Decompressive Laminectomy Surgeries In Lateral Decubitus Position And Spinal Anaesthesia

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Decompressive Laminectomy Surgery (DLS) to relieve compressed nerve roots in Lumber Spinal Canal Stenosis (LCS) is one of the most common surgical procedure performed all over world, with about 80 percent successful and satisfactory outcomes, as reported by various prospective and retrospective studies, so far. Thanks to the invention of MRI and CT imaging , the diagnosis of spinal canal stenosis is possible with certainty and this has resulted into a marked increased in spinal canal surgeries. The purpose of our Retrospective study is to compare the merits-demerits of Prone and Lateral Positioning in terms of ease and comfort in the execution of DLS. It should be noted that our study is not to compare outcome of any Conservative vs. Surgical Treatment.

In order to reduce the various potential risks associated with Prone position for spinal surgeries, we preferred the Lateral Decubitus Position, which, also allowed us the liberty to employ spinal anaesthesia. We performed decompressive laminectomy surgeries (DLS) without any bony fusion or Posterior Stabilization, except in cases where there was obvious spinal instability -Listhesis, which had the potential risk to worsen after Laminectomy alone. A Dutch surgeon , introduced the concepts of spinal canal stenosis and coined the term stenosis of the vertebral canal, in 1949. In 1954, he brought the term to the knowledge of Orthopaedicians and Neurosurgeons. Later on Kirkaldy-Willis and colleagues[8,9] worked more into the subject and did the detail study about the pathology and pathogenesis of lumbar spondylosis and stenosis[4,5,6,11,15]. Schlesinger introduced the term Lateral recess stenosis which was found in two patients [10], in 12 patients by Epstein, et al.[3] in 1972, and in 16 patients by Ciric, et al.[2] in 1980. Furthermore, Katz and coworkers [6] have shown that initial improvement last for few months and then deteriorates over time in DLS. There have been numerous retrospective studies in which the results of surgery with and without fusion have been reported. Turner, et al.[13] conducted a Metaanalysis of 74 journal articles, published from 1966 to 1990, that met the inclusion criteria. On average, 64% of patients treated surgically for LSCS had a good to excellent outcome. After reviewing 47 articles in which patient outcome after lumbar spinal fusion was reported, the same authors [2] found no advantage to using . Presenting Symptoms-In our study, symptoms associated with LSCS included: Pain in the back in 94.3% of patients with an average duration 36 months, radiating pain in the; leg seen in 98.5% of patients, average duration being 24 months; paresthesias was reported in 76.5% of patients; and difficult ambulation in 79.7% of patients. Symptoms of disc prolapse included : backache in 100% of patients, average duration 65 months; legs pain in 97.6% of patients, average duration 36.8 months; paraesthesias in 75.1% of patients; and difficulty in walking in 87% of patients. Symptoms associated with lateral recess stenosis included: Backache in 100% of patients, average duration 43months; pain in leg 95.7% of patients, for average duration 26.5 months; paraesthesia in 87.5% of patients; and difficulty walking in 65% of patients.

Clinical Examination: Straight Leg raising found positive in 58%; Sensory loss or impairment in 48.2%; Motor weakness in 34.7%; and

deep Reflex changes in 57.8% of the patients. In case of Lumbar Stenosis and Herniated Disc we noted: straight leg raising was positive in 85.2%; Sensory loss in 67.6%;Motor weakness in 58.7%; and Deep tendon Reflex changes in 56.7%, and in patients who had Lateral recess stenosis clinical signs were: Straight Leg raising positive in 89%; Sensory impairment in 58.6%; Motor weakness in 56.2%; and deep tendon Reflex changes in 54.7%.Diagnostic Investigations- Our diagnostic study is magnetic resonance imaging,and this procedure was used in all the patients included in this study.

Exclusion Criterion- In this comparative study we have excluded surgeries performed in Prone position, at level other than L4-5 and L5-S1 and, which involved the Fusion and Pedicular fixation. Surgery were not performed in obese or overweight patients.

Surgical Technique- Patient is given Spinal Anaesthesia and turned to one side-a Lateral Decubitus position, depending on the side of the disease. For Right sided Radiculopathy, Left Lateral Position and for Left sided, Right Lateral Position is utilized. Surgery is started with marking of intended level under Carm guidance. Posterior Midline incision of about 1.5-2 inch in size for one level and 2.5-3 inch size for two level Decompressive Laminectomy is usually carried out. Subperiosteal dissection on affected side is undertaken and extended laterally to expose the affected level lamina till facetal joints. Micro-scoop or curette is used to clear the area. Ligamentum flavum is curettage from under the surface of caudal and cephalic margin of adjacent upper and lower bony lamina. Kerrison Rongeur is used to carry out medial facetectomy of superior facetal joint which exposes the underlying nerve root. Then using blunt dura dissector as a protection between dura and lig. Flavum, part of the hypertrophied ligament is incised and removed using rongeur. Part of the bony lamina is also excised using burr and bone nibbler. Epidural venous bleeding is usually not much of problem. Continuous suction and Bipolar cautery is used to stop the bleeding if there is any. We rarely come to use bone wax, Surgigel or surgisilk etc. to control the oozing. Depending on the level and area of compression, more or less compressive ligament and bony tissue is excised. Nerve roots are identified and Retracted medially to expose the protruded disc, if present, to remove the offending disc material. Nerve root is cleared of all compression and/or adhesion to make sure that about 1cm of nerve root is clearly visible and seen to be entering the foramen. Most of the time we found bruised spots on nerve root, a telltale sign of chronic compression. The lower limb of the affected side is flexed and extended at hip to watch out for any tension at nerve root and to be sure of root's complete freedom from any compression or impingement. At the end, wound is irrigated with Normal Saline and closed in layers by Polyamide sutures. After 6 hours of surgery, patient is encouraged to sit up and stand up. Next day, patient is allowed to walk if pain permits. Between January 2012 and OCT 2015, 310 patients underwent surgery in Lateral Decubitus position for (A) Lumbar stenosis- L4-5 or L5-S1 (202 patients), (B)Lumbar stenosis and Herniated Dig - L4-5 or L5-S1 (61 patients), (C) Lateral recess stenosis(L4-5 or L5751 – 47 patients). The male/female ratio for each group was 51:49, 64:36, and 68:32, respectively. The average age for all groups was 62.1 years. Complications of Surgery-In 5 patients, a dural tear occurred during initial laminectomy, 3 of them required suturing at the end of surgery. 6 patients had superficial infection, which were treated successfully by sensitive Antibiotics and debridement. 15 patients had persistent Radicular pain, which reduced in intensity over 6-months period, but not resolved completely. 32 patients had lower backache, which was relieved by medication and physiotherapy. 3 patients had Foot drop (had calcified disc and excessive nerve root retraction caused the neuropraxia). 2 patients recovered completely in 3-5 months. One did not recover, who required Tendon transfer surgery. Follow-Up Evaluation -For patients with LSCS, the success rate was 87.2% at 6 weeks and 85.2% at 6 months. For patients with LSCS and herniated disc, The success rate was 86% at 6 weeks and 84.6% at 6 months. In patients with Lateral Recess Stenosis, the success rate was 70.1% at 6 weeks and 78.6% at 6 months. The success rate for patients with Lateral recess stenosis was much lower. We belive that in Lateral recess stenosis the nerve root which was compressed too much, required more healing time for recovery. In some instances, where prolapsed disc was calcified, the root manipulation was considerably more. So, the patients had sensory and motor deficit for 3-4 weeks, due to Neuropraxia.

As mentioned before, we wanted to compare the Merit and Demerit of Lumber surgery in Prone and Lateral position from our past experience, in terms of feasibility, comfort, adequate execution and time taken in the whole process of surgery, and for that matter, we had the following points to make. Prone position is accepted out of training, familiarity and experience. Additional gadgets like special Spinal Frames, Bolsters, special Spine table is needed for surgery in Prone position - but no such requirement needed for Lateral position. In Prone position- Excessive bleeding from pressure on the abdomen due to Epidural Venous Engorgement have been reported- but considerably less oozing was noticed in Lateral position. So, the requirement of Bone wax, Surgigel, Surgisilk or Haemoloketc was considerably less. Prone position is Static position and alteration in position during surgery is not possible-While, Lateral position allowed the alteration in lower limb position, like flexing the hip and knee to relax the nerve roots. Maneuvering of C ARM image intensifier is difficult and strain the surgeon in Prone position, while in Lateral position, C-arm handling is quite easy and hassle free. Disadvantages to Anaesthetist in Prone position included the universal need for General Anaesthesia, and complications like Cardio Pulmonary events - which may prove difficult to manage in this position. Disadvantages to patient in Prone position include stress on pressure points, Cervical spine strain, Pressure on Eyeball which can result rarely in blindness-In Lateral Position, pain due to pressure on arm and shoulder can make patient uncomfortable if spinal anaesthesia is used and surgery is prolonged. But this problem was not significant as most of our surgeries would finish in less than one hour.

OUR OBSERVATION AND EXPERIENCE IN 310 SPINAL SURGERIES

PERFORMED IN LATERAL DECUBITUS POSITION

1. Ease of surgery. In our experience, it was far easier to perform surgery in Lateral position as it allowed the surgeon to

sit comfortably on chair/stool and perform the procedure, rather than stand and tire himself or herself.

2. Surgery Time-our surgical time had reduced to 50 percent or less as compared to our past experience in prone decubitus position, due to virtually bloodless clear operative field and minimum oozing of epidural venous blood, thus allowing surgeon to gain time, which otherwise used to be lost in maintaining haemostasis. Minimum recorded time was 25 mins (Skin incision to Closure). Surgery never extended more than 70 mins (mostly under one hour).

3. Comfort for Assistant- It was easier for the assistant to notice the procedure and be interested in learning the proceeding as both Surgeon and Assistant have clear vision of surgical field, without straining their body.

4. Anaesthesia related issues-Anaesthetist found it easier to manage and monitor the patient in Lateral position with regards to fear of displacement of ECG Leads and Endotracheal tube. As pressure on abdomen is less, and resulting Epidural Venous Oozing at operative area is considerably reduced, there is no need for the Anaesthetist to maintain hypotension.

5. Lateral position allowed to the use of Spinal Anaesthesia, which greatly reduces the overall surgical time, by avoiding time taken for Reversal. After surgery, patient is immediately shifted out of O.T.

6. Transfer or Shifting of patient was faster and easier as Lateral position does not utilize special gadgets like Spinal Frames or Bolsters etc.

7. Field of vision at surgical area- it was quite astonishingly clear and allowed the visualization of roots, its axilla, and the telltale sign of Compression like Bruising or Laceration mark on dura of nerve roots Our end point of adequate surgery was, when we have cleared the nerve root of all the compressing tissues, like hypertrophied ligament, osteophytes, prolapsed disc material etc. and about 1 cm length of root starting at Axilla, and, then passing on to Intervertebral Foramen, is clearly visualized, and found free from all the adhesions or compressive material.

Conclusion: From my experience, I found that Open Lumber Spine Decompressive surgeries like laminotomy-Flavotomy or Laminectomy, Discectomy, Lateral root canal Decompression etc. in Lateral Decubitus position at L4-5& L5-S1 level, offers various advantages over that in Prone position. Important and most significant of that being, (1) feasibility to perform surgery in Spinal Anaesthesia, (2) Less bleeding offers safety and reduces surgery time considerably. Our minimum surgery time for Decompressive Hemilaminectomy and Disc Excision @ L5-S1, from skin incision to closure, was just 25 mins recorded, and from induction of spinal anaesthesia to shifting the patient out of theatre was noted only 38 mins. I strongly advocate performing spinal surgery in Lateral position under Spinal Anaesthesia, as a better choice in terms of safety and adequate surgical execution, over prone position.

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Case Report

Physiotherapy Effect in Reducing Pain and Improving ROM in Osteoarthritis: A Case Study

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ABSTRACT

Background: Knee arthritis is a typical form that mainly affects women. The pain compels patients not to walk or to adopt the customized gait due to pain. In this clinical case study, the patient had pain there along the medial side of the thigh & knee. This pain was extended through the posterior part of the knee joint.

Purpose: This case study intends to reduce pain with the application of efficient physiotherapy interventions. For this intent, we used different physiotherapy interventions like Kinesio-taping, manual therapy and exercises to reduce pain.

Method: Subsequent to our notice of X-ray radiography in A-P and lateral view, the patient was diagnosed with knee arthritis. In this clinical case study, we used the Visual Analog Scale (VAS) to assess the severity of pain and goniometry was used to measure knee ROM in degrees. The patient took a total of 15 sessions, initially daily as the pain subsided, the number of sessions reduced in following weeks.

Conclusion: It had been seen at the end of treatment there was a significant reduction in knee pain, improvement in patient knee ROM and gait pattern.

Keywords: Pain, knee arthritis, case study, Range of Motion (ROM), Transcutaneous Electrical Nerve Stimulation (TENS), physiotherapy rehabilitation protocols

INTRODUCTION

The study conducted by Mr. Dinesh Bhatia et al states that arthritis is a progressive joint disease, is among the top five disabling states of affairs to affect more than 1/3 of the population > 65 years of age. It is natured by joint inflammation and reparative bone response.

Hinman RS et al and Heiden T et al in their study Global statistics make known that 100 million plus population globally suffer from OA and it is one of the widest spread reasons for disability. The same is our observation of our study. A clinical case of a woman of 66 years in our study is considered.

Study of Hidden T et al, Childs JD et al, Likivainio T et al also informs that arthritis of the knee is similarly affects both men and women but more commonly it affects people among younger men (<45years) and in the elder women (>45 years).

Jain S et al and Ringdahl E et al in their study make known that about 80% of persons affected by arthritis report to have some movement restriction like waking and 20% report not being able to carry out major activities of daily livelihood.

Esser S in his study details about the anatomical features of the knee articulation and explained the phenomenon that what happens in arthritis of the knee. Articular cartilage is a Smooth fibrous connective tissue is present between bones of the knee joint. The bone is covered by articular cartilage where it comes in contact with other bones, to

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form joint. The cartilage works as a shock absorber as well as permits for even movement of the joint with no pain in a standard joint. On degrading of cartilage, it tends to be thinner and may even vanish in all situations which may lead to joint pain and difficulty in a movement like in knee joint.

The repetitive inflammatory reaction of the articular cartilage due to focal loss or wearing down of the articular cartilage is a character of Arthritis. The intent of our clinical case study on a 66-year-old woman is to reduce pain and achieve normal walking without pain.

CASE STUDY

Mrs. Gupta aged 66 years diagnosed with arthritis of the right knee. She is a teacher by profession, which made her to stand for long teaching hours. She came into our clinic with A-P and lateral radiograph. Reduction of interarticular joint space was seen in the radiograph, especially between medial condyles of femur and tibia, the commencement of consumption mainly in the medial part of the bone. The patient complained of severe pain along the medial side of the thigh & knee. This pain was extended all the way through the posterior part of the knee joint. Patello-femoral crepitus while going thorough physical evaluation. Walking was difficult with weight shifting on the right leg.

Fig.1 A-P and lateral radiograph of the right knee showing reduction of interarticular joint space, especially between medial condoyle of femur and tibia.

It had been seen in the physical assessment that the patient had leg length discrepancy. The right leg of the patient was 0.5 cm shorter than her left. Leg length discrepancy can contribute to a patient's symptoms and affect the treatment protocol. On palpation we become aware of the presence of edema around the knee, collection of adipose tissue in the medial side of the knee, weakness of the quadriceps muscle especially vastus medialis, weakness was present in ischiatic muscle and all the muscles present around the hip joint.

Kneeling, squatting, or stepping down the stairs were exacerbating her symptoms. Sitting, resting, and reclining reduce her symptoms. On being in a position for a long time, her knee became stiff. Her symptoms worsened in the humid or cold environment, and she intermittently felt as her right knee would "give out."

Physiotherapy Management

The patient took 15 sessions of physiotherapy in one month.

The protocol that was given from the first to fifth session:

The first goal of treatment was to reduce the pain:

- To reduce pain TENS (Transcutaneous Electrical Nerve Stimulation) was given for 20 minutes around the knee joint. TENS also helps in strengthening and stimulation of the quadriceps muscle especially vastus medailis muscle.
- To reduce the signs of inflammation, Laser therapy was given for15 minutes on very first session.
- Ultrasound was given over medial and posterior surface of the knee joint, 5 minutes on each surface; it helps to reduce swelling and stiffness around the knee.
- Lymphatic drainage therapy was applied for 15 minutes to get rid of the edema around the right knee joint.
- Superior-inferior and medial-lateral glide were given to mobilize the patella.
- To strengthen quadriceps muscle, isometric exercises were given.

The protocol that was given from the fifth to tenth session:

Follow the same protocol given in the first 5 sessions along

with:

- Isotonic exercises of the muscles around the knee joint were added.
- Gait training was given with progressively increasing difficulty for the patient like diagonal walking, walking with obstacles, military walk, walking on a straight line, walking on uneven ground, etc.
- Simple exercises like weight shifting, single-leg standing were given to improve the proprioception of the knee joint.
- Kinesio-taping was applied to eradicate the patient's pain while walking.

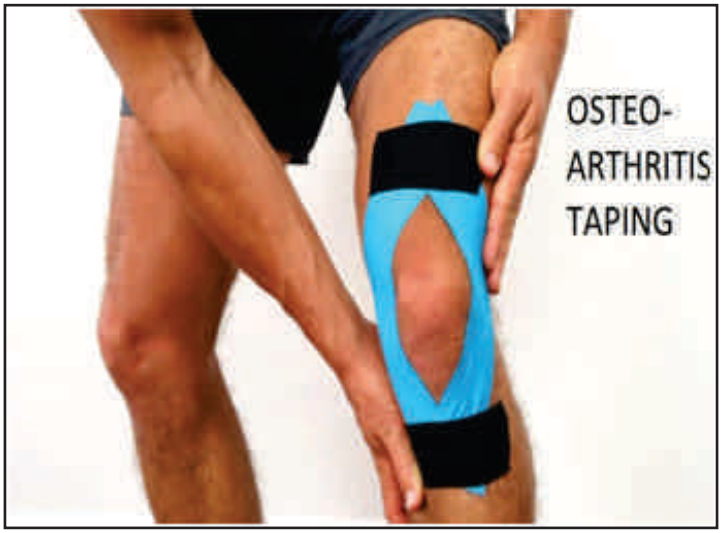

Fig. 2 Picture showing pattern of Kinesio-tapping on left knee same pattern of tapping done on Mrs .Gupta's right knee, which was applied to improve the knee joint stability, ROM, gait pattern and overall functions.

The protocol that was given from the tenth to the fifteenth session:

- Increase the intensity of the exercises given in previous sessions.
- Up and down the stairs were added to put stress on proprioceptors and to improve patient gait pattern.
- We increase the intensity of proprioceptive exercises by adding more difficult tasks like the single-leg squat, Cone pick-ups, Crossover walk, etc.
- Reeducation of walking was even more difficult with closed eyes.
- At the end of the session, Kinesio-taping was applied to improve the knee joint stability, ROM, gait pattern and overall functions.

Results

We can observe that there was a measurable reduction in pain in the first 5 sessions where VAS=6. Whilst in the second 5 sessions VAS=4 and third 5 sessions VAS =1 in the first figure. Keeping the pain scale as 10 for before the treatment, with the application of physiotherapy management we detect that the pain reduced and eliminated in the last 5 sittings.

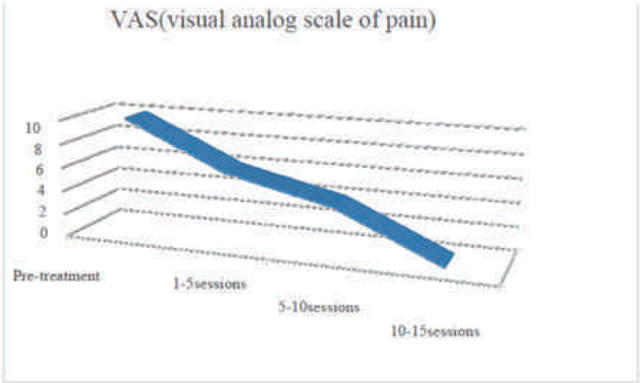

Fig. 3 showing VAS of the patient, pre-treatment VAS=10, after the initial 5 Sessions VAS=6, after the second 5 sessions VAS=4 and after the last 5 sessions VAS=1.

It's visible there was an increase in knee flexion ROM as pain eradicates with physiotherapy in the second figure. More importantly in the last five sessions, the patient regains the maximum degree of ROM of the knee joint in flexion.

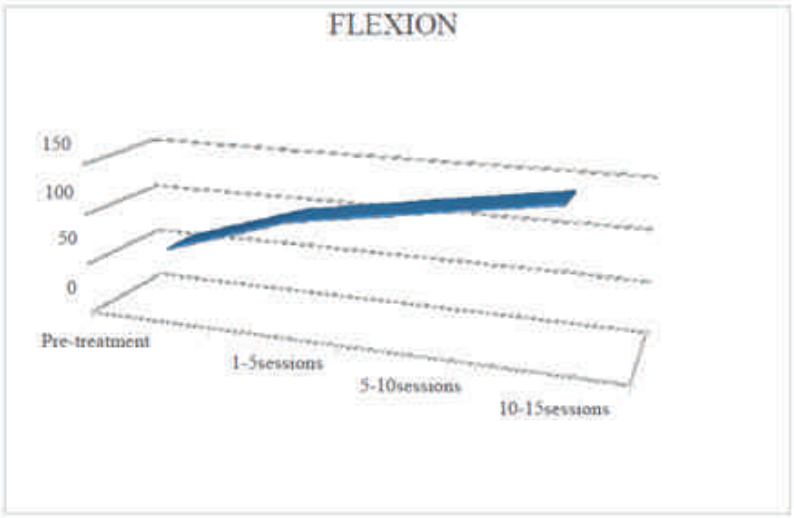

Fig.4 showing flexion ROM of the right knee joint of patient pre-treatment, after the initial 5 sessions, after the second 5 sessions, and after the last 5 sessions.

We can see there was an increase in knee extension ROM as pain eradicates with physiotherapy in the third Figure, where yet again in the last five sessions the patient achieved knee extension ROM, not though optimal but was sufficient considering the patients age.

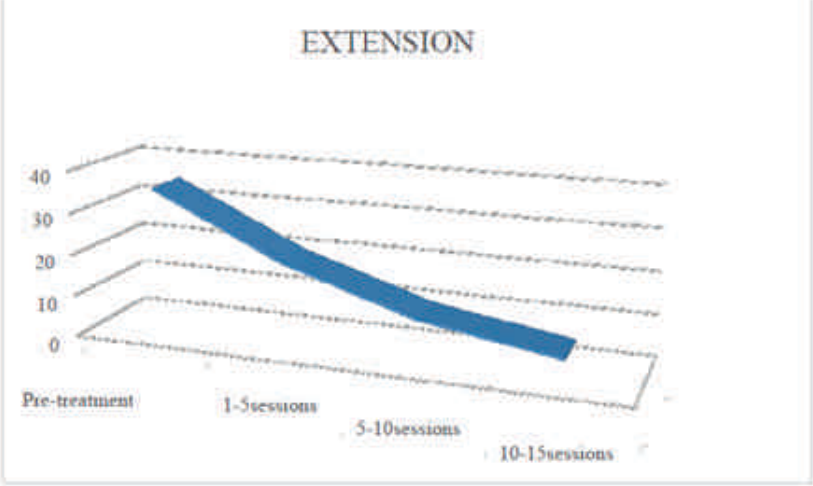

Fig.5 showing extension ROM of the right knee joint of patient pre-treatment, after the initial 5 sessions, after the second 5 sessions, and after the last 5 session

CONCLUSION

From the result, we can conclude that the application of physiotherapy is effective in relieving pain and improving gait of the subjects in the majority of the cases affected with osteoarthritis. The subject in the present clinical case study had severe pain in the right knee that made her walking difficult. At the end of the study revealed that physiotherapy is very helpful in eliminating pain and improving gait in arthritis.

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Case Report

A Morphological Study of Variations in Pattern of Calcaneal Articular Facets in Human Tali

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ABSTRACT

Aim: Aim of the present study is to know the presence and their percentages of incidences of various patterns of calcaneal articular facets in human tali.

Place of Study: Department of Anatomy of Pacific Medical College and Hospital Udaipur, Rajasthan, India

Methods and Materials: 80 unknown, dry human tali possessed from the bone sets. They were carefully examined for articular facets and classified into five groups.

Observations: The present study on human tali revealed five types articular facets .They are Type-1were observed in 21.25% (in 17 tali),similarly Type2 in 43.75% (35 tali), Type-3 in 10%(08 tali),Type-4 in 14% (06 tali),Type-5 in 17.5%(14 tali).Later they were well compared and correlated with available literatures.

Conclusion: This study on human tali has revealed the type of gait, and walking habits and weight bearing bone that has given rise to various articular facets. Hence it has been studied and reported.

Keywords: Talus, calacalneus, articular facets, weight bearing, sustenticular tali

INTRODUCTION

The skeleton of the foot, like that of the hand, consists of a closely articulated number of irregular bones, the tarsus, carrying five long bones, the metatarsus, which in their turn support the phalanges of the free digits[1].Talus is a main tarsal bone that connects bones of leg with that of bones of foot It has neither muscular attachment nor the tendinous attachment[2]. Consists of body, neck and head. The body carries a concavo-convex upper articular surface for tibia, continuous with inner and outer malleolarfacets on the sides: the outer facet, for the fibula, is longer and more vertically directed. Lower aspect of body rests, through an oblique concave articular surface, on the os calcis: internal to this and in front of it is the interosseous groove which completes the sinus tarsi, separating the articular under surface of the body from the articular head. The depth of this groove causes the constriction of the neck to be more apparent below and externally: many vascular canals mark the bone in this sulcus**1**.Talus is considered as the cornerstone of medial longitudinal arch of the foot[3].Arora et al (1979)[4], Bilodi & Agrawal (2003)[5],Bilodi AK (2006) [6], Kaur et al (2011)[7]and R. Garg et al (2013) [8],studied different patterns of articular facets of calcaneum in human tali. These authors divided talar articular facets into different types and described that differences in incidence of different types of articular facets could be due to differences in gait, built, structure of population or racial differences. Therefore, prior knowledge of articulation and various anatomical variations in articulation holds significance not only in delineating underlying pathologies but also in its treatment. Present study was conducted to

determine incidence of various types of calcaneal articulating facets in unknown human tali and correlate these findings to existing literature.

MATERIALS AND METHODS

80dries human tali of unknown sex from the Department of Anatomy of Pacific Medical College and Hospital Udaipur, Rajasthan, India constituted the materials for the present study. Each talus was carefully examined for the pattern of calcaneal articulating facets. They were classified into 5 groups. From each group, a talus was selected to mark the outline of the articulating surface carefully with the white chalk. All the five tali were numbered and photographed. Incidence of various patterns was observed and compared with available literature.

RESULTS

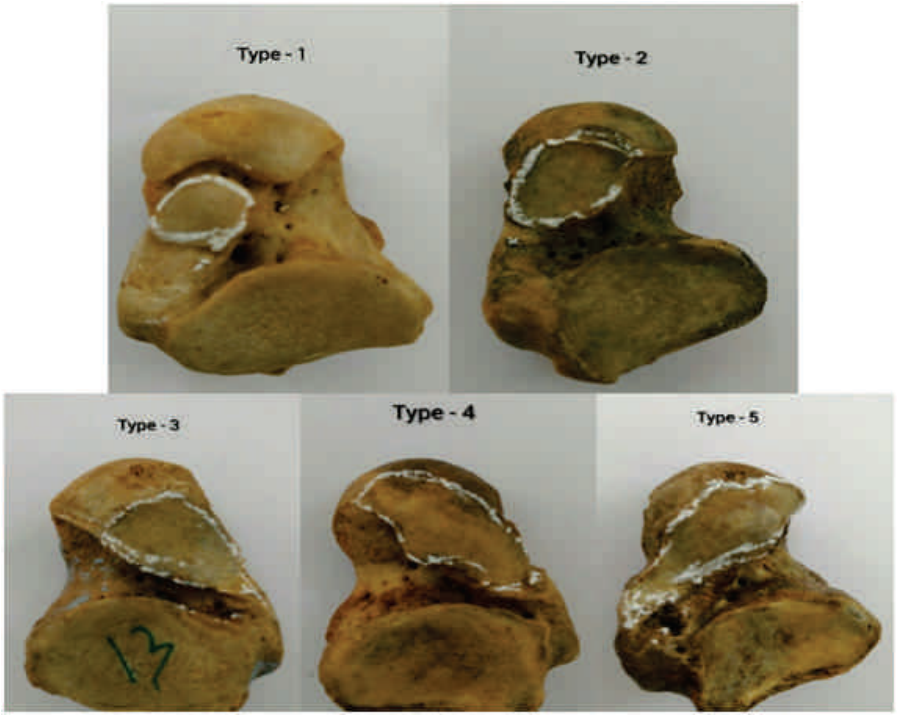
The present study showed five types of calcaneal articular facets on the plantar surfaces of heads of eighty unknown human tali according to given image. Later they were classified and tabulated in the given table below.

Various researchers have classified these facets into different types. In the present study incidence of various types of calcaneal articular facets were classified according to classification given by Arora et al (1979), Kaur et al (2011) and R. Garg et al (2013).

Table 1: Incidences and types of articulating facets-

S.No	Types of Calcaneal Articulating Facets	Number of tali which presents of this Facets	Percentages of Incidences
1	Type- 1	17	21.25%
2	Type- 2	35	43.75%
3	Type- 3	08	10%
4	Type- 4	06	7.5%
5	Type- 5	14	17.5%

Fig 1: Types of articulating facets-



From the above Table 1, it is observed that, Five types of calcaneal articular facets on the plantar surfaces in 80 human tali. 12.5% tali showed single small articular facets on their plantar surfaces (10 tali). In 33.75 % of tali showed a larger than type-1 articulating facet (27 tali). In 15% of tali showed facets partly separated by non-articular groove and ridge (12 tali). In 17% of tali showed two articular facets were separated by non-articular groove (12 tali). In 21.25% of tali showed facets on the plantar surface being continuous with facet on the body of talus. (17 tali). Later they well compared and correlated with available literatures.

DISCUSSION

The present study is well correlated with earlier workers and compared with their available data Arora et al (1979), Kaur et al (2011) and R. Garg et al (2013).

Table 2: Comparison of incidences of various types of calcanean articular facets in human tali.

S.No	Types of articular facets of calcaneum	Arora et al (1979) n= 500	Kaur et al(2011) n=100	R. Garg et al (2013) n=300	Present study n=80
1.	Type- 1	16%	45%	39%	21.25%
2.	Type- 2	78%	24%	43.7%	43.75%
3.	Type- 3	1%	9%	6%	10%
4.	Type- 4	3%	5%	5.3%	7.5%
5.	Type- 5	2%	17%	6%	17.5%

n=number of Tali

The present study was studied and observed to verify the incidence and variations in types of calcaneal facets on tali. The variations on plantar surface of the talus enable the tali to be classified according to the number and disposition of the articular facets. In the present study,the incidence of Type1 tali was 21.25% in the present series which is in agreement with the observations of Arora et al (1979) as 16%.Other researchers have reported a higher incidence of this type of tali (Table 2). Type II showed the highest incidence of 43.75%. This observation was comparable with study of Arora et al (1979) who observed incidence of Type 2 to be 78%. Kaur et al (2011) reported incidence of this type of facet to be 24% and R. Garg et al (2013) observed 43.7%. Though, much higher incidence of 78% was reported by Arora et al (1979) and much lower by Kaur et al (2011). The incidence of Type 2 tali was 43.75% in the present series which is in agreement with the observations of R. Garg et al (2013) observed 43.7%. Incidence of Type 3 tali was found to be 10% in the present study which is close to Kaur et al (2011)observed 9% and R. Garg et al (2013) reported 6%. The least common type of talus found in the present study was of type 4tali was found to be 7.5% which is close to Kaur et al (2011) observed 5% and R. Garg et al (2013) reported 5.3 %.. In the present study incidence of Type 5 tali was 17.5%, which is close to Kaur et al (2011) observed 17% whereas Arora et al (1979) found it to be 2% **(Table 2).**

Talar articular surface characteristics and sex difference was not taken in account during the present study.

Today with the aid of improvement of the technology there has been a great development of ankle prosthesis,implants, etc for the foot. Detailed anatomic information will act as a baseline for advanced treatment procedure[8]**.**

CONFLICTS OF INTEREST: None

ACKNOWLEDGMENT

Our sincere thanks go to Director of PMCH, Vice Chancellor, Principal of Pacific Medical College and Hospital, Udaipur for their great support and permitting us to perform this study.

We also thank to supportive staff of department of Anatomy, PMCH, Udaipur.

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Case Report

Management of Missing Second Premolar & First Molar with Conventional Implant

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ABSTRACT

Implant therapy is today widely regarded as a reliable treatment option to replace missing teeth, both for function & esthetics.[9] Dental implant may be used to replace single teeth or multiple teeth. This topic focuses on the placement of dental implants in lower posterior region of jaw to enhance the masticatory forces. This article describes a case report of rehabilitation of missing Mandibular[3] left second premolar & first molar using conventional implant. A 50-year-old female patient with missing teeth in left lower second premolar & first molar, reported to BHANAWAT DENTAL & COSMETIC CLINIC, Udaipur. The edentulous ridge was measured. The[2] adjacent teeth were vital, free from caries & fillings. Radiographic evaluation showed the feasibility of implant placement in the edentulous site.[2] The implant screw retained crown was used.

Keywords: Missing mandibular second premolar &first molar; Implant supported single crown; Screw retained crown.[2]

INTRODUCTION

For many years, conventional implants were considered to be the best treatment option for the replacement of missing single tooth.[8] As ideal treatment approach should be less invasive.[2]Placing dental implants in the esthetic zone is considered to be the ultimate challenge for many dentists & professionals aimed at creating an implant- supported restoration that replicated natural teeth.[7]Implant supported restorations is widely proclaimed in the literature. In addition to its high success rate, it leaves the adjacent teeth untouched. Successful use of dental implants depends on optimal conditions of peri-implant tissue around it.[2]Ideal tri-dimensional positioning of dental implants requires adequate edentulous ridge with sufficient bone thickness. In fact, it has numerous advantages, including preservation of circulation, soft tissue architecture, and hard tissue volume at the site; decreased surgical time; improved patient comfort; and accelerated recuperation.[5] It offers the potential for higher passivity placement of the crown.[3]

CASE REPORT

A 50 years old female patient reported to Bhanawat Dental & Cosmetic Clinic with chief complaint of mobile teeth in left lower back region of jaw since 2 years because of that she was having difficulty in chewing food. The first treatment step was careful extraction of lower left second premolar and first molar. The adjacent teeth were vital, free from caries and fillings with a suitable crown volume and height.[3] On clinical examination, we planned implant placement in posterior region. All routine blood investigations were prescribed which were normal with negative HIV, HbsAg and HCV.Radiographic evaluation cone beam computed tomography (CBCT) showed the feasibility of implant placement in edentulous site.[3] Bone height from crest of alveolar bone to mandibular canal in second premolar region is 12.4mm and width 7.2mm. So, we planned 4x10mm osstem implant & in first molar region

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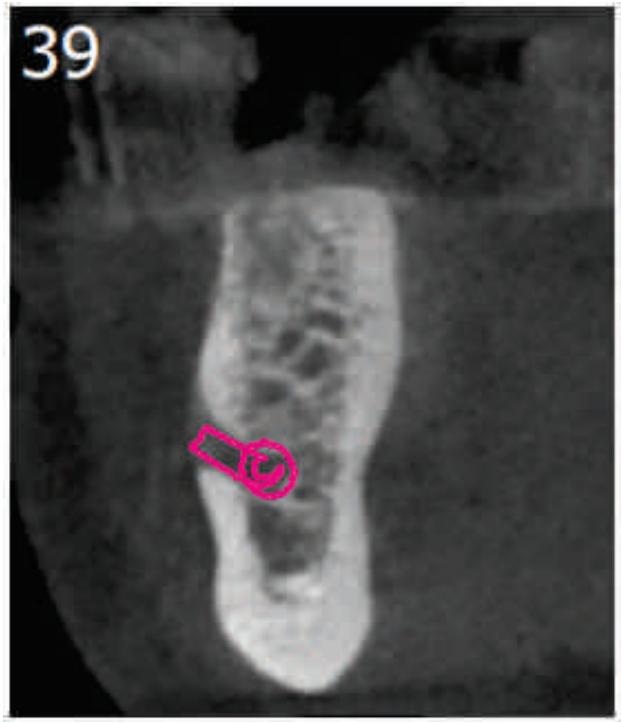
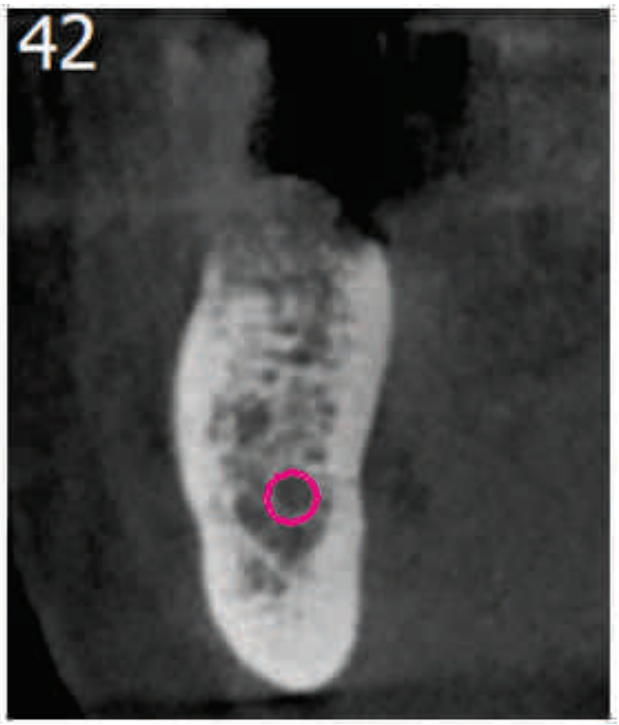
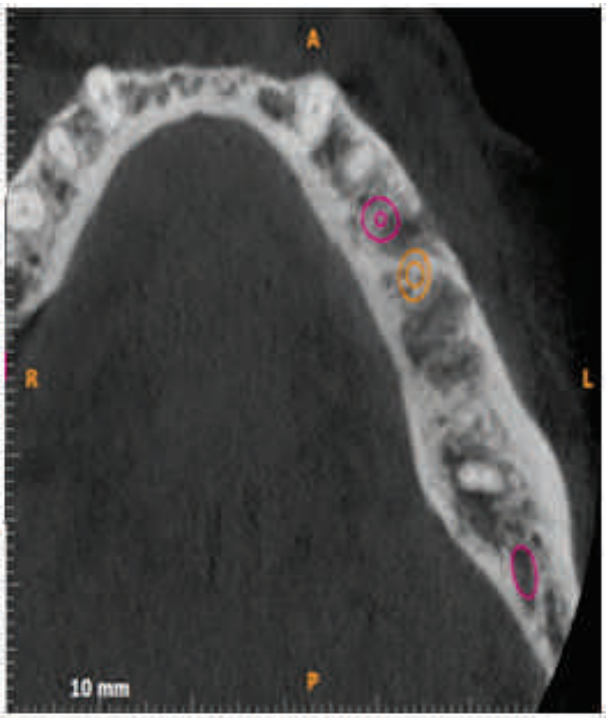
bone height from crest of alveolar bone to mandibular canal is 10.6mm and width 8.3mm. So, we planned 4x8.5mm osstem implant. It revealed thick compact bone and adequate trabecular bone of type 2 quality in the premolar and molar area based on the classification of Lekholm and Zarb.[2] After routine oral prophylaxis, administration of local anaesthesia with a 2% Lidocaine hydrochloride solution containing epinephrine in left inferior alveolar nerve.[3]



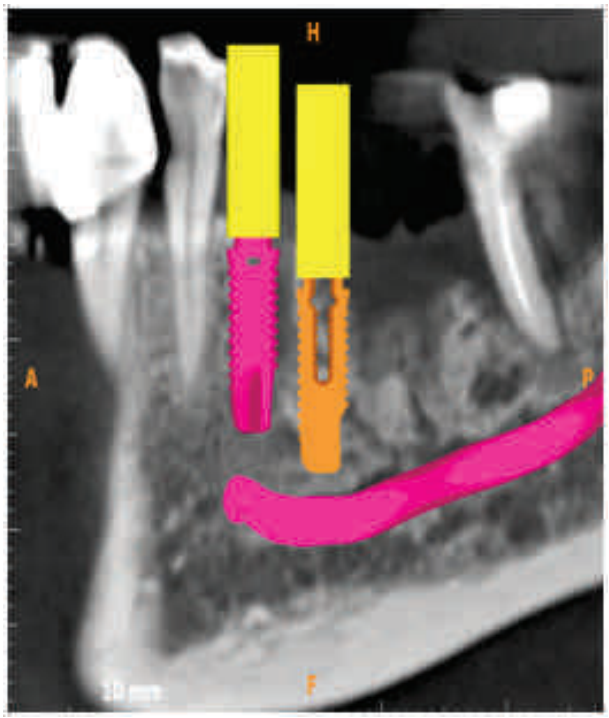
Edentulous area of 35 region



Edentulous area of 36 region



Axial view



Stimulated implant

Full thickness incision was made on crest of edentulous ridge and the flap was raised, bone width was measured.[1] For implant placement sequential ostectomy were drilled with different bur given in implant kit. Parallel sided, threaded, rough surface implant was then placed, and primary stability was achieved. Cover screw was placed on top of the implant (Figure 1) and flap was closed with silk 3.0 suture.[1] Appropriate Antibiotics(Amoxicillin 500mg + clavulanic acid 125mg) TID x 5 days and Analgesics (Diclofenac 50mg + Paracetamol 325 mg + Serratiopeptidase 15 mg) BD x 3 days were prescribed and post-operative instructions weregiven. Patient was recalled after one week for suture removal. During healing period, patient doesnotexpress discomfort or neurological symptoms.

After sixteen weeks of osseointegration period we placed nick & removed the cover screw.Osseo-integration was excellent, and no bone resorption was seen around the implant in radiograph.[3] Then the healing abutment of 4.5x 4mm on each implant was placed. After one week of placement of healing abutment we remove healing abutment &two transfer coping were placed (Figure 2) followed by Additional silicon, open tray impression to capture the position of implant. The impression coping was removed, healing abutment was replaced & shade was also recorded. The case was then sent to the laboratory for temporary crown and custom abutment fabrication.[1]

Final restoration was delivered at 18thweekafter implant placement.[1]The temporary crown was removed and the final crown was then tried in (Figure 3). The proximal contacts and occlusion was checked. The patient was very much satisfied with the final esthetic and functional outcome.[1]Patientis recalled every 6 months in first year and every 12 months in subsequent years.[3]

Implant placement and radiological evaluation of Osseo-integration

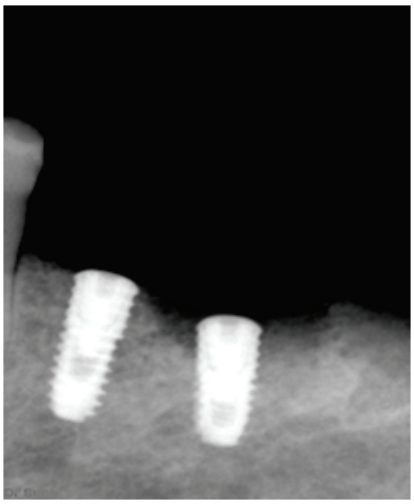


Figure 1 :
Implant with cover screw.

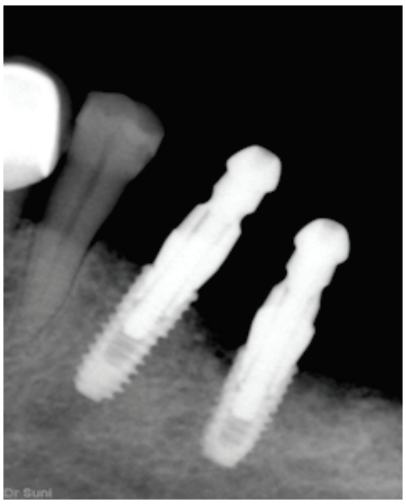


Figure 2:
Implant with transfer coping.

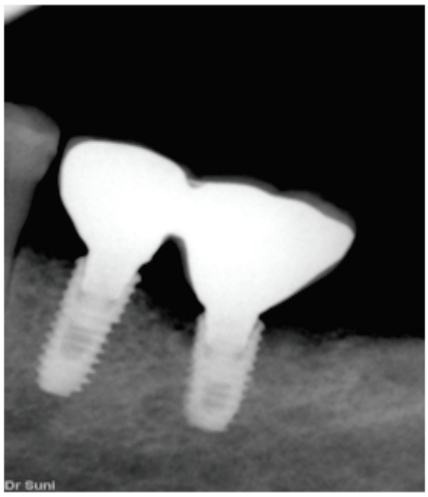


Figure 3 :
Final restoration
(Screw retained bridge)

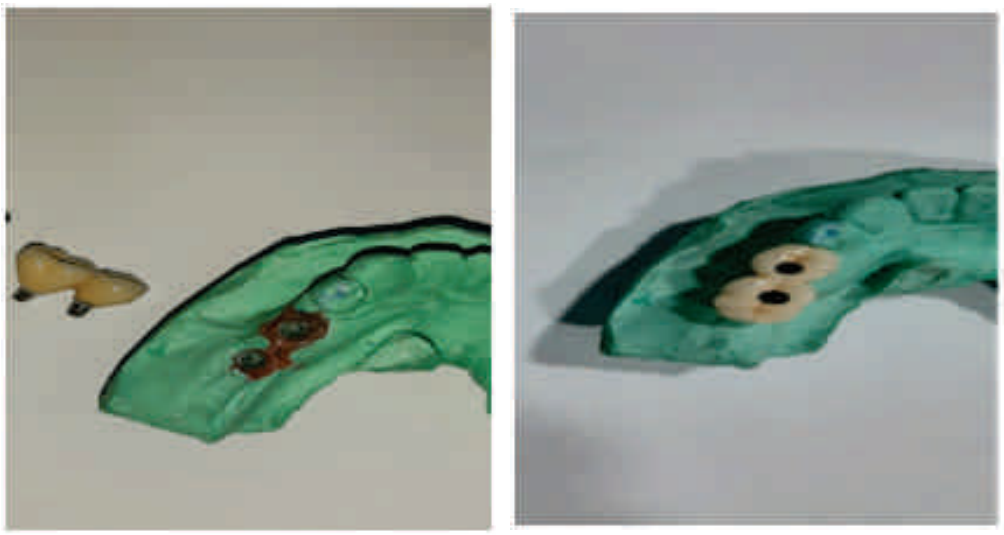


Figure 4 : Laboratory procedure

DISCUSSION

The use of dental implants in the rehabilitation of missing teeth after extraction has become well established and accepted contemporary method. There are many benefits of fixed dental implant- supported prosthetics versus traditional crown and bridge or removal tooth-borne prosthetics. Maintenance of residual bone, ease of oral hygiene increased longevity.[4] This technique has numerous advantages, including preservation of circulation, soft tissue architecture , and hard tissue volume at the site , decreased surgical time ,improved patients comfort. It also allows the patient to resume normal oral hygiene procedures immediately after the surgery.[5] Unless the position of the final prosthesis is visualized prior to the surgery the placement of dental implants may not allow the desired end result to be achieved.[4]

Alternate treatment modalities to our treatment plan included removal partial denture, fixed partial denture and resin bonded bridges. Removal partial dentures while option can contribute to the loss of alveolar bone on both abutment and non-abutment teeth along with that the dissatisfaction rate of removal partial dentures is high. Fixed partial dentures would require unnecessary destruction of adjacent teeth to prepare them as abutment and loss of pristine tooth structure. Another option would be resin bonded bridge, which would reduce the amount of adjacent tooth destruction but with high incidence of pontic failure and debonding.[1]

The approach has some drawbacks including lack of proper drilling depth assessment and inability to correct peri implant defects because they are not exposed during surgery.

CONCLUSION

Placing dental implant in the mandibular posterior region requires precise planning, surgery and prosthetic treatment.[4] The screw-retained prosthesis was originally more popular because its simplified retrieval of supra structure it has become well established and accepted contemporary clinical method.[3]This case report has discussed the importance of the comprehensive and interdisciplinary approach to treatment planning, surgery, and restoration of dental implants in mandibular posterior region of mouth.[4]

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Review Article

Mental Health: Backbone for Healthy India

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REVIEW: National Mental Health Survey of India, 2015-16 conducted at the National Institute of Mental Health and Neuro-Sciences (NIMHANS), Bengaluru under the Ministry of Health and Family Welfare (MoHFW)

GENERAL INFORMATION/ABSTRACT

To criticize is a much more simpler and easy task rather than to applaud for some commendable job done either in the field directly or in the papers with thorough in-depth research, judgmental analysis, sampling and drawing out conclusion to an extent. Research in the field of Medical Sciences has always proven a positive sign in the betterment of mankind along with giving true respect to nature. NIMHANS, Bangalore had done justice in its National Mental Health Survey of India during 2015-16 and our review is largely based on that survey study which emphasizes on the mental conditions and stability of people in India. In its survey NIMHANS reported that about 150 million citizens of Indian need services for mental health care, but less than 30 million actually seek them, reflecting the much underdeveloped facilities of mental health care in India.[1] The excellent work done by NIMHANS in the report "Prevalence, Patterns and Outcomes and Mental Health Systems", it has suggested many ways and solutions to improve the overall mental health status of India.[1] We must appreciate this real hard work and sincere efforts from NIMHANS, Bengaluru.

In recent years, there has been a significant increase in morbidity and mortality due to various mental illnesses, amounting to a huge and undetected social, moral and economical impact.

Our review on this survey revolves around the findings and suggestions made by NIMHANS team. We have tried to assimilate our knowledge and findings while undertaking the review and added comments/recommendations which can largely accelerate the base frame work towards penetrating the population having mental disorders on large scale. The goal is improvisation in medical facilities; as the disabilities and impact on economy are obvious and greatly affect work performance, as well as social and family life, ultimately leading to an imbalanced and improper overall growth of the nation.

INTRODUCTION

Society is rapidly changing and imposing new challenges with every passing moment. Mental Health has become the most important aspect of health today due to increase in stress, poor life style and gadget /internet and drug addictions. With the rapid and expanding use of electronic communication a host of new addictions like internet addiction, shopping addiction or compulsive buying, video game addiction and porn addiction have been detected, leading to rampage of marital conflicts and divorces, financial losses, poor academic performance, sleep deprivation and related physical impairments.[8]

The landmark World Health Report-2001 titled "Mental Health: A New Hope, New Understanding" provided a Public Health Focus. In

spite of WHO's theme of "Stop Exclusion-Dare to Care" the patients with mental illnesses still have a lot of discrimination and social stigma, leading to poor treatment seeking and high morbidity.[1]

OVERVIEW

NIMHANS, Bangalore in its assessment embarks the prevailing situation and conditions in which a person having a diagnosed mental illness has to live with many challenges and brings to notice not just the lack of public health strategies but also several components performing below the expected standard of care. A person suffering from mental illness has to face serious impact of associated stigma, lack of time and patience in family members, poor relations with the treating doctors, financial problems and so on. The current facilities available in mental health system are insufficient, poorly coordinated and fragmented. The illness affects abilities of the patient to work, their quality of family living and social life as well. This further worsens the overall outcome.[1]

Increase in nuclear families, lack of emotional support and ventilation and time constraints (if both parents are working) result in many issues not only confined to mental health but also affecting their physical attributes. Keeping aside the fact that urban population at the end of day has access to health services but rural Mental Health care demands more and great attention, it is an established fact that mental health is the most neglected aspect of general well being particularly in rural areas. There is gross difference in aetiology, causative and protective factors, and awareness about mental illnesses, availability and affordability of treatment, family support and social support to the mentally ill person in urban and rural areas of India. Approximately 70% of population lives in rural areas, with only about one-fourth of the health infrastructure, medical workforce and other health resources.

Second major concern is the growing lack of social connectedness; we are living in virtual world where loneliness has been emerging as a great issue. Being single has become a trademark trend and sort of passion over partners. The self-absorbed individual with a selfie stick in hand would be a great challenge to the social Psychiatrists.[8]

UNIVERSAL SCENARIO

A need to develop proper adequate guidelines for providing quality care in mental health at community base was emphasized. With the same purpose , the European Community Mental Health Service (EUCOMS) provider network was established in 2016.[5] Two additional principles were later added in the above draft according to the Mental Health Action Plan (2013-2020) by WHO and the reports of Joint Action on Mental Health and Wellbeing. [2]

Community Mental Health Care comprises of principles and practices required for promotion of mental health for local population as per Drake et al (2011).

Lots of efforts are being taken all over the world to reduce the stigma about mental illness. The most common and well known strategies include:

- One of Us in DENMARK.[3] and
- Time to Change campaign in ENGLAND

Royal College of Psychiatrists has insisted on equality between physical and mental health care. The concept of inequity and under-funding for mental health remains central to this call.[9]

FINANCIAL ASPECTS AND INSURANCE COMPANIES

Inclusion of mental illness in the list of treatment by Insurance companies has been ordered by law, but hardly any company adhere to that or included it in their plans till date.[8] Due to this the expenses are borne by patient himself or relatives and it's largely unfortunate that due to burden of financial unavailability most of the patients have compromised cognitive skills and can't perform in skilled jobs resulting in lesser earnings and non-treatment. Males are affected mainly during their most earning phases of life (the fourth decade). Even the long term treatment and its expenses are also not borne by relatives resulting in high percentage of incomplete treatment.[1] Median of pocket expenditure per month are approx. INR 1000-1500. Hence the insurance coverage or financial backup from states will improve compliance and the regularity of the treatment.

DOCTOR-PATIENT RELATIONSHIP

Skewed doctor-patient ratio, lack of infrastructure, inadequate supporting staff and long working hours of doctors results in increase stress and work pressure, thereby impairing and even hampering doctor-patient relationship and corporatization of health care sector has also reduced it and converted it into just a commercial exchange.[8]

Stringent laws and implementation in punishing relatives who physically assault doctors and other caring staff or damage hospital property, will be very much helpful.

In addition to medical knowledge, good communication skills, time and stress management in doctors will definitely help in healthy and trustworthy doctor-patient relationship, healing touch and comfort. Psychiatrists can play a pivotal role in this helping in to minimize the violence to some extent as well as helping doctors in reducing their mental pressure resulting in greater productivity by working in comfortable and healthy atmosphere.

CHANGING SCENARIO OF HEALTH PROBLEMS

More weightage to Psychiatry in medical curriculum is needed as Psychosomatic diseases and Psychological reactions and problems in managing chronic diseases like Diabetes, Hypertension, Cardiac problems, Stroke. etc are on the rise. Various surveys have demonstrated higher incidence of development of various physical disorders in a person with mental illness resulting in huge social and economical impact.[7] A report on the global burden of disease states 13% of total disability for mental health disorders – adjusted with lost life of years. More than 300 million people are estimated to suffer from Depression, amounting to 4.4% of global population. Despite the magnitude of burden caused by mental health issues, they continue to be misunderstood in the developing world including India. Good quality medical education with proper weightage to mental health will lead to

development of positive and healthy attitude towards mental illnesses in health professionals. Well planned, meticulous educational activities even at root levels will change the overall outcome and the scenario of mental illnesses.[1]

CARING FOR THE CAREGIVERS

Role of family members as care givers is of utmost value for the best possible recovery and integration of the person with mental illness.[2] Importance of their role in financial, emotional and monitoring aspects for the best possible outcome and compliance must be well appreciated.[6]

Caring for the care-givers is the most neglected part of the health system. Specially, it is great burden on the care givers of psychiatric patients, patients who are paralyzed or bed ridden, patients with cardiac problems or diabetes.

Caregivers' emotional ventilation , discussion about their financial problems, adjustments regarding children and other family members, and sparing time for themselves are important concerns which are to be paid attention to.[6] Mental illnesses have major impact not only on the patient but the family members too. The family members have to sacrifice and compromise on many fronts, which is never well appreciated, noticed and respected.[1]

In addition, very few mental health professionals pay attention on training these care givers about the nature of the illness, their outcome, special skills in handling these patients, compliance with the treatment and above all caring for themselves so as to avoid frustration, exhaustion and mental or physical breakdown.[4]

COPING STRATEGIES

A good mental health system should provide high quality treatment by qualified persons even in remote areas, with the protection of the social and the human rights of a person with mental illness. The preventive aspects of mental health and rehabilitation also need attention. However, unfortunately the present scenario of scarce facilities and non availability of experts is disheartening .[1]

To handle all these issues, more consultants in Psychiatry, psychologists and social workers are needed in India. For the time being, in order to handle the issues of non-availability of the qualified professionals, involvement of the health workers on grass-root level, like ASHA / USHA or ANM should be encouraged for basic training in mental health activities.[1] Various skills and knowledge development and enhancement programmes should be implemented.

Increase in number of postgraduate seats in Psychiatry will help to achieve these goals. Educating ground level workers, school teachers will reduce the burden of mental health issues by early detection and social acceptance. Importance of physical exercise, sports, hobbies, good healthy food habits, healthy lifestyle, keeping away from substance abuse and excessive use of gadgets should be emphasized as a preventive aspect. Acceptance of mental illness as an illness and not God's curse or black magic should be emphasized. Patients should be motivated to reach mental health care centers. The supervision by Psychiatrist of all this supportive workers is must to have proper mental health assessment.

PRESENT SCENARIO OF MENTAL HEALTH CARE

Under the supervision of the central government, the state governments should work for an integrated, comprehensive and widely distributed and spread out mental health facilities at a reasonable cost. Inclusion of mental illnesses and their treatment costs in "Ayushman Bharat" is a ray of hope and a sure way towards mentally healthy India. It will provide a good support system for smooth and faster recovery from mental illnesses. Existing mental health care facilities and human resources, along with establishment of state mental health authorities, in addition to appropriate legislative amendments, budget and financial support, and the availability of drugs on a community level are required in planning of Indian Mental Health policies. This will also need support from social welfare activists, engagement of civil societies in mental health programs and continued information, education and communication (IEC) activities for the masses.[1]

Technology-based applications for home-based care with the help of smart-phone use by healthcare personnel, and evidence-based electronic system for clinical decision-making by doctors can be of great help. Creating systematic longitudinal follow-up protocols for affected individuals in order to ensure continued care through electronic databases and registers can also be useful.[1]

There are six principles serving as the foundation for an integrated model of mental health care on a national, regional and local level. These are: 1) protection of human rights; 2) having a public health focus; 3)supporting service users in their journey of recovery; 4)making use of effective interventions based on evidence and client goals; 5) promoting a wide network of support in the community, and 6) making use of peer expertise in service design and delivery.[4]

RECOMMENDATIONS

1. Our society is rapidly changing and imposing new challenges and mental health has become the most important aspect of well being. But it has still lots of social stigma and discrimination.
2. Various activities should be planned to reduce stigma and misconcepts about mental illnesses and screening for mental health problems should be implemented in other health programmes.
3. A meticulous and well organized, comprehensive mental health planning with integration of various sectors is the need of time. Proper legislations, coordinated educational activities, promotion of healthy attitudes, adequate funding and rehabilitation of persons with mental illness are the basic components of health planning. Special systems should be advocated to have periodical monitoring and evaluation of these activities. More focus on rural areas must be given due to lack of even basic facilities in the rural India.
4. Considering the huge burden of mental health issues, more number of qualified doctors and subordinate staff are required to resolve these issues. Post graduate seats in Psychiatry in various medical colleges should be

increased. Physicians and general practitioners should be trained in detecting psychiatric illnesses. Weightage for Psychiatry as a subject at undergraduate level should be emphasized.

5. Training of school teachers, ground level health workers and social workers, ANMS, Aanganwadi workers etc should be done so that screening of general population can be done. This will help in early detection, education of families about mental illness, early starting of treatment with reduction in stigma and will promote involvement of family and society in treatment. Monitoring of their activities by a Psychiatrist is must. Proper use of digital technologies may reduce the heavy requirement of trained manpower.

6. The stigma associated with mental problems, the ubiquitous issue of addiction, poor scenario of mental health in rural parts and the rapid changes in the diagnostic systems are the issues specific to mental health, thereby posing challenges for social psychiatrists to keep pace with the rapidly changing demands, structure, values and pressures of the society.

7. A handsome amount of the total health budget of India should be reserved and spent on mental health as the present budget is very negligible.

8. The central and state Government hence should spare more budgets for mental health and should establish more halfway homes, sheltered workshops and supported accommodation facilities with good hospital and community based rehabilitation services.

9. Motivating the pharmaceutical industries for investment in mental health activities and planning through partnerships and corporate social responsibilities should be a welcome change.

10. Insurance companies should be forced and motivated for inclusion of mental illnesses in their list of diseases. This will reduce the economic burden on patients and their family members and they will continue regular and proper treatment with better outcome.

11. Medical professionals should be taught about good communication skills, time and stress management, and healthy lifestyles. For this training, Psychiatrist can be the best trainers. These will in turn improve doctor-patient relationship and will reduce pressure and will encourage healthy and comfortable atmosphere for doctors, finally reducing incidences of violence and abuse of doctors.

12. Importance of physical exercise, sports, hobbies, healthy food and life style, keeping away from substance abuse and excessive use of gazettes should be emphasized and people need to be motivated for all these activities as a part of preventive aspect of good mental health strategies.

13. Most important and unfortunately most neglected aspect of mental health is the caring for the care givers. Handling patient with mental illness, diabetes, cardiac problems, bedridden patients or a patient with paralysis is a huge burden and it seriously affects care-givers' emotional ventilation, financial aspects, family and interpersonal relationships, personal life and their other family responsibilities making them stressed out and frustrated. Taking care of them will definitely improve mental health of caretakers and in turn outcome of the patients. In addition it will reduce health care burden. The care takers will play major role in the present movement of shifting mental health from institutions to social, community based treatment.

14. So get motivated, tuned up and stand firm to improve outcomes of mental illnesses in India with the motto of WHO – Stop Exclusion - Dare to Care.

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Review Article

Corona Virus: Practice Management in Dental Clinic

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INTRODUCTION

The past couple of decades have observed emergence of new viruses not previously known to humankind. These viruses came into picture suddenly, cause severe illnesses and hence grab media attention worldwide. Examples include the spread of the Severe Acute Respiratory Syndrome (SARS) Coronavirus in 2002 and the Middle East Respiratory Syndrome (MERS) Coronavirus in the year 2012.

In the beginning of December 2019, a novel corona virus emerged in a Chinese seafood and poultry market in Wuhan city, China. Typically, patients who are infected from the virus develop fever, myalgia, cough or exhaustion with unusual changes in chest CT. More uncommon side effects being sputum production, cerebral pain, hemoptysis and looseness of the bowels. These side effects normally show up in 2-14 days post introduction. The irresistible specialist causing this viral pneumonia that was inescapable in Wuhan was at long last recognized as a novel Covid (2019-nCOV) which is the seventh individual from the group of Covids that are known to taint people. On eleventh February 2020, WHO named the novel viral pneumonia as "Covid Disease (COVID19)", while the worldwide board on scientific categorization of infections (ICTV) named it as SARSCoV-2.

The Centers for Disease Control and Prevention (CDC) stated that Coronaviruses are usually found in animals such as bats and camels. The current transmission however was occurring due to droplets produced by those infected when they coughed or sneezed and infected people who came in contact with these droplets.

An interesting finding was the outbreak of Covid 19 matched that of seasonal flu, which also presents similar signs and symptoms and hence could be a confounder in proper diagnosis. Three key points that can help clinicians differentiate whether a patient has COVID-19 and not common flu includes:

A travel history from Wuhan City, China, in previous 14 days before hand the commencement of symptoms.

Interaction with a person suspected for COVID-19 while that person was ill in the last 14 days before the onset of symptoms.

Close contact with a confirmed COVID-19 patient, who shows signs and symptoms in the last 14 days.

Dental experts assume fundamental parts in forestalling the transmission of Covid 19, by suggesting and actualizing compelling disease control measures in their dental practice to hinder the patient-to-tolerant transmission courses in dental centers.

CONCEIVABLE TRANSMISSION ROUTES OF COVID 19 IN DENTAL CLINICS (Figure 1)

Dental centers and medical clinics convey high danger of spreading Covid 19 disease because of the immediate up close and personal correspondence with patients and defilement with their body liquids, mostly salivation, blood. It can likewise spread through inward breath

of airborne microorganisms which endure noticeable all around for significant stretches and through the contact of conjunctival, nasal, or oral mucosa with beads and mist concentrates containing microorganisms. These can be sent by hacking and talking without a veil and furthermore through roundabout contact with debased instruments or potentially natural surfaces.

AIRBORNE SPREAD

Aerosols and droplets are produced during dental procedures mixed with patient's saliva and/or blood and can be transmitted from infected patient's cough and breathing. These particles are very tiny and they remain in air for a prolonged duration before settling on environmental surfaces orentering the respiratory tract.

CONTACT SPREAD

A dental professional frequently comes in contact with human fluids and other patient contaminated objects like dental instruments, dental materials or environmental surfaces, directly or indirectly. Dental specialists and different patients may contact their conjunctival, nasal or oral mucosa with beads and mist concentrates containing microorganisms which are created from a Covid contaminated individual and are pushed to a short separation when the patient hacks or talks without wearing a cover.

PRECAUTIONS TO BE FOLLOWED FOR INFECTION CONTROL IN DENTAL PRACTICE

Since aerosols and droplets are the primary routes of spread of Covid 19, stringent infection control measures should be adopted in the dental office.

PATIENT EVALUATION

Infected patient with COVID-19 (acute febrile phase): Such patients should not visit the dental clinic.

If it does occur: Identification of the patient with suspected Covid 19 infection is important. The patient ought to be promptly answered to the disease control office, without performing dental treatment.

Next, is recording certain important parameters. These include:

A. Thermal screening by forehead thermometer is strongly suggested.

B. Recording the patient's oxygen saturation using devices like a pulse oximeter.

C. Screening each patient for their general and medical history beforethey enter the dental clinic.

THESE QUESTIONS SHOULD INCLUDE THE FOLLOWING

(1) Have you encountered fever over the most recent 14 days?

(2) Do you have any respiratory issues, for example, a hack or have you confronted breathing trouble in the previous 14 days?

(3) Have you gone in the previous 14 days to any Covid 19 hotspot and its encompassing territories?

(4) Have you interacted with a patient with an affirmed finding of Covid 19 contamination in the previous 14 days?

(5) Have you interacted with any individual who originates from any Covid 19 hotspot and its close by zones, or with individuals around you with late reported fever or respiratory issues inside the previous 14 days?

(6) Are there in any event two individuals in close contact with you, who have encountered fever or potentially respiratory issues in recent days?

(7) Have you as of late been to any open social occasions, gatherings or had a nearby contact with a horde of unacquainted individuals?

On the off chance that patient's answer to any of the above screening questions is "yes", and the patient's internal heat level is underneath 37.3°C, at that point the dental treatment can be delayed until 14 days post the presentation occasion. The patient ought to be encouraged to self-isolate at home and report any fever experience or influenza like manifestations to the nearby doctor.

On the off chance that a patient's answer to any of the screening questions is "yes", and the patient's internal heat level is no under 37.3 °C, at that point the patient ought to be encouraged to promptly self-isolate. These patients ought to be accounted for to the disease control branch of the clinic or to a doctor.

In the event that a patient's answer to all the screening questions is "no", and his/her internal heat level is underneath 37.3 °C, at that point the dental treatment can be kept after general safety measures of disease control. Splash or vaporized producing methods should best be maintained a strategic distance from.

On the off chance that a patient's answer to all the screening questions is "no", however his/her internal heat level is no under 37.3 °C, at that point the patient ought to be alluded to the disease control center or to facilities specific for COVID-19 consideration for additional clinical feeling and care.

HAND HYGIENE

Hand-washing should be emphasised upon for preventing the spread of Covid 19. Dental professionals should wash hands repeatedly at various times like, before examining any patient, before starting dental treatment, after touching any patient, after touching the surroundings like the dental chair and/orhardware without sterilization, in the wake of contacting the patient's oral mucosa, harmed skin or twisted, or in the wake of interacting with the patient's blood, body liquids, emissions or excreta. Airborne bead course of spread is the fundamental methods for spread, especially in dental facilities and medical clinics. All the dental experts should wear customized insurance gear, which incorporate defensive eyewear, gloves, tops, veils, face shields and defensive outwear. In case protective outwear is unavailable, then the working clothes should be covered with extra disposable protective clothing.

RUBBER DAM ISOLATION

Rubber dams can suggestively be used with high-speed hand pieces and dental ultrasonic devices since they help to minimize the production of aerosol or spatter contaminated

with saliva and/or blood.

ANTI-RETRACTION HAND PIECE

Anti-retraction dental hand pieces which are specifically designed with anti-retractive valves are strongly recommended. Hand pieces without anti-retraction valves aspirate and expel the fluids produced during dental procedures. These fluids may contain microbes, including bacteria and viruses, leading to further contamination of air and water tubes inside the dental unit. These in turn increase the chances of cross-infection.

DISINFECTION

The dental clinic settings should be cleaned and disinfected in accordance with the Protocol for the Management of Surface Cleaning and Disinfection of Medical Environment (WS/T 512-2016) released by the National Health Commission of the People's Republic of China.

MANAGEMENT OF MEDICAL WASTE

According to the Protocol for the Disinfection and Sterilization of Dental Instrument (WS 506-2016) released by the National Health Commission of the People's Republic of China the reusable instrument and items should be pretreated, cleaned, sterilized, and properly stored.

PREVENTIVE PROTOCOL OF COVID 19 INFECTIONS

The incubation period of COVID 19 viral infection is around 14 days so the patient or bystander may be asymptomatic while he comes to your clinic, all dental clinics are advised to follow the necessary precautions.

Front office should necessarily

- Verify with each patient if they have any symptoms like fever, cough, running nose, sneezing.
- Verify with patient if any of them or their family members have had any foreign tours and if so have they reported to the health officials.
- It is mandatory to have contact details of the patient & proper documentation of each patient.

AVOID OR POSTPONE TREATMENT OF PEOPLE HAVING FEVER, COUGH, SNEEZING ETC. UNDERTAKEN ONLY EMERGENCY ELECTIVE TREATMENT

- If your identify or suspect any patient with any symptoms like fever, headache, drowsiness etc. for the past few days refer them for a proper medical check-up and care

Universal infection control procedures should be adhered to; all clinic staff necessarily wears personal protective equipment like masks & gloves.

- Use three layered masks and practice adequate hand hygiene procedures.
- Use hand wash after each case and followed by use of hand sanitizers by the doctor and assistant.
- Follow universal precautions for infection control (eg:- double surgical gloves, eye wear, triple layer masks, apron for doctors and assistant).
- Proper infection control measures to be followed.

Precautionary measure for all cases in places where COVID19 has been confirmed

- Reschedule appointment for elective scaling, crown preparation, restoration to reduce splatter contamination of clinic for a suitable period of time
- Infective cases like surgical dental extraction, incision and drainages of abscess etc to be done with extra precaution
- Use of disposable drapes for patients and barrier films recommended

USE HAND SANTIISERS AND SURFACE DISINFECTANTS:

Hand Sanitisers: preferably chlorhexidine with alcohol based or alcohol based(hand rub solution)

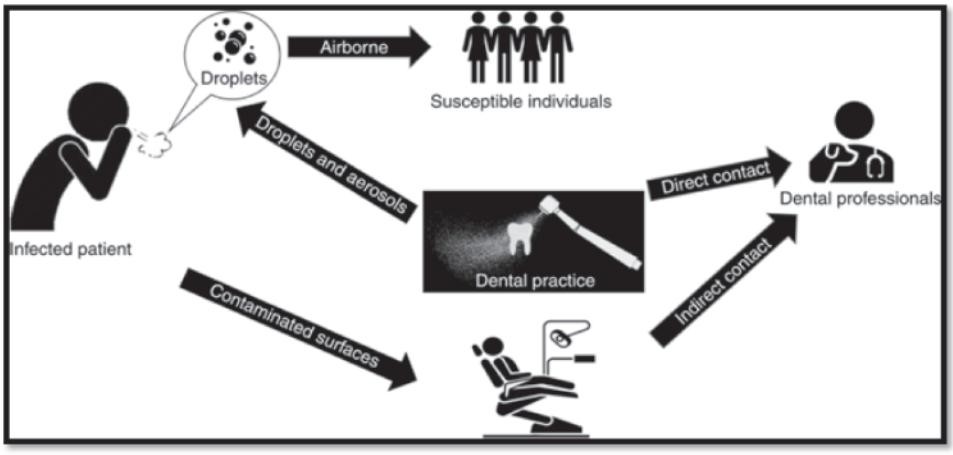
Environmental surface disinfection should be performed, preferably using accelerated hydrogen peroxide(0.5%)/ benzalkonium chloride (0.05%)/ ethyl alcohol (70%) /isopropanol (50%), sodium hypochlorite (0.05-0.5%). These are very effective against corona viruses.

- Important points to note while using disinfectants is to check the labels and use according to the manufacturer's instructions, and be aware of their potential health hazards. Eye and skin contact should be avoided. The products should be kept away from the reach of children. Different cleaning products should not be mixed and should always be used in a well ventilated area.

SUMMARY

Since December 2019, the newfound Covid 19 has lead to a worldwide pandemic. Coronavirus enters the host through human cell receptor ACE2, same like SARS-CoV, yet has a higher restricting fondness.

The current article sums up the potential courses of Covid 19 transmission, for example, the airborne or contact spread and spread through defiled surfaces. We prescribe a few clinical techniques to hinder the viral transmission and to give a reference to forestalling the transmission of Covid 19 in the dental office, which incorporates assessment of the patient, after legitimate hand cleanliness, utilizing individual defensive measures for the dental specialists, utilization of mouth washes before dental systems, utilization of elastic dam and against withdrawal hand pieces, sterilization of the dental office and clinical waste administration.



DIFFERENT TRANSMISSION ROUTES OF 2019-nCOV IN DENTAL CLINICS & HOSPITALS

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Editor's Pick

New Drug Approvals

The following drugs have recently been approved by the FDA. Includes newly approved drugs and new indications for drugs already approved.

- **Nexletol (Bempedoic acid) Tablets**

Company: Esperion Therapeutics, Inc.
Date of Approval: February 21, 2020
Treatment for: Hypercholesterolemia

Nexletol (Bempedoic acid) is a first-in-class, Adenosine triphosphate-Citrate Lyase (ACL) inhibitor for the treatment of adults with heterozygous familial hypercholesterolemia or established atherosclerotic cardiovascular disease who require additional lowering of LDL-Cholesterol.

FDA Approves Nexletol (Bempedoic acid) to Lower LDL-Cholesterol - February 21, 2020

- **Vyepti (Eptinezumab-jjmr) Injection**

Company: Lundbeck Inc.
Date of Approval: February 21, 2020
Treatment for: Migraine Prophylaxis

Vyepti (Eptinezumab-jjmr) is a calcitonin gene-related peptide antagonist indicated for the preventive treatment of migraine in adults.

FDA Approves Vyepti (Eptinezumab-jjmr) Intravenous Injection for the Preventive Treatment of Migraine - February 22, 2020

- **Anjeso (Meloxicam) Injection**

Company: Baudax Bio, Inc.
Date of Approval: February 20, 2020

Anjeso (Meloxicam) is an NSAID injection indicated for use in adults for the management of moderate-to-severe pain, alone or in combination with non-NSAID analgesics.

FDA Approves Anjeso (Meloxicam injection) for the Management of Moderate to Severe Pain - February 20, 2020

Twirla

- **(Ethinyl estradiol and Levonorgestrel) Transdermal System**

Company: Agile Therapeutics, Inc.
Date of Approval: February 14, 2020
Treatment for: Contraception

Twirla (Ethinyl estradiol and Levonorgestrel transdermal system) is a low-dose combined hormonal contraceptive patch for birth control.

FDA Approves Twirla (Levonorgestrel and Ethinyl estradiol) Contraceptive Patch - February 14, 2020

- **Pemfexy (Pemetrexed) Injection**

Company: Eagle Pharmaceuticals, Inc.
Date of Approval: February 8, 2020
Treatment for: Non-Small Cell Lung Cancer, Malignant Pleural Mesothelioma

Pemfexy (Pemetrexed for injection) is a branded alternative to Alimta for the treatment of nonsquamous non-small cell lung cancer and malignant pleural mesothelioma.

FDA Approves Pemfexy (Pemetrexed for injection) as a Branded Alternative to Alimta - February 10, 2020

Audenz

- **(Influenza A (H5N1) Monovalent Vaccine, Adjuvanted) Injection**

Company: Seqirus
Date of Approval: January 31, 2020
Treatment for: Influenza Prophylaxis

Audenz (Influenza A (H5N1) Monovalent Vaccine, Adjuvanted) is a cell-based influenza vaccine designed to protect against influenza A (H5N1) in the event of a pandemic.

FDA Approves Audenz (Influenza A (H5N1) Monovalent Vaccine, Adjuvanted) as First-Ever Adjuvanted, Cell-Based Pandemic Influenza A (H5N1) Vaccine - February 3, 2020

Palforzia

- **(Peanut (Arachis hypogaea) Allergen Powder-dnfp) - formerly AR101**

Company: Aimmune Therapeutics, Inc.
Date of Approval: January 31, 2020
Treatment for: Peanut Allergy

Palforzia (Peanut (Arachis hypogaea) Allergen Powder-dnfp) is an oral immunotherapy indicated to help reduce the severity of allergic reactions, including anaphylaxis, that may occur with accidental exposure to peanut.

FDA Approves Palforzia [Peanut (Arachis hypogaea) Allergen Powder-dnfp] as First Treatment for Peanut Allergy - January 31, 2020

Trijardy XR

- **(Empagliflozin, Linagliptin and Metformin hydrochloride) Extended-Release Tablets**

Company: Boehringer Ingelheim and Eli Lilly and Company
Date of Approval: January 27, 2020
Treatment for: Diabetes Type 2

Trijardy XR (Empagliflozin/Linagliptin/Metformin hydrochloride) is a fixed-dose combination of the sodium-glucose cotransporter 2 (SGLT2) inhibitor empagliflozin (Jardiance), the dipeptidyl peptidase-4 (DPP-4) inhibitor linagliptin (Tradjenta) and the biguanide metformin hydrochloride indicated as an adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus.

FDA Approves Trijardy XR (Empagliflozin/Linagliptin/Metformin) for Type 2 Diabetes in Adults - January 27, 2020

Tazverik

- **(Tazemetostat) Tablets**

Company: Epizyme, Inc.
Date of Approval: January 23, 2020
Treatment for: Epithelioid Sarcoma

Tazverik (Tazemetostat) is a methyltransferase inhibitor for the treatment of patients with epithelioid sarcoma.

FDA Approves Tazverik (Tazemetostat) for the Treatment of Patients with Epithelioid Sarcoma - January 23, 2020 Tepezza

- **(Teprotumumab-trbw) Injection**

Company: Horizon Therapeutics plc
Date of Approval: January 21, 2020
Treatment for: Thyroid Eye Disease

Tepezza (Teprotumumab-trbw) is a fully human monoclonal antibody (mAb) and a targeted inhibitor of the insulin-like growth factor 1 receptor (IGF-1R) for the treatment of active thyroid eye disease (TED).

FDA Approves Tepezza (Teprotumumab-trbw) for the Treatment of Thyroid Eye Disease (TED) - January 21, 2020

Monoferric

- **(Ferric derisomaltose) Injection**

Company: Pharmacosmos Therapeutics Inc.
Date of Approval: January 16, 2020
Treatment for: Iron Deficiency Anemia

Monoferric (Ferric derisomaltose) is an intravenous iron replacement product indicated for the treatment of iron deficiency anemia.

FDA Approves Monoferric (Ferric derisomaltose) Injection for the Treatment of Iron Deficiency Anemia - January 29, 2020

Numbrino

- **(Cocaine hydrochloride) Nasal Solution**

Company: Lannett Company, Inc.
Date of Approval: January 10, 2020
Treatment for: Nasal Anesthesia

Numbrino (Cocaine hydrochloride) nasal solution is a local anesthetic indicated for the introduction of local anesthesia of the mucous membranes for diagnostic procedures and surgeries on or through the nasal cavities of adults.

FDA Approves Numbrino (cocaine hydrochloride) Nasal Solution for Nasal Anesthesia - January 13, 2020

Valtoco

- **(Diazepam) Nasal Spray**

Company: Neurelis, Inc.
Date of Approval: January 10, 2020
Treatment for: Epilepsy

Valtoco (Diazepam) is a benzodiazepine nasal spray for the short-term treatment of epilepsy cluster seizures.

FDA Approves Valtoco (Diazepam Nasal Spray) as a Seizure Rescue Treatment - January 13, 2020

Ayvakit

- **(Avapritinib) Tablets**

Company: Blueprint Medicines Corporation
Date of Approval: January 9, 2020
Treatment for: Gastrointestinal Stromal Tumor

Ayvakit (Avapritinib) is a kinase inhibitor for the treatment of PDGFRα exon 18 mutant gastrointestinal stromal tumors (GIST).

FDA Approves Ayvakit (Avapritinib) for the Treatment of Adults with Unresectable or Metastatic PDGFRA Exon 18 Mutant Gastrointestinal Stromal Tumor - January 9, 2020

Ubrelvy

- **(Ubrogepant) Tablets**

Company: Allergan plc
Date of Approval: December 23, 2019
Treatment for: Migraine

Ubrelvy (Ubrogepant) is a potent, orally-administered CGRP receptor antagonist for the acute treatment of migraine with or without aura in adults.

FDA Approves Ubrelvy (Ubrogepant) for the Acute Treatment of Migraine - December 23, 2019

Enhertu

- **(Fam-trastuzumab deruxtecan-nxki) Injection**

Company: AstraZeneca and Daiichi Sankyo Company, Limited
Date of Approval: December 20, 2019
Treatment for: Breast Cancer

Enhertu (Fam-trastuzumab deruxtecan-nxki) is a HER2-directed antibody and topoisomerase inhibitor conjugate indicated for the treatment of adult patients with unresectable or metastatic HER2-positive breast cancer who have received two or more prior anti-HER2-based regimens in the metastatic setting.

FDA Approves Enhertu (Fam-trastuzumab deruxtecan-nxki) for HER2-Positive Unresectable or Metastatic Breast Cancer Following Two or More Prior Anti-HER2 Based Regimens - December 20, 2019

Caplyta

- **(Lumateperone) Capsules**

Company: Intra-Cellular Therapies, Inc.
Date of Approval: December 20, 2019
Treatment for: Schizophrenia

Caplyta (Lumateperone) is an atypical antipsychotic for the treatment of schizophrenia.

FDA Approves Caplyta (Lumateperone) for the Treatment of Schizophrenia in Adults - December 23, 2019

Dayvigo

- **(Lemborexant) Tablets**

Company: Eisai Inc.
Date of Approval: December 20, 2019
Treatment for: Insomnia

Dayvigo (Lemborexant) is Dual Orexin Receptor Antagonist (DORA) for the treatment of insomnia.

FDA Approves Dayvigo (Lemborexant) for the Treatment of Insomnia in Adult Patients - December 23, 2019

Conjupri

- **(Levamlodipine maleate) Tablets**

Company: CSPC Pharmaceutical Group Limited
Date of Approval: December 19, 2019
Treatment for: Hypertension

Conjupri (Levamlodipine maleate) is a calcium channel blocker indicated for the treatment of hypertension.

FDA Approves Conjupri (Levamlodipine maleate) for the Treatment of Hypertension - December 20, 2019

Ervebo

- **(Ebola Zaire Vaccine, live) Injection - formerly V920**

Company: Merck
Date of Approval: December 19, 2019
Treatment for: Prevention of Ebola Zaire Disease

Ervebo (Ebola Zaire Vaccine, live) is a vaccine indicated for the prevention of disease caused by Zaire Ebolavirus in individuals 18 years of age and older.

FDA Approves Ervebo (Ebola Zaire Vaccine, Live) for the Prevention of Disease Caused by Zaire Ebolavirus - December 19, 2019

(Ravindra Bangar)

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