ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Oral Implications of Eating Disorders in Children and Adolescents – A Review.

Deepak Viswanath*, and Madhumitha Naithani.

Department of Pedodontics and Preventive Dentistry, Krishnadevaraya College of Dental Sciences, International Airport Road, Hunasamaranahalli, SMVIT post, Bangalore 562 157, Karnataka, India.

ABSTRACT

Eating disorders(ED) are one of the most frequent psychiatric problems faced by adolescents, and are characterised by a continual course, complex psychopathology, medical complications, and elevated mortality. They are a group of psychopathological disorders affecting patient's relationship with food and body shape, manifesting as distorted eating behaviour and are of serious concern in one's health. It includes anorexia nervosa (AN), bulimia nervosa (BN) and eating disorders not otherwise specified (EDNOS).Hence the objective of this paper is to review various eating disorders in children and adolescents including their characteristic features, types, diagnosis, medical and oral complications as well as their proper management.

Keywords: Eating disorders, Anorexia nervosa, Bulimia nervosa, Eating Disorders not Otherwise Specified, Pica

Corresponding author

ISSN: 0975-8585

INTRODUCTION

Eating problems and disorders range from unhealthy eating pattern and concern with body size/shape to life-threatening disorders such as anorexia nervosa and bulimia nervosa. This particular disorder is defined as a persistent disturbance of eating behaviour or behaviour intended to control weight, which in turn significantly impairs physical health or psychosocial functioning [1-3]. On the other hand eating behaviour maybe defined as "sequential or behavioural answers associated with the act of eating, manner or mode of eating, rhythmic patterns of feed" [4,5].

Abnormal eating patterns seen in appearance conscious adolescent population may have a etiologic root during childhood [6]. Seen especially during 15-16 years of age these complex illnesses may have a varied medical and dental implications in later life [7]. Such behaviour is influenced by social, demographic and cultural conditions, by the individual perception, the food, previous experiences and the nutritional status. The influence of the media, magnified by globalization and society, was described by Anschutz *et al* [8] and Oliveira and Hutz [9], who emphasize the contradiction between the appeal for healthy lifestyle at the same time that it is praised the cult of thinness and it is encouraged the consumption of high-calorie foods. This confusing scenario may finally pave the way for the evolution of eating disorders in later life. In pursuit of the ideal aesthetic appearance, weight loss is induced by inadequate methods, like fasting and intense physical exercise, and gain muscle mass is stimulated by excessive workouts, improper diet and the use of anabolic steroids [10].

Eating disorders are related to clinical complications that vary according to the characteristics of the disorder, occurring stunted growth [11], cheilosis, dental erosion, periodontitis, salivary gland hypertrophy, hypovolemia, electrolyte imbalance and weight gain. When the beginning of ED occurs during adolescence, such disorders affect social and family relationships, and suicidal ideation becomes more common [9,12].

Hence this paper aims at reviewing the various aspects including the types, diagnosis as well as psychological, medical and dental management of patients suffering from these varied conditions.

Etiopathogenesis

The aetiology of eating disorders is widely accepted to be a combination of genetic, psychological and sociocultural factors.[1] The key point in pathogenesis of eating disorders is the distorted self perception of and resultant dissatisfaction with the physical appearance of one's body [13]. A variety of social, developmental, genetic and familial risk factors have been implicated in the aetiology of these disorders. (Table 1) [13].

Table 1: Risk factors associated with development of eating disorders. Individuals with a positive history of mentioned factors are at an elevated risk of developing chaotic eating patterns and subsequent eating disorder [13].

Biological:	Genetic predisposition, epigenetic mechanism, impaired fat metabolism, irregularities of hypothalamus-pituitary-adrenal axis, elevated levels of auto antibodies, Brain calcifications, lesions of temporal or frontal lobe of brain.
Psychological:	Psychoneurosis, morbid fear of obesity, depression, schizophrenia, poor self-esteem, anxiety, loneliness, obsessive compulsive disorders, border-line personality disorders, attention deficit hyperactivity disorders, narcissistic, histrionic or avoidant personalities, perfectionist personality body dysmorphic disorders .
Sociocultural factors:	Physical, sexual, verbal abuse, childhood negligence bulling and social isolation, peer pressure, mass media influence.
Demographic:	Females, higher or middle economic class.
Personal habits :	Drug abuse, alcoholism, consumption of non-nutrition items
Family :	High familial expectations/dysfunctions, family history of psychoneurosis, positive family history.
Occupation:	Models, actors, dancers, atheletes

Types of Eating Disorders and Their Diagnostic Criteria

The first attempt to classify eating disorders was made by Anna Freud [14,15] who considered organic ED, difficulties due to differences between parental feeding program and child's needs, and neurotic eating

disorders(determined by hostile feelings in the relationship with the caregiver, transferred on the food that he symbolizes.

The Diagnostic and Statistical manual of Mental Disorders (DSM-IV) [16] or the International Statistical Classification of Diseases and Related Health Problems (ICD-10)[17] classified ED into:

- Anorexia Nervosa(AN): a restrictive form in which food intake is severely limited [18,19].
- Bulimia Nervosa(BN): binge-eating episodes are followed by attempts to minimize the effects of overeating via vomiting, catharsis, exercise or fasting [18,19].
- Eating Disorders not Otherwise Specified(EDNOS): eating disorders where all the criteria for AN and BN are not met [18,19].

Each successive version of Diagnostic and Statistical manual of Mental Disorders(DSM) and the International Statistical Classification of Diseases and Related Health Problems(ICD) has been adapted in the face of increasing knowledge about eating disorders in childhood [20]. Currently work is in progress in developing DSM-V.

Another type of eating disorder seen in children is "Pica" which is the craving or eating of items that are not food e.g.: clay, sand, paint chips, brick pieces, etc. This can lead to complications like malnutrition, intestinal obstruction, intestinal infections, anaemia, mercury and lead poisoning (from paints), liver and kidney damage, constipation and abdominal problems. Oral manifestations include abfraction, attrition and erosion due to a habitual and culturally adapted practice [21].

Anorexia Nervosa

People with AN manifests severe weight loss, with psychological conditions that contribute to mortality[22] with suicides in large number from AN.[23] Depression is common along with anxiety symptoms like delirium, cardiac arrhythmias, coma and death. The behaviours of concern include skipping meals, reducing meal portion size or leaving food behind when served a normal portion, vomiting, and exercising compulsively to lose weight [1].

Diagnostic criteria for anorexia nervosa [1]

- Refusal to maintain body weight at or above a minimally normal weight for age and height
- Fear of gaining weight or becoming fat, even though underweight.
- Disturbance in the way in which one's body weight or shape is experienced, denial of seriousness of current low body weight.
- Amenorrhea in post-menarche females.

Laboratory findings [1]

Metabolic acidosis is common with those who purge on vomiting. Rapid shift in fluids and electrolytes, including hypomagnesaemia and hypokalaemia.

Medical Complications [1,24]

Anorexic patients tend to suffer from complications such as bradycardia, hypothermia and hypotension. Other problems include menstrual irregularities coupled with ovarian changes, amenorrhea, stunting of growth and alopecia.

Oral manifestations

Characterized by self-starvation and excessive weight loss, anorexic patients are not able to maintain a good oral hygiene due to exhaustion and lack of motivation. This increases their risk of periodontal diseases and caries which may later lead to soft tissue lesions, angular cheilitis, candidiasis, and glossitis. Table 2 enlists the various oral manifestations seen with respect to ED along with their causes [13].

Management [1]

Treatment for EDs is mainly based on expert clinical opinion following various diagnostic guidelines available. To establish and maintain a therapeutic alliance is highly important in the management of eating disorders. Many patients with anorexia nervosa are initially reluctant to enter treatment and may remain preoccupied with their symptoms. Many are secretive and may withhold information about their behaviour because of shame. Management of eating disorders should be a multidisciplinary approach involving psychiatrists, psychologists, endocrinologists, dentists, gastroenterologists [1].

Anorexia remains the psychiatric disorder with the highest mortality, and can create enormous anxiety and conflict in personal and professional relationships.[25] AN patients who are emaciated require urgent medical attention with close monitoring for dehydration, electrolyte disturbances, renal problems, cardiac compromise with a variety of arrhythmias.

Nutritional Rehabilitation

The goals of nutritional rehabilitation for seriously underweight patients are to restore weight, normalize eating patterns, achieve normal perceptions of hunger and satiety, and correct biological and psychological squeal of malnutrition. Forced nasogastric or parenteral feeding can be done in case wherever necessary

Medication

Antidepressants: Selective Serotonin Reuptake Inhibitors like Fluxetine is used.

Antipsychotics: Second-generation antipsychotic medications such as olanzapine, quetiapine may improve weight gain and psychological indicators and are used for AN

Antiepileptic drugs: A recent review suggested that Carbamazepine and Valproate may be effective in treating patients of anorexia nervosa when they are used to treat an associated psychiatric (e.g. mood) or neurological (e.g. seizure) disorder; otherwise, both agents, particularly valproate, are associated with weight gain.

Psychosocial interventions Although psychosocial interventions, including psycho education, individual therapy, family therapy and (in some settings) group therapy, are considered to be the mainstay of effective treatment for anorexia nervosa.

BULIMIA NERVOSA

Characterised by expression of anxiety, depression, loneliness, perceived loss of control over food intake, self- induced vomiting [24]. Most patients will be of normal weight. Russell's sign, calluses or abrasions on the dorsum of the hand overlying the metacarpophalangeal and interphalangeal joints, caused by repeated contact with the incisors during self-inducing vomiting. Dental caries and enamel erosion from repeated vomiting occurs.

Diagnosis criteria [1]

• Recurrent episodes of binge eating characterized by both of the following

Eating in a discrete period of time (within any 2 hour period) more food than most people would eat during a similar period of time and under similar circumstances.

- A sense of lack of control over the eating during the episode

Recurrent inappropriate compensatory behaviour in order to prevent weight gain such as self- induced vomiting; misuse of laxatives, diuretics, enemas or other medication; fasting; or excessive exercise.

Binge eating and inappropriate compensatory behaviours both occur on average, at least twice a week for 3 months

• Self-evaluation is unduly influenced by body shape and weight.

Laboratory findings [1]

Hypokalaemia, metabolic alkalosis, hypochloremia

Medical Complications [1,24]

In case of bulimic patients; aspiration, oesophageal or gastric rupture, hypokalaemia with cardiac arrhythmias, pancreatitis, drug induced myopathy or cardiomyopathy are the associated complications.

Oral Manifestations [13]

Table 2: common oral manifestations of eating disorders[13].

Oral Tissue	Manifestation	Causes
Dentition	Enamel erosion, perimolysis (dental erosion on the palatal surfaces of teeth), sensitivity	Vomiting, salivary gland manifestations of ED affecting salivary flow rate, buffering capacity and pH of saliva resulting in erosion. Lemon pica.
	Caries	Poor oral hygiene, excessive consumption of carbonated drinks, sweets, caffeinated drinks or sports drinks for stamina
Oral mucosa	Mucosal atrophy, glossitis, oral ulcerations, erythematous lesions of the soft palate	Nutritional deficiency including iron and vitamin deficiency
	Erythematous lesions of soft palate and pharynx.	Trauma caused by inserting foreign objects into the oral cavity to induce vomiting.
	Candidiasis	Opportunistic infection by *Candida albicans* due to nutritional deficiencies, salivary dysfunction, secondary infection of mucosal lesions induced by trauma.
	Angular cheilitis	Nutritional deficiency, candidal infection or concomitant candidal and staphylococcal flora.
Periodontal and gingival tissues	Gingivitis, periodontitis, scurvy, advanced periodontitis in young individuals	Poor oral hygiene, vitamin C deficiency.
Salivary glands	Sialadenosis, non inflammatory enlargement of salivary gland	Peripheral autonomic neuropathy.
	Hyposalivation, xerostomia, altered salivary flow rate, buffering capacity, pH and composition of saliva. Necrotising sialometaplasia	Side effects of drugs such as anti-depressants, vomiting, nutritional deficiency.
Alveolar bone	Osteopenia , osteoporosis	Nutritional deficiency, infection of dental or periodontal origin causing quicker alveolar bone loss.
Tongue	Glossodynia, taste impairment, dysgeusia, hyposgeusia, burning sensation	Trace metal deficiencies particularly zinc, somatoform disturbances and mucosal atrophy.

Purging via vomiting may lead to parotid gland enlargement and salivary dysfunction which which increases the risk for caries and/or burning tongue and mouth due to xerostomia. Incresed acidity in the oral cavity due to acidic vomitus results in classic lingual surface tooth enamel erosion followed by dentinal sensitivity. Detailed oral manifestations of BN are given in Table 2 [13].

Management [1]

Oral health care providers are often the first to identify BN based on oral manifestations. Upon recognition of oral clues, the first task of the oral health care provider is to help the patient seek therapy.

Antidepressants

As individuals with bulimia nervosa exhibit an elevated lifetime prevalence of mood disorders, antidepressants appear to be effective for such patients. Fluoxetine, an antidepressant of the selective serotonin reuptake inhibitor is the only agent approved by the Food and Drug Administration for the treatment of BN.

Dental treatment

Restoration of dental impairment can be done to regain normal appearance but only after treatment of the eating disorder. Composite restorations can be done for aesthetic rehabilitation and to counteract sensitivity. Specialised instructions for dental care and maintenance of oral health for the ED patients are listed in table 3 [13].

Table 3: Specialised instructions for dental care and maintenance of oral health for the ED patients are listed below[13].

I. For oral prophylaxis	• Proper oral hygiene maintenance using soft bristled brush, nonabrasive fluoridated toothpaste and rinse for remineralisation; regular oral check-ups. • Patients must be made aware that the oral hygiene products they use are not acidulated. • Use of desensitizing toothpaste to decrease dentinal sensitivity.
II. For maintaining oral pH:	• Not to brush before an erosive challenge as dental pellicle can provides some protection against an erosive acidic challenge. • Not to brush teeth after vomiting; which may cause excessive enamel erosion. • Patients with purging type of behaviour should be advised to rinse their mouth with water or milk, antacid preparation, or to chew gum immediately after vomiting to decrease acidity in mouth. • Medication given for systemic conditions would not result in side effects of dry mouth or nausea, stoppage and substitution of offending medication • Neutral artificial saliva or sialagogues pastilles to be advised in case of dry mouth.
III. Modified diet patterns	• Avoid acidic, citrus, carbonated or alcoholic drinks. • Wholesome nutritious diet along with healthy drinks such as milk to increase calcium uptake. • Referral to the dietician and regular intake of multivitamins and calcium supplements.

CONCLUSION

Eating disorders in children and adolescents can be of long duration, potentially life-threatening depending on severity of illness, and with likely relapse if adequate alternative coping skills are not developed. The principle of care is a comprehensive, multidisciplinary approach, with close collaboration with parents [25]. Hence a planned and skilful approach to treatment is necessary to obtain a cost-effective, healthy outcome.

REFERENCES

[1] Vinitha Elizabeth, M Subha. Asian Journal of Pharmaceutical and Clinical Research 2013;6(4):71-3.
[2] Kauatav Chakraborty, Debashish Basu. Indian J Psychiatr 2010;52(2):174-186.

[3] Fairburn CG, Walsh BT. Atypical eating disorders (Eating disorder not otherwise specified). Eating disorders and obesity: A comprehensive handbook. In: Fairburn, Brownwell, editors. London: Guilford;2002.pp. 171-7
[4] Juliana de Abreu Gonçalves, Emilia Addison M. Moreira, Erasmo Benício S. de M. Trindade, Giovanna Medeiros R. Fiates. Rev Paul Pediatr 2013;31(1):96-103.
[5] BVS [homepage on the Internet]. São Paulo: Descritores em ciências da saúde [cited 2011 Sep 18]. Available from: http://decs.bvs.br/
[6] Gertrud Sofie Hafstad, Tilmann von Soest, Leila Torgersen. J Eating Disord 2013;1:35
[7] Steinhausen H-C, Gavez S, Winkler MC. The Int J Eat Dis 2005;37(2):119–26.
[8] Anschutz D, Engels R, Leeuwe JV, Strien J. Psychol Health 2009; 24:1035-50.
[9] Oliveira LL, Hutz CS. Psicol Estud 2010; 15:575-82.
[10] Herpertz-Dahlmann B. Child Adolesc Psychiatr Clin N Am 2009; 18:31-47.
[11] Eckhardt SM, Ahmed SF. J Pediatr Gastroenterol Nutr 2010;51 (Suppl 3):S127-8.
[12] Swanson SA, Crow SJ, Le Grange DL, Swendsen J, Merikangas KR. Arch Gen Psych 2011; 68:714-23.
[13] Stuti Bhargava, Mukta Bhagwandas Motwani, Vinod Patni. Arch Orofacial Sci 2013; 8(1):1-8.
[14] Leonardo Sacrato, Alessandro Pellicciari and Emilio Franzoni. Italian J Pediatr 2010; 36:49.
[15] Freud A. Lo studio psicoanalitico dei disturbi infantile dell'alimentazione. *Opere, Torino: Boringhieri* 1979, 2:. (1946).
[16] American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM IV). Washington, DC: American Psychiatric Association 1994.
[17] World Health Organization (WHO). The ICD-10 Classification of Mental and Behaviour Disorder. Clinical Description and Diagnostic Guidelines. Geneva, Washington DC: WHO; 1992.
[18] Amit Upadhyah, Rajesh Misra, Deepak Parchwani, Pankaj Maheria. National Journal of Physiology, Pharmacy and Pharmacology 2014;4(2):143-47.
[19] Neville H Golden. J Adolescent Health 2003; 33:496-503.
[20] Dasha Nicholls, Rachel Chater, Bryan Lask. Int J Eat Disord 2000;28(3):317-324.
[21] Shweta Advani, Gulsheen Kochhar, Sanjay Chachra, Preeti Dhavan. J Int Soc Prevent Comm Dentistr (to be published).
[22] Godart N, Berthoz S, Rein Z, et al. Int J Eat Disord 2006;39(8):772-778.
[23] Mehanna HM, Moledina J, Travis J. 2008; 336(7659):1495-1498.
[24] Neeta Misra, AnshulMehra, PradyumMisra, Jaya Mehra. JIAOMR, 2010; 22940:S19.
[25] Dasha Nicholls. Adv Psychiatr Treat 1999; 5:241-9.