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Oral Manifestations of Gastrointestinal Diseases in Pediatric Population

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Introduction

The oral cavity is a reflection of the gastrointestinal (G.1) system and oral changes are an expression of gastrointestinal diseases. Alterations within the oral cavity can be the first sign of systemic diseases and may allow early diagnosis and treatment. G.I. disturbances cause a decrease of essential vitamins which can severely affect the growth and development of growing tissues. There is a change in the quality of dental tissues along with delayed eruption of teeth and jaws. Studies prove that the oral cavity changes like dental erosion is seen in about 22°/c of children aged 4 years and 44°/c aged 12 years. In Europe and North America, 9 out 15 children have gingivitis and adolescents show prevalence of about 60°/c (Italian ministry of health, Guidelines 2013). In USA, enamel hypoplasia is seen in 10 to 49°/c of primary dentition (Stayton). 33°/c children show at least one tooth with enamel hypoplasia or opacities. A comprehensive review of G.I. diseases with their manifestation is illustrated below.

Crohns Disease

It is an inflammatory bowel disease which affects any part from mouth to anus including perianal and perioral skin. The etiology is yet unknown. It may be autoimmune, pathogenic or due to allergens. It is seen more in males than females from late childhood to middle age. Only 0.5°/c patients developed oral lesions.

The characteristic features involve skip lesions from the mucosa to full thickness of bowel wall resulting in inflammatory exudate on serosal surfaces. There are noncaseating granulomas in bowel wall. The lesions outside G.I. are on the eyes, legs and are known as erythema nodosa. It may be related to immune conditions like rheumatoid arthritis, lupus, asthma and diabetes. The symptoms include recurrent abdominal pain, diarrhea, mucus and blood in stools. Recurrent bleeding causes iron deficiency anemia. The inflammation of the bowel wall causes narrowing of the lumen leading to blockage. Depending on the affected areas nutritional deficiencies like B 12 are seen if terminal ileum and ileocecal region is involved. Duodenum and jejunum m involvement causes generalized malabsorption and nutritional deficiency. Adhesion and fistula formation are common [1].

The oral manifestations show as lip swelling, angular cheilitis, oral ulceration, mucosal cobble stoning, full width gingivitis, geographic tongue and stomatitis. Granulomas go deep in muscle layer and biopsy may involve a risk of facial perforations. Fecal Calprotectin test is used for monitoring. Endoscopy and biopsy if used to confirm the diagnoses

The management of the disease is done with steroids like prednisone along with azathi opine, NSAIDS, enemas based on 5ASA. Lmiximab and adalimumab are used for more specific therapy targeted at cytokine TNF-alpha. Steroids should be used in reduced doses for children as it affects growth. Bowel resection is done to treat blockage of the bowel wall [2].

Ulcerative Colitis

It is an inflammatory bowel disease which involves the rectum and progresses towards the upper part of the colon. It can happen at an y age but more specifically seen in between 15 to 25 years of age and a small peak is seen from 55 to 65 years of age. The median age is around 32 years. Europeans have a higher incidence with 24.3 new cases per 100000 persons each year'. It is difficult to differentiate from Crohn's disease and sometimes is called indeterminate colitis. The characteristic feature of ulcerative colitis is Pyostomatitis vegetans. It involves multiple

military white or yellow pustules that coalesce in snail track ulcers with an ephemeron and edernatous base in mucosa. The symptoms are weight loss, fatigue, and bloody diarrhea with mucus and negative stool cultures. It is mainly mucosal inflammation and hence superficial [3].

The oral manifestations include glossitis, cheilitis, stomatitis, lichen planus, mucosal ulcers, diffuse pustules and nonspecific gingivitis. It is seen in 5 to 10°/c population. The treatment involves use of oral steroids, Dapsone, SASA based drugs, mesalazine, sulphasalazine and olsalazine. Ileostomy is needed in some cases. Antiseptic mouth rinse is given to avoid Candida infections such as dilute chlorhexidine or topical sugar-free nystatin.

CERD

It is an event which allows backflow of acids in esophagus and pharynx due to defective relaxation of lower esophagus sphincter. It can be associated with Helicobacter pylori, bulimia, hiatus hernia or chronic alcoholism. There is repeated regurgitation, nausea, heartburn, coughing, laryngitis, asthma and pneumonia. Infants and young children show irritability and arching of the back while feeding, feed refusal and show poor growth. Hemorrhage, Baretts esophagus and adenocarcinoma are complications of Gerd. Perimyolysis is seen in 17°/c children of 2 to 16 years of age group in a cohort study by O Sullivan et al in 1998. It is due to acidic food, beverages or contaminants, salivary flow, eating disorders and acid regurgitation [4].

The oral manifestations are erosion, sour taste, burning mouth, ulcers, mucositis, halitosis and xerostomia. 83.3*/c dental erosions related to GERD is seen in children. Erosion is seen mostly on palatal surfaces of posterior and anterior teeth. Errxled surfaces are smooth and shiny. Yellow color of the dentin is visible as enamel thins out or is worn off. Severe cases may require dental restorative treatment'. Diagnosis is confirmed through PH impedance or endoscopy. Treatment involves lifestyle changes like regular diet, weight loss, and correct sleeping position, avoid smoking, no late-night eating. Proton pump Inhibitors are useful for suppressing tooth erosion.

Gardner's Syndrome

It is an autosomal dominant disorder with defective chromosome [5]. The characteristics feature is intestinal polyposis which has a high risk of malignant transformation to adenocarcinoma. It affects other organ systems including skin, skeleton and soft tissues. The head and neck manifestations are seen in childhood and adolescence. It involves epidermoid cysts of skin of head and neck.

The oral manifestations include enostosis of jaw which is seen as bone expansion in radiographs. There is increased incidence of super nurnerary and unerupted teeth. They show an increased risk of odontomas. Osteornas showing focal expansion of the jawbone can be felt over the skin and mucosa. It is clinically visible. The treatment involves surgical removal of osteomas, odontomas and cysts. It can cause cosmetic and functional issues.

Peutz Jec. Hers Syndrome

It is an autosornal dominant disorder showing mutation of LKB I gene. It shows hamartomata's polyposis of small intestine. Oral manifestations include non-sun exposed freckles near lips and vermilion border. There are flat, brown, painless, pigmented intra oral lesions seen on the buccal and labial mucosa as well as the tongue. Lesions show mild acanthosis with elongation of rete pegs and increased pigmentation in keratinocytes and melanocytes without an increase in number of melanocytes. No specific treatment is required until cosmetic intervention is needed. Lasers is the treatment of choice.

Jaundice

Excess bilirubin in the blood results in the accumulation of bilirubin in tissues, including the oral mucosa causing a yellow discoloration. The severity of the yellow discoloration depends on the blood concentration of bilirubin and the duration of the problem. Bilirubin has an affinity for elastin, thus the mobile oral tissues with higher elastic content such as the lingual frenum and the soft palate are more severely affected. A yellowish to greenish pigmentation (biliverdin deposition) occurs in the teeth of children with hyperbilirubinemia during calcification, as may be seen in the primary teeth of biliary atresia patients. This is not seen in adults as teeth have already calcified. However, care should be taken in assessing a yellowish discoloration of the sofipalate in patients receiving or eating large amounts of vitamin A, which is stored in fat of small intestine'.

Malabsorption Conditions Affecting Hematopoiesis

GI diseases related to protein-caloric malnutrition or micronutrient malabsorption may have an effect on the oral tissues. The classical examples are iron malabsorption inducing iron deficiency anemia and vitamin B12 malabsorption in pernicious anemia. The first oral manifestation is atrophic glossitis in which the filiform and fungi form papillae on dorsurn of the tongue becomes atrophied. It's accompanied with burning sensation (gloss pyrosis). And milder cases, the atrophy is patchy, but more severe cases show involvement of the entire dorsurn. In very severe cases, there may be shallow, round to oval-shaped, persistent ulcers with bright red borders, clinically resembling aphthous ulcers but often responsive to appropriate replacement therapy. Affected patients are predisposed to developing angular cheilitis that can be treated with antifungal medication. The

gastroenterologist may use atrophic glossitis as an indicator of moderate to severe nutrient malabsorption. Treatment involves iron and B12 supplements.

Metastatic Disease to the Jaws

Malignant neoplasms of the liver and GI tract occasionally metastasize to the oral region, most commonly to the posterior mandible and usually through the hernatogenous route. Patients with mandibular intestates may be asymptomatic, or may complain of jaw or tooth pain, paresthesia (unilateral or bilateral numbness of the chin) or loosening of teeth. Initially, the neoplasm is sometimes found in a non-healing extraction socket afire a tooth has been extracted because of unexplained looseness. Less commonly, metastases may involve the maxilla or oral soft tissues.

Coeliac Disease

Coeliac disease is a small bowel disease usually seen in the jejunum. It is also known as gluten-sensitive enteropathy. It is an immune reaction to the alpha-gliaden component of gluten resulting in mucosal villous atrophy and loss of a large absorptive surface area in the small bowel. It can occur at any age but is most obvious in children. Coeliac disease is more common in patients with Down syndrome and type 1 diabetes, autoimmune thyroid disease, and in some racial groups. Northern European and Celtic populations seem particularly susceptible. This relates to the prevalence of HLA -DQ2 and 14 HLA-DQ8 genes in the populations affected.

An individual without coeliac disease has a 10°/e risk of the disease if it is present in a sibling or direct family member and is at 85°/c risk if it is in their identical twin. Gluten containing food should ideally be withheld until 6 months of age to reduce the risk of disease. They are at a higher risk for MALT inphoma'. Oral conditions such as aphthous ulcers, angular cheilitis, recurrent herpetic, lesions, caries, enamel hypnplasia, atrophic glossitis and glossodynia are seen. Investigation involves testing for antibodies in the blood. A positive test should lead to more specific tests for antigliadin antibodies and antiendorilysial antibodies. Positive results in these are significant. Endoscopy with jejunal biopsy is the most accurate test, but it is not usually performed unless there is evidence of growth failure together with an antibody profile which suggests coeliac disease.

Treatment Involves avoiding gluten in the diet completely which can enable proper functioning and reverse the adverse effects of malabsorption in the small bowel. Other than diet care must be taken as some lipsticks and medications can have gluten as fillers.

Cystic Fibrosis

Cystic fibrosis (CF) is a disease of the pancreas which significantly upsets normal digestion and absorption of nutrients. CF is caused by abnormal function of the CFTR protein, which regulates sodium and chloride movement across cell membranes resulting in highly viscous mucous secretions. The genetic abnormality underpinning CF is found in 1 in 25 people of European descent, but as it is a recessive condition, the condition is only found in 1 in 2500 live births in the European Union.

Thickened secretions cause ductal blockage in the pancreas and the bile duct leading to pancreatitis and cirrhosis of the liver. This damage is irreversible and can also lead to a form of diabetes unique to CF. Fat and the fat-soluble vitamins, such as A, D, E, and K often not absorbed well. The malabsorption of vitamin K can lead to bleeding issues in older patients with CF. Child patients with CF traditionally needed a high carbohydrate-rich diet to keep their calorie intake at adequate levels as fat-based energy sources were not absorbed. The treatment involves introduction of oral pancreatic enzyme supplements. Therapy to allow a normal CFTR protein to be synthesized by the body's cells has been achieved with virus carriers inserting the gene into cells.

These diseases clearly indicate a comprehensive knowledge of GI diseases and symptoms is needed to detect any disorders and make correct differential diagnosis which will serve as a helpful guide for both the dentist and the gastroenterologist in early diagnosis, treatment plan and management of these challenging manifestations to improve the health and well-being of the patient.

The severity, progress and prognosis of the disease can be monitored in the presence or extent of oral manifestations and successful management of GI diseases may be reflected in response of oral tissues.

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