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Case Report

PICA: A Menace for Oral Health

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Abstract

The pica is a symptom, not a disease, which is manifested by persistent and compulsive eating of non-nutritious substances like soil, clay, chalk, stone, brick, paper, soap and fecal matter or edible ice (pagophagia), starch (amilofagia). The most common forms of pica are geophagia or mud/soil eating and then pagophagia or consumption of ice. Similar to other symptoms in medicine, such as fever and anemia, pica is a multi-symptom, being iron deficiency and zinc deficiency. The pica despite being a symptom, according to the type of pica and intensity of which can cause morbidity and mortality. In some types of pica, may cause obstruction and damage the digestive tract. Its etiology is unknown but in case of children most likely due to ignorance on the part of the health, or with some mental illness, or lack of time with parents. Prolong and undiagnosed pica may have adverse effect on oral health as well. The cause of tooth wear should be considered when patients present with an unusual pattern of tooth surface loss. The purpose of this review and case report is to draw attention to this clinical sign, so that this potential problem can be identified at an early stage. This article presents a case of a patient who had tooth surface loss and damaged restorations as a result of pica.
Keywords: eating disorders, iron deficiency, pica, zinc deficiency.

INTRODUCTION

According to the *Statistical Manual of Mental Disorders*, pica is defined as "a compulsive desire to eat non-food for longer than one month without food". Pica is an eating disorder with persistent ingestion of non-nutritive substances an age for which this behaviour is developmentally abnormal. It may be benign or may have life-threatening consequences [1]. It is not a disease or a disorder but a behaviour that results from the interaction of biologic, environmental and psychological factors. The term pica has come from a Latin word 'magpie' *(Pica pica)* a bird known for its indiscriminate and unusual eating habits. Although pica is seen in all age groups but it is more prevalent in children and females. In children age group of infants is vulnerable. It is considered to be non-pathological up to the age of 2 years because they are in habit of exploring things while teething. Pica is also commonly observed in children with the developmental disabilities (mental retardation, autism)[2]. Often pregnant females have pica, particularly those living in poverty, in tropical and tribal areas. In India pica is more prevalent in rural population than in urban [3]. Though the exact etiology of pica is not known but there is certain proposed hypothesis. Socio-economic and cultural factors, nutritional deficiency have been implicated to cause pica. It has been proposed that pica may be either a cause or an effect of iron deficiency anaemia. Studies have shown that pica craving in individuals with iron deficiency stops when iron supplements are given to them [4]. Deficiency of iron, calcium, zinc and many B-complex vitamins is usually found in persons with pica. In children many causes may lead to pica, it may be due to parental neglect, ignorance on the part of health, or with some mental illness, or lack of parent-child interaction, etc. Prolong and undiagnosed pica can lead to various dental problems. The amount of tooth surface loss depends on the duration and the type of material eaten leading to abrasion, erosion, staining of teeth, periodontal problems, poor hygiene and halitosis.

Signs and symptoms

Usually, pica remain unnoticed unless it results in complications that lead to some medical attention.The clinical picture of pica is very diverse and is sometimes associated with specific medical conditions. Like in case of poisoning or exposure to infectious agents, the symptoms are extremely variable and are related to the type of toxin or infectious agent ingested.

Other findings may include the following

- Manifestations of toxic ingestion (eg, lead poisoning)
- Manifestations of infection or parasitic infestation (eg, toxocariasis and ascariasis)

- GI manifestations (eg, bowel problems, constipation, ulcerations, perforations, and intestinal obstructions)
- Dental manifestations (eg, severe tooth abrasion, abfraction, and tooth surface loss)

The tooth surface loss as a result of pica has been well documented previously. Wear due to chewing or swallowing sand has also been reported [5]. It was discussed in a publication that a pregnant female routinely consumed clay during her seven pregnancies and had widespread abrasive toothwear[6]. Other adverse effects on the oral tissues due to the ingestion of different non-food substances have also been reported. The oral manifestations of lead poisoning and iron deficiency anaemia can be widely found in many of the textbooks [7]. The most common oral manifestations of the condition are generalized attrition and a sign of iron deficiency anaemia, due to atrophic tongue.

Diagnosis

No specific laboratory studies are indicated in the evaluation of pica. However, certain laboratory studies may be indicated to assess the consequences of the condition.

Imaging studies used to identify ingested materials and aid in the management of gastrointestinal (GI) tract complications of pica may include the following:

- Abdominal radiography
- Upper and lower GI barium examinations
- Upper GI endoscopy

Management

No medical treatment is specific for pica. A multidisciplinary approach involving psychologists, physicians and a dental surgeon is recommended for effective treatment. Currently, behavioural management strategies are considered the most effective in the treatment of pica. Such strategies include the following:

- Training to differentiate between edible and nonedible items
- Devices that prohibit placement of objects in the mouth
- Sensory reinforcement
- Differential reinforcement of other or incompatible behaviours

Additional management measures include the following:

- Correction of any nutritional deficiencies that are identified
- Consultation with a psychologist or psychiatrist
- Consultation with a social worker
- Consultation with a dentist

If the cause is any nutritional deficiency or some iron or zinc deficiency proper supplements should be given [8]. Most often ferrous sulfate is recommended to treat iron deficiency, but frequent problems associated with this drug including gastrointestinal discomfort, bloating and other distress, make it unacceptable to many patients. Another substitute is ferrous gluconate, which is roughly equivalent in cost, produces fewer problems and is preferable for the treatment of iron deficiency. Ascorbic acid supplementation enhances iron absorption [9].

CASE REPORT

A 32-year-old female was referred with a chief complain of bleeding gums and tooth wear. On clinical examination, there was generalised gingival inflammation, abnormal tooth wear on multiple teeth (Figure 1 and 2) and slightly atrophic and depapillated tongue. The oral hygiene level was fair. On detailed questioning with patient she admitted to have a habit of grinding earthen pots pieces between her teeth, which she had not discussed with any other health professional previously. This habit started when she was pregnant and it persisted for about 10 years. She also detailed that there was also a significant amount of stress in her personal life around this time. The patient was employed in a company and mentioned difficulty in managing at work place and home. There was no relevant medical history and she was a non-smoker. The patient was well educated with no history of mental illness or any kind of parafunctional habit. The treatment plan was discussed with the patient. The treatment plan consisted of patient education and motivation, oral hygiene reinforcement, scaling and root planing and restoration of tooth wear. Blood investigations were done for any possible deficiencies. The investigations included full blood count, urea and electrolytes, serum ferritin, vitamin B12 and zinc. The results of all these tests were normal except for vitamin B12 and serum ferritin that were slightly low. The patient was diagnosed with iron deficiency anaemia and her medications for the same were started. After complete oral prophylaxis and restorations (Figure-3) the patient was referred to the concerned medical practitioner for further opinion and management. The patient was reviewed monthly and on subsequent follow-up examinations revealed good oral health and reduction in consumption of brick pieces by the end of 1st month and the habit finally stopped after 3 months.

Fig-1: Pre-operative with unusual tooth wears (Labial Surface)

Fig-2: Pre-operative with unusual tooth wears (Occlusal Surface)

Fig-3: Post-operative with restoration

DISCUSSION

Pica is likely to cause effects on oral health and particularly on teeth. Chewing on stones, grits or chalk can lead to attrition of teeth. On reviewing literature, many studies have reported ill effects of pica on dentition. Say *et al*. in 1969 published problems resulted with clay consumption was due to iron deficiency which occurred in children along the border between Iran and Turkey [8]. These youngsters had other, peculiar abnormalities including massive hepato-splenomegaly, poor wound healing and a bleeding diathesis. These children initially had simple iron deficiency associated with pica, including geophagia. Such children display signs of iron deficiency, including pallor and thinned nails that were concave and had raised edges, known as spooning of the nails. They had depapillated tongue and superficial erosions or fissuring at the angles of the mouth, which frequently signals riboflavin deficiency. This may be due to the reason that the soil contained compounds that bound both iron and zinc. The secondary zinc deficiency caused hepatomegaly and other unusual abnormalities [10]. In another case report, where the tooth showed attrition due to a sand eating habit was reported by Djemal *et al*. which was somehow similar to our case [11]. Another case reported by Johnson *et al*. showed abfraction, attrition and erosion due to a habitual and culturally adapted malpractice [12]. An unusual case report, where depression associated with pregnancy lead to patient adopt eating disorder. Her dental condition diagnosed her with pica and bulimia [13]. This condition was also similar to our case. As hypothesized by various studies the theories behind it can be a nutritional theory and a physiological theory. The nutritional theory suggests that appetite-regulating brain enzymes, altered by an iron or zinc deficiency, trigger specific cravings, may be of some non-food items which do not supply the minerals deficient in the person's body. The physiological theory to explain pica is that eating clay or grit helps relieve nausea, control diarrhea, increase salivation, remove toxins and alter odor or taste perception during pregnancy [14]. In the present case patient was well educated and was compliant enough to understand the importance of psychological counselling and she was advised to be calm, practice meditation and yoga. In the management

of pica of psychotic etiology, medications such as selective serotonin reuptake inhibitors (SSRIs) have been used successfully. But this was not required in our case. When patients consume unusual items, such as mud, clay, etc. it can bind iron in the gastrointestinal tract, exacerbating the deficiency. However, it is not very clear that whether pica causes this or it is the consequence of iron deficiency anaemia. It has also been documented that some mental health conditions such as obsessive-compulsive disorder (OCD) and schizophrenia can sometimes cause pica [15]. In children also pica is very common. It is suggested that in children, stress associated with traumatic events is linked to pica disorder such as maternal deprivation, parental separation or neglect, child abuse, disorganized family structure and poor parent-child interaction [16]. Pica may also be secondary to hookworm infection with symptoms like bluish hue of the skin, particularly around the mouth which was absent in our case. Thus, for its management an initial approach often involves screening of any mineral deficiencies and if necessary treating them as early as possible.

Conclusion

The effect of eating non-food substances like stones, clay, brick, chalk, etc. may have deleterious effects on the dentition. The importance of carefully exploring all the possible etiologies of tooth surface loss should be emphasized when recording a case history especially when a patient presents with an unusual pattern of wear. Hence, it can be concluded that a thorough medical and personal history of a patient, helps in a better diagnosis and an appropriate treatment plan.

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