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# Eating Disorders and Its Dental Impact

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**Abstract:- This article is a review of eating disorders and its impact in oral tissues and their management. As in most cases dentist are the first to diagnose eating disorders as it may cause many changes in oral cavity and its function. Most commonly affected people are teen girls and adult females. It is classified as Anorexia nervosa, Bulimia nervosa, Binge eating disorder and pica. Most of these eating disorders are associated with psychological problem such as depression, anxiety and obsessive compulsive disorder. Dentist can contact psychiatrist to help the patient medically and dental management are given by dentist. Most of the patients are challenged nutritionally. Thus dentist also play an important role in identifying and helping patients with eating disorder.**

***Keywords***:- *Behavior, Eating Disorder, Nutrition, Oral cavity.*

## I. INTRODUCTION

Eating disorders (ED) have psycho pathological causes and patient show abnormal diet patterns; manifesting through deformed or chaotic eating behavior. It leads to unhealthy lifestyle by destroying individual physical and emotional well-being[1]. Health issues like diabetes, loss of menses, heart problem, self-esteem problems, metabolic and endocrine disturbances. In addition to systemic problems, there may be some dental problems like increased dental trauma, caries, xerostomia, dental erosion, salivary gland swelling, and periodontal diseases[2]. It has increased incidence in both male and female over past years and its mortality and morbidity rates are highest among any mental disorders. The dentist role in screening and diagnosis of such systemic diseases by their oral presentation is well established. The earliest manifestation appears in oral cavity with an oral aesthetics deterioration, discomfort, pain and impairment of oral functions with these dentists can encounter this disorder. Thus, dentists take care of their patient on regular basis sometimes throughout their childhood and adolescences[3].

Disorders are present in many different forms and yet physical manifestations are tip of iceberg when compared to side effects. Even with treatment some may relapse and recovery is difficult. Dental surgeons have an important role in finding such a patient by taking detailed history and noticing oral changes, so that, he can communicate possible findings to the psychiatrist and manage it properly with both psychiatric and dental care as needed[4].

## II. ETIOLOGY

The main cause for disorder is due unaccepted self perception and not satisfied with one's own body appearance. The eating disorder is also stimulated by following factors like biological, psychological and cultural factor [1]. Media portraying about unrealistic beauty and thinness about models affects the female mindset. It usually occurs in females who have undergone physical or psychological trauma and other illness like depression, anxiety, self injuring personality, obsessive compulsive disorder, and chemical dependency [5]. Some may have inherited it genetically; studies shows first degree relatives of patients with eating disorder have 10 folds higher risk [6].

Biological factors include gene expression altered by environmental factors without altering underlying DNA sequences. Eating behaviour is controlled by the hypothalamus –pituitary-adrenal axis. Disturbances in hormone production, transmission or its transmitters lead to eating disorders. Other conditions like brain calcifications, elevated auto-antibodies, metabolic disorders and lesions of frontal and temporal lobe [1]. Serotonin not only regulates appetite, but also in mood regulation and hence several studies confirm that alteration in serotonin activity leads to eating disorders [8].

Psychological factors like body image disturbance, personality traits, childhood sexual abuse. Body image disturbances such as body cachexia that depends on self esteem dissatisfaction. Personality traits like attention seeking, stress reactivity harm avoidance, perfectionism [8]. Due to poor self esteem and poor self regulation these patients overcome this by altering their diet [1]. The Diagnostic and Statistical manual classified Eating disorder as Anorexia nervosa(AN), Bulimia Nervosa(BN) and Eating disorders not otherwise specified(EDNOS). The International Classification of Diseases (ICD) classifies into AN, BN, atypical AN, BN, Vomiting interlinked with other psychological conditions and psychogenic loss of appetite [9]. Here in this article let us discuss about Anorexia Nervosa, Bulimia Nervosa, Binge Eating disorder, Picca, Night Eating disorder.

❖ *ANOREXIA NERVOSA*

Anorexia nervosa is a Greek word, which means "loss of appetite"[13].It is cautious self-starvation and resulting weight-loss linked with pathological fear of gaining weight[10]. According to DSM -5, there are 3 diagnostic criteria;

1)Inadequate calorie intake relative to need leading to a low body weight in context of age , sex, development trajectory and physical health. Refusal to maintain body weight irrespective to their age and height[10].
2) Fear of gaining weight despite of underweight[10].
3)A damaged view of their own body weight, size and shape. And also lack self evaluation and recognition of being low body weight and its serious issues[10].

Patient usually have amenorrhea[5]. They also use over exercise to burn calories and mirror gazing always. Purging practices includes inducing vomiting, use of laxatives, diuretics and slimming, medicines.[12].Anorexia patient usually give history of low libido[13].

The risk factors are;

➢ *Physiological /physical*
- Changein cerebral functioning and serotonin.

➢ *Psychological /psychiatric*
- Depression or anxiety or any disorders in family or individual.
- Obsessive compulsive disorder
- Perfectionism

➢ *Environmental*
- Diet history .
- Premorbid obesity .
- Stressful life .
- Any type of abuse.
- Strong attitude to be thin always.[11]

It can be a coping mechanism against family conflicts, abuse or academic pressure.[12]. Symptoms like lanugos hair covering the face and trunk, less BMI, bradycardia, hypotension, bluish-discoloration of feet and hand, hypothermia, loss of heart and brain tissue, osteoporosis[10]. It may be sometimes mistaken as depression disorder, schizophrenia, bulimia nervosa[13].

❖ *BULLIMIA NERVOSA*

According to DSM-IV, it is defined as a episodes of binge eating that occur twice weekly for 3 months or longer[6]. The patient usually has habit of self inducing vomiting with fingers or pencil or comb to trigger the gag reflex, this leads to callus on dorsal side of the finger. They should have proper dental checkup since the acid content of vomit often erodes tooth enamel[13].Similar to anorexia these patients also misuse laxatives and other medications. They indulge themselves in alcohol, drugs and tobacco and sexual activities. There are two subtypes as purging type and non-purging type[13].

According to DSM 5 diagnostic criteria includes
1) Consuming unusual amount of food in separate time interval.
2) Lack of control to overeating during an episode.
3) Compensatory behaviors like over exercising and burning calorie for that uncontrolled overeating mainly during episodes over 3 months or longer
4) Always concern about body shape and weight.
5) Disturbances does not occur exclusively during episodes of anorexia.[10]

The weight of these patients usually fluctuates, but it is always within limits. About one third of patients have a history of anorexia or obesity. The bulimic patient usually consumes 1500-6000 calorie with hour of binge, usually high calorie sweetened foods. Egg ice cream, sweets etc.. This is followed by an episode of depression, guilt and purging behavior. According to research by the National Institute of Dental and craniofacial in US, 28% of patients are identified during the first dental appointments [5]. The risk factors include

➢ *Physiological/physical*
- Serotonin disorders.

➢ *Psychological/psychiatric*
- Personality disorder.
- History of anxiety or depression or any other disorders in family or individual.
- Having low self esteem.

➢ *Environmental*
- History of dieting.
- Premorbidity overweight (18-40%). (7-20%)
- Desire to be thin.
- Any abuses.[11]

Medical complication like a sore throat, esophageal tear, dehydration, electrolyte imbalance, irregular heartbeat, cardiac arrest, damage to liver, bowl, and kidney, acne, alopecia, hypertrichosis[5].They are mistaken as anorexia nervosa, neurologic disease, borderline personality disorder,seasonal affective disorder and major depressive disorder[13].

❖ *BINGE EATING DISORDER*

Large amount of food is consumed during short period of time. There is no regular meal plan and timing and patient eat alone because of embarrassment of eating more. Mostly these symptoms are also seen in bulimia nervosa[14].The main complaint of patient with binge eating is weight gain. Most commonly seen in a patient who is obese[15].

According to DSM 5, the diagnostic criteria are
1) Patient eats large amount of food in a short period of time in repeated episodes.
2) There is no control about quantity of eating.
3) a. Eating very fast
b. Eating until they are uncomfortably full
c. Eating large quantities even not hungry.
d. Eating alone because of embarrassment.
e. Feeling depressed and guilt because of overeating
4. Occurs at least once a week for three months.
5. No compensatory.[10]

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It results because of difficulty in reward processing and inhibitory control[15].Binge eating occurs due to the negative effect in life which relieved by eating. Some neuroimaging studies have indicated over activity of the orbitofrontal cortex and low activity of prefrontal network in patient with binge eating disorder. It is also associated with substance abuse, low moods and they may have moderate to severe depression with BN[11]. These patients have increased risk of diabetes, heart diseases, certain cancers and increased risk of arthritis[5].

❖ *PICA*

The name PICA is from Latin magpie which means bird known for big and random appetite. It is a habit of eating non food substances like eating chalk, paper, stones or bricks. Calcium, zinc or iron deficiency can be reason for pica. Unusual consumption like clay may bind to iron and can cause deficiencies [17]. Most commonly seen in children and low intellectual person and also seen in women during pregnancy[16].

It is usually isolated disorder, but usually accompanied by OCD, schizophrenia and trichotillomania[16]. Geophagia, pagophagia, amylophagia are some complications. Lead poisoning complications seen in women during pregnancy and high levels lead to seizure. Fetal toxicity has been reported [16].

❖ *MEDICAL COMPLICATIONS*

Eating disorders always have a great impact over systemic health due to malnutrition.[1]

❖ *ANOREXIA NERVOSA*

It is a psychiatric disorder causing sudden death due to obstructive coronary artery disease, left ventricular atrophy. Bradycardia due to sudden weight loss and at times with spontaneous pneumothorax. The most common effect on bone is that the osteoporosis .Most people commonly suffer from hypoglycemia leading to osmotic dieresis. Sometimes utmost complications is infertility. In some conditions dermatological changes like alopecia and increase in facial hair with lots of wrinkles.[12]

➢ *Effect on Female*

Females most commonly suffer from amenorrhea and 95% of females suffer from psychiatric illness. Somewoman suffer from euthyroid syndrome[6[.

❖ *BULIMIA NERVOSA*

The condition usually occur due to self induced vomiting undergone by some people for weight loss. The level of complication mainly occurs on the basis of mode and frequency of vomiting due to electrolyte acid base balance. People undergoing weight loss by self induced emesis often starve.[1]

Complications include alopecia, xerosis, pruritis and some people have sub conjunctival hemorrhage due to lack of proper nutrition to the body. some people insert their hand into their mouth to induce vomiting and cause skin aberrations on hand. Most common complication of self induced vomiting is that the ulcers, hemetemesis, Boerhaave's syndrome. Dehydration is the other most commonest complications of repeated vomiting leading to tachycardia, hypotension. It also leads to increased risk of miscarriages. Emetic toxicity leads to sudden death at times. Pneumodiastinum is another most causing complications due to aspiration of food that is regurgitated.[2]

❖ *LAXATIVE ABUSE*

Usage of laxatives causes effects like hypovolemia, functional impairment, melanosis coli. Cathartic colon syndrome is another serious colon syndrome resulting incapable of releasing feces.[2]

❖ *ORAL COMPLICATIONS*

Loss of enamel and dentin(Perimolysis) is the most commonest complication leading to sensitivity. Secondly comes the xerostomia due to enlargement of salivary gland(sialadenosis).Impairment of taste(Dysgeusia) due to xerostomia leading to redness of mucosa causing burning sensation and bleeding gums leading to gingivitis, Periodontitis thereby increasing the risk of dental caries and also causing opportunistic infections like candidiasis ultimately leading to squamous cell carcinoma.[1]

❖ *EFFECT ON SOFT TISSUES*

Eating disorder has its impact on periodontal tissues, oral mucosa, salivary gland and oral functions.(9)

➢ *Periodontal tissues*

Periodontal disease is of two types – gingivitis and periodontitis. Gingivitis is more common in anorexia patients because of poor oral hygiene.(6) Periodontitis in an eating disorder patient is not an inflammatory condition, it is because of deficient anti-bacterial host-defence mechanism.(9) The cause of periodontitis in eating disorder patient is vitamin C deficiency and xerostomia.(6)

➢ *Oral mucosa*

Lesions in oral mucosa are common in eating disorder patients. (9) The aetiological factors are iron deficiency, vitamin B12 deficiency and self-inflicted injuries.(9) Angular cheilitis, glossitis and mucosal ulceration are seen as a result of nutritional deficiency.(4) Traumatic injuries are seen in soft palate of bulimic patients when they try to induce vomiting using pen, finger, comb.(6)

➢ *Salivary gland*

Sialadenosis is one of the rare feature of eating disorder patients.(9) Parotid gland is commonly affected.(9) Bulimia nervosa patients has more chances of developing sialadenosis.(9) Sialadenosis occurs more commonly patients who purge by vomiting.(9) Recurrent vomiting because of cholinergic or autonomic stimulation is the cause of sialadenosis.(6) Salivary flow rate is decreased in patients with eating disorder.(9) It results in increased incidence of caries, more prone to infection and altered taste sensation.(9) Stimulated salivary flow is reduced in eating disorder patients and unstimulated salivary flow is reduced in eating disorder patients along with sialadenosis.(9) The

pH of saliva is decreased in anorexia nervosa and bulimic patients which predispose to dental caries.(9)

➢ *Oral function*

Eating disorder affects the normal chewing, swallowing and speech.(9) The pharyngeal and velar gag reflex is absent in bulimic patient.(9) Bulimic patients also experience abnormal swallowing pattern and altered taste sensation.(9)

❖ *MANAGEMENT*

In anorexia, the patient recovery usually takes average of six years from diagnosis. Patient is hospitalized and removed from all visitors, television and independent use of washroom. It can be allowed as positive reinforcement after weight gain. Psychotherapy and antidepressants is sometimes given for both bulimia and anorexic patient (12).Medicine used for binge eating disorders can include selective serotonin reuptake inhibitor (SSRI) like sertraline fluoxetine, antiepileptic drugs like citalopram(15). In pica, the patient is given proper education and inter professional team approach by doctors is needed(16).

## III. CONCLUSION

If a patient is suspected to have eating disorder, the dentist should ask questions regarding their food habits and check for any oral findings. Regular follow up should be done. Patient should be advised to brush with fluoridated tooth paste, and reduce acidic drinks and sweet consumption. Dental hypersensitivity and erosion is prevented by topical fluoride application Patient is advised to rinse with water, milk or bicarbonate solution after vomiting to neutralize the acidic environment. Patient should be advised not to brush after vomiting which may erode the tooth surface. Salivary substitutes should be given to counter xerostomia. Composite resin restoration is done in eroded tooth surface to prevent sensitivity. Porcelain, metal onlays, veneers are other options for composite restoration. Secondary prevention of eroded tooth surface is done by giving mouth guards to the patients.

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