

Evaluation the relation between the nutrient deficiency and oral manifestation in Najaf city.

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Abstract

The relationship between nutrition and oral health is multifaceted. Nutrition has both local and systemic impacts on the oral cavity. Nutrient deficiency may result in oral symptomatology. There are many factors effected the nutrient as age, sex, and pregnancy. Clinical manifestations of nutrient deficiencies can have a significant impact on the function of the oral cavity. Functional properties of the oral cavity include taste, salivation, mastication, and swallowing food. The study was carried out on 150 cases from hospitals and special clinics during period from December 2010 to May 2011 in Al – Najaf city. All patients had been involved in this study from both sexes, the age between 12 – 65 years (120 females and 30 males), females divided in pregnant women 50, the ages between 15 – 38 years and non-pregnant women 70, and the ages between 12 – 65 years. The mouth is frequently the mirror of the body involved in conditions that affect the skin or other multiorgan diseases. In many instances, oral involvement precedes the appearance of other symptoms or lesions at other locations. Dentists and health professionals must recognize the manifestations of these deficiencies consider their causes and provide early treatment to prevent further compromise in nutrition status and to promote optimal nutrition, oral and overall health

Introduction:

Nutrients are the constituents of food necessary to sustain the normal functions of the body. These compounds provide that needs both energy and essential molecules for growth and maintenance. Nutritional science investigates the metabolic and physiological responses of the body to diet. The sequences of biochemical steps through which substances in living things change from one form to another. With advances in the fields of molecular biology, biochemistry, and genetics, the study of nutrition is increasingly concerned with metabolism and metabolic pathways. The human body contains chemical compounds, such as water, carbohydrates (sugar, starch, and fiber), amino acids (in proteins), fatty acids (in lipids), and nucleic acids (DNA and RNA). These compounds in turn consist of elements such as carbon, hydrogen, oxygen, nitrogen, phosphorus, calcium, iron, zinc, magnesium, manganese, and so on. All of these chemical compounds and elements occur in various forms and combinations (e.g. hormones, vitamins, phospholipids, and hydroxyapatite). Factors that influence the amount of a nutrient required to meet the needs

1 – Age: the nutrients vary from infancy to adulthood. For example, adults required about 0.8g of protein per kg of body, whereas infants need over 2g per kg. 2 - Sex: for men are approximately 20% greater than those for women 3 – Other factors: for most nutrients are increased about 20 – 30 % above normal in pregnant and lactation women. Patients with injury or illness also show increased requirements for some nutrients. The relationship between nutrition and oral health is multifaceted. Nutrition has both local and systemic impacts on the oral cavity (1). While diet and eating patterns have a local effect on the teeth, saliva and soft tissues, the systemic impact of nutrition also has considerable implications and it gave a good assessment as

a component of comprehensive care. An adequate supply of nutrients is essential to the growth, development, and maintenance of tissues, effectiveness of the immune system, prevention of cell damage and, in general, to increased resistance to many chronic, and some infectious diseases (1,2). The oral cavity is often one of the first sites where nutrient deficiencies can be clinically noted. Clinical manifestations of nutrient deficiencies can have a significant impact on the function of the oral cavity. Functional properties of the oral cavity include taste, salivation, mastication, and swallowing food. Any alterations in the structure and function of the oral cavity may compromise intake and contribute to the development of a nutrient-deficiency state.

Development of Nutrient Deficiencies

The oral cavity is an important anatomical location with a role in many critical physiologic processes, such as digestion, respiration, and speech. It is also unique for the presence of exposed hard tissue surrounded by mucosa. The mouth is frequently involved in conditions that affect the skin or other multi-organ diseases. In many instances, oral involvement precedes the appearance of other symptoms or lesions at other locations. Nutrient deficiencies result from an imbalance of supply and demand, that is, when the supply of nutrients is inadequate to meet the demands of the body (3). Oral tissues, such as the gingiva (gums), bone, teeth, and muscles of mastication (chewing muscles), are living tissues, and they have the same nutritional requirements as any other living tissue in the body. A poor diet can have an injurious impact on health, causing deficiency diseases such as scurvy, health-threatening conditions like obesity and metabolic syndrome, and such common chronic systemic diseases as cardiovascular disease, diabetes, and osteoporosis(4). In contrast, when food is freely available, as in many industrialized societies, oral health may be compromised by both the continual exposure of the oral environment to food and the presence of chronic diseases. The diet not only affects the number and kinds of carious lesions (cavities), but also is an important factor in the development of periodontal disease (gum disease). The intra-oral manifestations may be reflected in altered integrity and appearance of the teeth, soft tissue, and tongue. Serum levels may not always reflect nutrient stores. If body stores are depleted, biologic and physiologic performance and cell functions of those cells dependent on the specific nutrient become altered (5).

Diet and nutrition play a key role in:

- Tooth development.
- Gingival and oral tissue integrity.
- Bone strength.
- Prevention and management of diseases of the oral cavity.

The medical history and presenting symptoms with physical examination is critical to detecting deficiency conditions and possible etiologies. Illness and infection can increase nutrient needs and thereby contribute to a deficiency. Bacterial and fungal infections in the oral cavity may alter tissue integrity, increase nutrient utilization. Inadequate intake may be due to functional difficulties such as poor dentition, tooth loss, xerostomia, and systemic disease, as well as psychosocial problems including lack of income, depression, and anorexia. A prolonged poor dietary intake due to ill-

fitting dentures and difficulties with mastication has been shown to result in inadequate intake of zinc, calcium, and B6 (6).

Malnutrition and Periodontal Disease:

Periodontal diseases, a group of infectious diseases which are mostly chronic, affect the supporting tissues of the teeth. Compromised host defense responses associated with malnutrition may make the periodontium more susceptible to infectious organisms that are a normal component of the oral flora. The acute phase protein response to tissue injury is impaired to varying degrees in malnourished individuals. During periods of malnutrition, the magnitude of the inflammatory response is limited, resulting in an impaired host response (7, 8). This could result in a greater amount of periodontal destruction, leading to a compromised dentition. Gingivitis, a form of periodontal disease, refers to inflammation of the soft tissue component of the periodontium. Periodontal (gum) diseases, including gingivitis and periodontitis, are serious infections that, left untreated, can lead to tooth loss. Periodontal disease can affect one tooth or many teeth. It is important to note that although some nutritional deficiencies (notably vitamin C and folate) can alter the disease process, periodontal diseases are not caused by these deficiencies nor can they be cured by nutrient supplementation alone (9,10). There are multiple causes of gingivitis including: chronic diseases such as diabetes; medications including phenytoin and calcium channel blockers, also some drugs, such as oral contraceptives, anti-depressants, and certain heart medicines, can affect your oral health; pregnancy, tobacco users also are at increased risk for periodontal disease, research proves that up to 30% of the population may be genetically susceptible to gum disease, there are certain times in a woman's life when extra care is needed—times when mature and change such as puberty or menopause, during these particular times, a woman's body experiences hormonal changes that can affect many of the tissues in body, including the gums, gums can become sensitive, and at times react strongly to the hormonal fluctuations. This may make the gum more susceptible to disease; stress is linked to many serious conditions such as hypertension, cancer, and numerous other health problems, also is a risk factor for periodontal disease. Spongy, red, bleeding and painful gingiva is also noted in scurvy, an advanced vitamin C deficiency disease. In severe gingivitis, the easy bleeding and soreness of the gingiva may make eating difficult and contribute to poor intake. Soft, nonirritating, temperate and mildly flavored foods and fluids should be provided to meet energy and nutrient needs. Historically, vitamin A deficiency (11) was cited as a cause of periodontal disease, that a deficiency of this vitamin is the cause of gingivitis. clinical manifestations of folate deficiency, however, may include gingivitis.

Effects of Nutrient Deficiencies on Tooth Development as Dental caries:

Teeth are made from protein matrix that is mineralized with collagen (requiring vitamin C), calcium, and phosphorus (requiring vitamins D and A). Dental caries infectious disease of teeth in which organic acid metabolites lead to gradual demineralization of enamel; proteolytic destruction of tooth structure as calcium and phosphorus, any tooth surface can be affected. The decay process was happened by plaque formation, sticky mix of microorganisms, protein, polysaccharides, and bacteria metabolizing fermentable carbohydrate produce acid. Acid production oral pH<5.5 allows tooth demineralization. Saliva function, rinses away food; neutralizes acid; promotes remineralization, Caries patterns, depend on cause. Streptococcus mutans—most common bacteria involved fermentable carbohydrate. Foods that do not contribute

to decay do not cause a drop in salivary pH, includes protein foods, eggs, fish, meat and poultry; most vegetables, fats, sugarless gums.

Oral Manifestations of Nutrient Deficiencies:

Nutrient deficiencies may contribute to abnormal color, topography, size and sensations

in the oral cavity (12), other causes of abnormal findings such as glossodynia and glossopyrosis (painful and burning tongue and soft tissue), dysgeusia (altered taste), angular cheilitis (painful, dry cracked corners of the mouth), and changes in appearance and texture of the tongue must also be evaluated. Abnormal findings may reflect oral manifestations of a myriad of systemic diseases, medications, disorders unique to the oral cavity, or a nutrient deficiency (13).

Tooth Loss and Dentures:

Tooth loss may affect ability to chew, relationship between loss of teeth and reduced intake of fruits and vegetables. Dentures are often ill-fitting (especially common after weight loss); problem foods included fresh fruits and vegetables, chewy and crusty breads and chewy meat like steak, saliva production decreases reduced chewing ability, lower calorie and nutrient intake occurs for many simple nutrition. Older, edentulous (having no teeth) patients who have had a stroke with the accompanying chewing and swallowing problems may be at significant nutritional risk, particularly if they are living alone and on a limited income. The broken jaw prevented the patient from chewing and swallowing which produced a significant nutritional risk.

Changes in the Tongue:

There are several changes that can occur on the tongue during nutrient deficiency states. A painful, magenta colored, atrophic, smooth tongue is noted during a riboflavin deficiency. Glossitis may also be evidence of a vitamin B6, folate or B12 deficiency. However, during a chronic folate deficiency, the tongue papillae will become atrophied, resulting in a shiny, smooth surface appearance. Glossitis with loss of filiform papillae may also be seen in individuals with iron-deficiency anemia. A niacin deficiency results in a raw beefy, bright red, swollen, and painful tongue. Glossodynia may also be present in diabetes, resulting in painful mastication and swallowing.

Altered Taste

Hypogeusia, or diminished taste, is noted in zinc deficiency. Other non-deficiency state causes of altered taste include radiation to the head and neck, diabetes mellitus, and Sjögren's syndrome. Taste should be conducted to determine which taste sensations remain. Diets should be tailored to highlight the remaining taste sensations and limit those foods or flavorings which are unacceptable.

Angular Stomatitis and Cheilosis

Stomatitis: inflammation of oral mucosa. Angular stomatitis (painful fissures at the corners of the mouth) and cheilosis (dry scaling of the lips and corners of the mouth) are common findings in riboflavin deficiency. Similar findings may be noted with niacin and B6 deficiency states. The similarity of these findings may be due to riboflavin's role in B6 and tryptophan (which is converted to niacin) metabolism.

Angular stomatitis, however, may be associated with iron deficiency anemia (14). Angular cheilitis, however, is often associated with fungal infections, lip-sucking, and dehydration (15).

Oral Manifestations of Systemic Diseases:

Diabetes Mellitus:

Diabetes mellitus is a systemic disease associated with delayed wound healing and oral manifestations which may alter nutrient intake and compromise nutrition status. Poorly controlled diabetes mellitus is associated with glossodynia, xerostomia, candidiasis, gingivitis, periodontitis and altered taste (16, 17, 18). Up to 30% of individuals over the age of 19 with type 1 diabetes have periodontal disease (18). Good oral health important in order for individuals to be able to consume a diet adequate for maintaining glycemic control. Good glycemic control through diet is essential to restore oral and overall health, and maximize patient response to dental procedures including surgery, denture placement and operative care. Individuals with diabetes should be referred to medical nutrition therapy. Diet counseling is extremely important prior to and following surgical or treatment procedures which may alter eating ability.

Renal Disease & Renal Transplant Patients:

Renal disease has significant dietary, nutritional and oral implications. Significant restriction of dietary protein, sodium, potassium, phosphorus and fluid intake is necessitated for management of patients with renal failure. Meanwhile, calorie and calcium intake, as well as other water soluble vitamins and iron, need to be increased to promote and maintain desirable body weight and nutritional status. Iron deficiency anemia, osteomalacia, and deficiencies of other water soluble vitamins may occur. Renal transplantation has evolved as the best treatment option for the patients with end-stage renal disease. Different oral problems arise in these patients, either as a direct consequence of drug-induced immunosuppression, or as a result drug pharmacokinetics. Oral health and nutrition status must be monitored in the management of the transplant patient (19). The immunosuppressive medications and steroids have oral- and nutrition-related results including impaired glucose tolerance, osteoporosis, osteopenia and compromised integrity of the oral cavity soft tissue. Vitamin and trace element supplements are prescribed to promote repletion of body stores. Calcium in particular is needed to prevent osteoporosis associated with steroid therapy. Dental appearance including ulcerative stomatitis, xerostomia, gingival hyperplasia (GH), and urea in the saliva may further compromise nutritional status and dietary intake. The high simple carbohydrate diet followed by individuals with end-stage renal disease combined with the presence of xerostomia increases risk of tooth decay. Rinsing the mouth or brushing teeth following all meals and snacks should be encouraged to minimize caries risk factors (20).

Pregnancy and Contraceptive pill:

The oral mucous membrane, especially the gingiva, may undergo changes during pregnancy which, from clinical and histological observations, should be termed pregnancy gingival hyperplasia, gingivitis beginning in the second or third month of pregnancy that increases in severity throughout the eighth month. During this time, some women may notice swelling, bleeding, redness or tenderness in the gum tissue; and nutrient deficiencies, diseases that interfere with the body's immune system may

worsen the condition of the gums. Such rare cases of hyperplasia mimic pregnancy gingival tumours (granuloma gravidarum) within the buccal cavity. The gingival changes observed occasionally in women taking oral contraceptives may also be due to hormonal causes.

Gastrointestinal Diseases:

Ulcerative colitis:

The oral cavity is the portal of entry to the gastrointestinal tract. Lined by stratified squamous epithelium, the tissues of the mouth are often involved when individuals have conditions affecting the gastrointestinal system. These may be immune-mediated or chemically mediated processes. Lesions may manifest in the oral cavity as diffuse labial, gingival, or mucosal swelling, aphthous ulcerations or superficial hemorrhagic ulcers (21). Aphthous ulcers or angular stomatitis occurs in many of patients. Chronic liver disease: Chronic liver disease impacts many systems of the body. The coagulation pathway is one such system. The liver synthesizes many of the clotting factors necessary for hemostasis. In addition, vitamin K, a fat-soluble vitamin, requires proper liver function to be adequately absorbed from the intestines. In patients with liver disease, the resultant impaired hemostasis can be manifested in the mouth as petechiae or excessive gingival bleeding with minor trauma. This is especially suggestive if it occurs in the absence of inflammation. Therefore, special care must be taken during any type of surgery, oral or otherwise; severe hemorrhage can happen as a result of the defects of clotting factors (22). The only manifestation of advanced liver disease visible in the oral mucosa is jaundice, which is the yellow pigmentation that results from the deposition of bilirubin in the submucosa.

Anemia:

The potential causes for reduction in oxygen-carrying capacity are legion. Fatigue and decreased resistance to infection are common systemic symptoms. The oral mucosa exhibit pallor. This pallor is a common and easily recognizable feature of anemia. Mucosal conditions, such as glossitis, recurrent aphthae, candidal infections, and angular stomatitis may be more common in patients with anemia. Glossitis may be the first sign of folate or iron or vitamin B12 deficiency. The tongue appears reddened, and the papillae are atrophic, producing a smooth appearance. Angular stomatitis is commonly caused by a candidal infection, and it has been linked to iron deficiency (23). If the anemia persists, resistance to infection may be decreased.

Drug-Induced Conditions:

Aphthous stomatitis:

Pharmacologic agents are among the most common causes of recurrent aphthous lesions, commonly known as canker sores. Some common culprits include nonsteroidal anti-inflammatory drugs (NSAIDs), nicorandil, but any drug can potentially produce an aphthous-like reaction. These ulcerations are round, crateriform, yellowish depressions surrounded by an area of erythema. The size varies from 1-3 mm. Patients may have outbreaks of multiple ulcerations at one time. These are usually quite painful but typically are self-limiting (24).

Xerostomia: Dry mouth, it may be seen in severe vitamin A deficiency states (12) and in protein calorie malnutrition. The primary causes of xerostomia include

medications, Sjögren's syndrome, diabetes mellitus, and radiation to the head and neck (16). Altered taste sensations are frequently reported by individuals with xerostomia (25). Inadequate salivary flow can also contribute to oral infections, including dental caries and glossopyrosis (16, 25). The most common adverse effect of many medications is dry mouth (hyposalivation or xerostomia). The reasons for this vary from medication to medication but can range from dehydration (e.g., with diuretics) to anticholinergic activity (e.g., with some antidepressants). Dry mouth has a number of consequences, increased risk of fungal infection, increased caries risk, and increased prevalence of traumatic ulceration due to lack of lubrication. Patients with severely impaired salivary flow also have difficulty with eating, swallowing, and speech. The former can result in decreased food intake and poor nutrition.

Inhaled steroids:

A frequent complication of inhaled steroids is candidiasis (sometimes called thrush). Patients experience overgrowth of candida species in correlation with the dose and the frequency of the steroid use. This growth is due to inhibition of the patient's normal immune function. Oral candidiasis is characterized by small, curdy-appearing whitish papules and plaques that can usually be wiped from the mucosa. The tissue beneath these plaques is often inflamed and may bleed. The infection is usually self-limiting, so steroid use can still continue (26).

Gingival enlargement (hyperplasia):

Gingival enlargement (often referred to as hyperplasia even though it is not a true hyperplasia) may occur because of congenital abnormalities, hormone abnormalities, or certain medications (27). The 3 most common drugs that can produce dramatic gingival hyperplasia are phenytoin, calcium channel blockers, and cyclosporine. A pre-existing condition of gingival inflammation, resulting from poor oral hygiene, can predispose the patient to, or exacerbate, existing enlargement. Gingival hyperplasia develops in approximately half the patients taking phenytoin (28, 29). The anterior gingiva is the most common site of enlargement, although it may occur anywhere. Changes typically begin in the first 3 months after the initiation of therapy, but they may develop within 2 weeks.

Candidiasis:

Fungal and viral infections which can affect mouth and esophagus causing pain and dysphagia. Oral candidiasis is often the first presenting sign of HIV infection, and it may occur in as many as 90% of patients infected with human immunodeficiency virus (HIV). HIV infection should be considered in patients presenting with repeated oral candidiasis in the absence of other associated risk factors, such as steroid or antibiotic use.

Under nutrition and Oral Health:

Although oral diseases associated with vitamin deficiencies are rare in the United States and other industrialized countries, they may be common in emerging "third-world" nations. In these countries, the limited supply of nutrient-dense foods or the lack of specific nutrients in the diet (vitamin C, niacin, etc.) may produce characteristic oral manifestations. In addition, unusual food practices, such as chewing sugar cane throughout the day or other regional or cultural nutritional practices may

decrease the oral health of specific populations. Under nutrition may produce characteristic signs and symptoms in the oral cavity. For example, in a typical B vitamin deficiency, a person may complain that the tongue is red and swollen and "burns" (glossitis), that changes in taste have occurred, and that cracks have appeared on the lips and at the corners of the mouth (angular cheilosis). In a vitamin C deficiency, petechiae (small, hemorrhaging red spots) may appear in the oral cavity, as well as on other parts of the body, especially after pressure has been exerted on the tissue. In addition, the gums may bleed upon probing with a dental instrument. In humans, calcium deficiency causes the production of hypoplastic enamel (poorly mineralized enamel) similar to the osteoporosis produced in bone. Teeth appear to have a biological priority over bone when calcium is limited in the diet. Inflammatory bowel disease may cause deficiencies of fat, and water soluble vitamins including A, D, E, B6, B12, folate, C, trace elements, calcium, zinc, and magnesium due to altered digestion and absorption.

For wired or broken jaw provide pureed, strained, or blenderized foods as appropriate, encourage nutrient-dense foods such as blenderized casseroles, recommend small, frequent meals with oral supplements such as milkshakes, instant breakfast, medical nutritionals, use liquid vitamin supplement if necessary, recommend patient weight self to monitor weight status

Material and Method:

The study was carried out on 150 cases from hospitals and special clinics during period from December 2010 to May 2011 in Al – Najaf city. All patients had been involved in this study from both sexes, the age between 12 – 65 years (120 females and 30 males), females divided in pregnant women 50, the ages between 15 – 38 years and non-pregnant women 70, and the ages between 12 – 65 years. The blood sample was collected from patients for analyzed to knowing the type of vitamin or any group deficiency, the patients were include poor and low socioeconomic style life.

A – Dental caries only: Forty – five cases were obtained from patients (35 females and 10 males), the ages range between 12 – 50 years.

B – Periodontal disease + dental caries: Eighty cases were diagnosed clinically and dental X – ray (70 females and 10 males), ages range between 15 – 50 years.

C – Bone Defect: Thirteen cases were diagnosed clinically and by X – ray (4 females and 3 males), age was range between 50 – 65 years.

D – Another diseases of oral cavity: This group consists of twelve patients (11 females and 7 males), ages range between 20 – 50 years.

Results and Discussion:

The results of this study showed that the people in the Najaf city they do have we founded there are many factors that affected the nutrient and then affected the oral manifestation later. These factors explained in tables below.

Table 1: Groups and the number of the patients.

Age group	Male	Non – pregnant female	Pregnant female	Total
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12 – 65 y	30	70	50	150
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Table 2: The patients according to type of diseases.

Type-of disease	Age group	Male	Non– pregnant female	Pregnant-female	Total
Dental---caries only	12 – 50	10	20	15	45
Periodontal disease + dental caries	15 – 50	10	35	35	80
Bone defect	50 – 65	3	4	0	7
Another diseases	20 – 65	11	7	0	18
Total	12 – 65	34	66	50	150

Table no. 3: Nutrition Risk Factors to Consider in Clinical Examination

Oral Cavity Area	Clinical Manifestation	Nutrient Deficiencies
Lips	Cheilosis, Angular fissures	Niacin, B6, riboflavin, iron
Gingiva	Spongy, bleeding, abnormal redness	Vitamin C
Tongue	Glossitis, (red, raw, fissured), Pale, atrophic, smooth/slick (filiform papillary atrophy) Magenta color	Folate, niacin, iron, B6, Iron, folate riboflavin

Table no. 4: Local and systemic causes of nutritional deficiencies.

1 – Anemia	10 – Kidney transplant	19 – Soft tissue abnormality
2 – Corticosteroids drugs	11 – Medication	20 – Stress
3 – Depression	12 – No sun light	21 – Starvation
4 – Diabetes mellitus	13 – No money for eat or low socioeconomic	22 – Tooth loss
5 – Diet reduced as regime	14 – Oral contraceptive pill	23 – Tobacco
6 – Fungal infection	15 – Pregnancy	24 – Ulceration in the mouth
7 – Genetic or inherited diseases	16 – Poor dentition	25 – Vascular disease
8 – Hormonal changes for puberty or post menopause	17 – Radiation therapy	26 – Vitamins deficiency
9 – Inflammatory bowel disease	18 – Renal disease	27 – Xerostomia

Table no. 5: Abnormal Oral Findings Associated With Local and Systemic Disease

Clinical Feature	Associated Finding	Associated Disorder	Nutritional Considerations
Difficulty biting \ chewing food	Partial or total edentulous Lack of occlusion ill-fitting dentures	Bone defect, Abnormal occlusion	Modify diet consistency, Loss of anterior occlusion- modify for difficulty biting, Loss of posterior occlusion – modify for difficulty chewing
Burning of mouth	May be with or without associated erythema edema (stomatitis)	Anemia, Diabetes, Candidiasis	Determine etiology of deficiency, Determine cause of poor glucose control, modify diet, evaluate cariogenicity, evaluate for dysgeusia, dysphagia
Burning of the tongue	Glossitis, Pale, atrophic, smooth tongue	deficiency of iron, folate, B6, niacin, and/or riboflavin deficiency of iron, folate, B12	Determine etiology; treat with diet and/or supplements as needed. The same above
Angular fissures of mouth (stomatitis) lips	Drug - induced Dry, cracked lips	Niacin, riboflavin, B6, iron deficiency, dehydration,	Determine the etiology.
Xerostomia	Dental caries Candidiasis	Drug – induce Xerostomia	Push fluids; evaluate cariogenicity of diet, Modify food consistency and choices to reduce pain (limit spicy, hot, acidic, and

	Burning mouth and tongue	Connective tissue disorder. Diabetes	seasoned foods). Evaluate masticatory efficiency and modify food choices. Evaluate glucose control, modify diet.
Bleeding tendency	May be with or without associated edema	Anemia, Diabetes	Determine etiology of deficiency, Determine cause of poor glucose control.
Pain	Dental caries Candidiasis Burning mouth and tongue	Calcium deficiency, Drug - induce Connective tissue disorder.	evaluate cariogenicity of diet, Modify food consistency and choices to reduce pain. Evaluate masticatory efficiency and modify food choices.

Table no. 6: Effect of Nutrient Deficiencies on Tooth Development

Nutrient	Effect on tissue	Effect on caries
Protein /calorie malnutrition	Delay tooth eruption Decrease tooth size Decrease enamel solubility Salivary gland dysfunction	Yes
Vitamin D/ calcium/ phosphorus	Lowered plasma calcium level Hypomineralization (hypoplastic defect) Compromised tooth integrity (decrease minerals concentration) Delay eruption pattern.	Yes
Vitamin A	Decrease epithelial tissue develop Tooth morphogenesis dysfunction. Decreased odontoblast differentiation Increased enamel hypoplasia.	Yes
Vitamin C	Dental pulpal alteration Odontoplastic degeneration Aberrant dentine	No
Iron	Slow growth, salivary gland dysfunction	Yes

In this clinical study, the total number of these cases was 150; all of them were suffering from one or more of the following signs and symptoms as pain, bleeding tendency of gingiva, ulceration, loss of taste, burning sensation of tongue, difficulty in eating and swallowing, bad odor, decrease saliva, mobility of teeth, ugly teeth as discoloration, and those with dental caries for filling, extraction, and the lowest for the prophylaxis. These cases were including the following:

Patients with dental caries, periodontal diseases, diabetes mellitus, kidney disease and kidney transplantation, drugs induced problem, bowel diseases, liver diseases, patient was taken chemotherapy, and Poor patient with low socioeconomic and patient doing diet regime. The mouth is frequently the mirror of the body involved in conditions that affect the skin or other multiorgan diseases. In many instances, oral involvement precedes the appearance of other symptoms or lesions at other locations. Nutrition risk evaluation was part of the scope of practice of all health professionals; early detection of risk for nutrient deficiencies during medical or dental exams, recognition of oral manifestations of nutrient deficiencies and other diseases (30,31,32). There is a clear relation between oral health and nutrition; nutrition plays a crucial role in maintaining the integrity and normal function of the oral cavity (32). Nutrient deficiencies and oral manifestations of disease which alter that integrity contribute to compromised dietary intake, resulting in deficiency states, malnutrition and poor wound healing following procedures or surgeries. In our study we were found that many systemic conditions are known to adversely affect the mouth or teeth, and these patients require additional oral care and management so a dental evaluation should accompany the medical and psychological evaluation of a suspected eating disorder. The diet of early modern humans varied significantly depending on location and climate. The diet in the tropics tended to be based more heavily on plant foods, while the diet at higher latitudes tended more towards animal products (33). In our study especially our city due to social behaviors and due to religious reasons, because our women must cover all the body with black cloths, and wear a veil and sometimes black gloves when they go outdoors. These factors act as a good reason for preventing the cutaneous production of vitamin D in those women, even when they live in a sunny climate. In veiled Moslem women indicates that, in the absence of sunlight exposure. This issue also was discussed as, they reported that “people of cultures such as Bedouins living in the Nagged Desert, who are required to have most of the skin surface covered by clothing, are prone to develop vitamin D deficiency” (34). Inadequate nutrition in the period from conception to approximately 12 years of age can affect the formation of enamel, causing pits and areas of roughness and these can be more susceptible to decay. Research demonstrates that stress can make it more difficult for the body to fight off infection, including periodontal diseases; a diet which low in important nutrients can compromise the body's immune, already know, tobacco use is linked with many serious illnesses such as cancer, lung disease and heart disease, as well as numerous other health problems. You've probably heard a few old wives' tales about pregnancy, including “A tooth lost for every child.” While it seems far-fetched, it actually is based loosely in fact. Careful periodontal monitoring and excellent oral hygiene is especially important for women who may be noticing changes in their mouths during times of hormonal fluctuation. To help ensure good oral health, Women often become anemic during pregnancy because the demand for iron and other vitamins is increased. The mother must increase her production of red blood cells and, in addition, the fetus and placenta need their own supply of iron, which can only be obtained from the mother. As

mentioned, lifestyle- and obesity-related diseases are becoming increasingly prevalent all around the world. There is little doubt that the increasingly widespread application of some modern food processing technologies has contributed to this development. The food processing industry is a major part of modern economy, Research indicates that improving the awareness of nutritious meal choices and establishing long-term habits of healthy eating have a positive effect on cognitive and spatial memory capacity, potentially increasing a student's potential to process and retain academic information. Nutrition is taught in schools in many countries. In England and Wales the Personal and Social Education and Food Technology curricula include nutrition, stressing the importance of a balanced diet. However, statistics collected by the World Health Organization from 1990-2000 show in France may have been underestimated and, in fact, may be similar to that of neighboring countries(35). In 1992, The U.S. Department of Agriculture introduced the Food Guide Pyramid. In 2002, a Natural Justice study showed a relation between nutrition and violent behavior. In 2005, a study found that obesity may be caused by adenovirus in addition to bad nutrition(36). Dietary and physical activity guidelines from the USDA are presented in the concept of a food pyramid, which superseded the Four Food Groups. The U.S. Department of Health and Human Services provides a sample week-long menu which fulfills the nutritional recommendations of the government (37).

Conclusion:

- 1 - The dentist must have a good experiences and social communication, and competence and caring for the patients.
- 2 - It is important for physicians to recognize the link between systemic disease and oral findings. Some systemic conditions may first manifest with oral findings and a trained physician may detect and diagnose these conditions earlier, thereby initiating treatment sooner.
- 3 - Patients experiencing this side effect should be monitored and encouraged to maintain good oral hygiene and frequent dental visits.

References

1. American Dietetic Association. Position of The American Dietetic Association: Oral health and nutrition. J Am Diet Assoc 1996; 96(2):184-189.
2. Navia J. A new perspective for nutrition: The health connection. Am J Clin Nutr 1996; 61(Suppl):407S-409S.
3. McClaren DS. Chapter 55: Clinical manifestations of human vitamin and mineral disorders: A resume. In: Shils ME, Olsen JA, Shike M, editors. Modern nutrition in health and disease. 8th ed. Philadelphia: Lea and Febiger; 1994. pp. 909-923.
4. Long RG, Hlousek L, Doyle JL. Oral Manifestations of Systemic Disease. Dermatol Clin. 1998; 65:309-315.
5. Beaton GH, Patwardhan VN. Physiological and practical considerations of nutrient function and requirement. In: Beaton GH, Bengoa JM, editors. Nutrition and preventive medicine. Geneva: World Health Organization Monograph Series No.62; 1976. pp. 445-481.

6. Sebring NG, Guckes AD, Shou-Hua L, McCarthy GR. Nutritional adequacy of reported intake of edentulous subjects treated with new conventional or implant-supported mandibular dentures. *J Prosthet Dent* 1995; 74:358-363.
7. Enwonwo CO. Interface of malnutrition and periodontal diseases. *Am J Clin Nutr* 1995; 61(Suppl):430S-436S.
8. Enwonwu C. Cellular and molecular effects of malnutrition and their relevance to periodontal diseases. *J Clin Periodontol* 1994; 21:643-657. Oral Manifestations of Nutrient Deficiencies— Touger-Decker
9. Ismail AI, Burt BA, Eklund SA. Relation between ascorbic acid intake and periodontal disease in the United States. *J Am Dent Assoc* 1983; 107:927-931.
10. Leggott PJ, Robertson PB, Jacob RA, et al. Effects of ascorbic acid depletion and supplementation on periodontal health and subgingival microflora in humans. *J Dent Res* 1991; 70(12):1531-1536.
11. Shaw JH. The relation of nutrition to periodontal disease. *J Dent Res* 1962; 41(Suppl):264-274.
12. Dreizen S. Dietary and nutritional counseling in the prevention and control of oral disease. *Compend Contin Educ Dent* 1989; 10(10):558-563.
13. Touger-Decker R, Sirois D. Physical assessment of the oral cavity. *Support Line* 1996; 18(5):1-3.
14. Sweeney MP, Bragg J, Fell GS, Yip B. The relationship between macronutrient depletion and oral health in geriatrics. *J Oral Pathol Med* 1994; 23:168-171.
15. Brightman VJ. Red and white lesions of the oral mucosa. In: Lynch MA, Brightman VJ, Greenberg H, editors. *Burket's oral medicine, diagnosis and treatment*. 9th ed. Philadelphia: J.B. Lippincott Co.; 1994.
16. Touger-Decker R, Sirois D. Chapter 33: Dental health. In: Powers M. *Handbook of diabetes medical nutrition therapy*. Baltimore: Aspen Publishers; 1996. pp. 638-648.
17. Emrich LS, Shlossman M, Genco RJ. Periodontal disease in non-insulin dependent diabetes mellitus. *J Periodontol* 1991; 62:121-131.
18. Centers for Disease Control. National diabetes fact sheet. November 1, 1997. Atlanta: Centers for Disease Control; 1997 Nov. 1 (www.cdc.gov).
19. US Renal Data System (USRDS). 2007 Annual Data Report: Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States. Bethesda, Md: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases; 2007. Available at http://www.usrds.org/reference_2007.htm. Accessed June 13, 2011.
20. Darwazeh A.M., Jordan University of Sciences and Technology, Irbid, Jordan, and M.A. MOHAYA, Saudi National Guard Dental Services, Riyadh, Saudi Arabia Oral and Dental Hygiene. The Preliminary Program for First African and Middle-East IADR Federation Conference (September 27-29, 2005)

21. Handlers JP. Oral manifestations of gastrointestinal disease. J Calif Dent Assoc. Apr 1999;27(4):311-7. [Medline].
22. Chuang TY, Stitle L, Brashear R, Lewis C. Hepatitis C virus and lichen planus: A case-control study of 340 patients. J Am Acad Dermatol. Nov 1999;41(5 Pt 1):787-9. [Medline].
23. Caldemeyer KS, Parks ET, Mirowski GW. Langerhans cell histiocytosis. J Am Acad Dermatol. Mar 2001;44(3):509-11. [Medline].
24. Casiglia JM. Recurrent aphthous stomatitis: etiology, diagnosis, and treatment. Gen Dent. Mar-Apr 2002;50(2):157-66. [Medline].
25. Rhodus NJ, Brown J. The association of xerostomia and inadequate intake in older adults. J Am Dietet Assoc 1990; 90(12):1688-1692.
26. Hanania NA, Chapman KR, Kesten S. Adverse effects of inhaled corticosteroids. Am J Med. Feb 1995;98(2):196-208. [Medline].
27. Meraw SJ, Sheridan PJ. Medically induced gingival hyperplasia. Mayo Clin Proc. Dec 1998;73(12):1196-9. [Medline].
28. Silverstein LH, Koch JP, Shatz PC. Nifedipine-induced gingival hyperplasia. Am Fam Physician. Mar 1996;53(4):1069-70. [Medline].
29. Wahlstrom E, Zamora JU, Teichman S. Improvement in cyclosporine-associated gingival hyperplasia with azithromycin therapy. N Engl J Med. Mar 16 1995;332(11):753-4. [Medline].
30. Heymsfield SB. Nutrition support at the scientific frontier. J Parenter Enteral Nut 1997;21(5):252-258.
31. American Dietetic Association. Position of the American Dietetic Association: Nutrition Education of Health Professionals. J Am Diet Assoc 1998; 98(3):343-346.
32. American Dietetic Association. Position of the American Dietetic Association: Oral health and nutrition. J Am Diet Assoc 1996; 96(2):185-189.
33. Villa P, Bouville C, Courtin J, et al. (July 1986). "Cannibalism in the Neolithic". Science 233 (4762): 431-7. doi:10.1126/science.233.4762.431. PMID 17794567
34. Taha S.A., Dost S.M., Sedrani S. H.: 25- Hydroxy vitamin D and total calcium . Extraordinarily low plasma concentrations in Saudi mothers and their neonates. Pediatr, Res; (1984) 18 : 739-741.
35. Ducimetière P, Lang T, Amouyel P, Arveiler D, Ferrières J (January 2000). "Why mortality from heart disease is low in France. Rates of coronary events are similar in France and Southern Europe". BMJ 320 (7229): 249-50. doi:10.1136/bmj.320.7229.249/a (inactive 2010-03-17). PMC 1117444. PMID
36. Red Book: Report of the Committee on Infectious Disease. American Academy of Pediatrics. 2006; Pickering LK (editor): 831-835.

37. US Department of Health and Human Services. Oral health in America: A Report of the Surgeon General. Rockville MD: US Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000. Available online at <http://www.nidcr.nih.gov/DataStatistics/SurgeonGeneral>. Accessed January 18, 2007.

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الخلاصة:

علاقة التغذية مع صحة الفم ذات اسباب متنوعة. التغذية لها أثر في الفم موقعي وشامل، اما نقص الغذاء فله اعراض مرضية في الفم. توجد عوامل مهمة تؤثر في التغذية منها العمر، الجنس، والحمل. الأعراض السريرية لنقص الغذاء له تأثير واضح في وظائف الفم ومنها التذوق، افراز اللعاب، مضغ الأكل والبلع. الدراسة اجريناها على 150 حالة في المستشفى والعيادة الخاصة في محافظة النجف الأشرف من شهر تشرين الثاني 2010 لغاية شهر أيار 2011 ، المرضى في هذه الدراسة من كلا الجنسين (نساء و رجال)، بأعمار تتراوح ما بين 12 – 65 سنة، وتتضمن الدراسة نساء حوامل تتراوح اعمارهن ما بين 15 – 38 سنة، و نساء غير حوامل تتراوح اعمارهن ما بين 12 – 65 سنة. يعتبر الفم مرآة الجسم و من خلاله تظهر اعراض الأمراض التي تصيب الجسم في أي مكان. طبيب الأسنان و المختص بالصحة يجب ان يعرف كيفية تشخيص هذه الأعراض لأجل علاج نقص التغذية بأسرع وقت للحفاظ على صحة الفم و الجسم.