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Aakash Healthcare Pvt. Ltd.
Dwarka

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On

AWARENESS ABOUT INTERRELATIONSHIP BETWEEN SYSTEMIC DISEASES AND ORAL FOCI

A Report
By

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New Delhi

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At the onset of my report, I would like to acknowledge my sincere thanks to our institute, Institute of Health Management and Research, Delhi for providing us platform to gain enough knowledge and skills in different aspects of hospital management.

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Finally, and most importantly, I would like to thank God for allowing me to complete my project, my beloved parents for their blessings and my friends for their help and wishes for the successful completion of this training.

Thanking You

Karamjit Kaur Ralh

IIHMR Delhi

S.No	ACRONYMS	ABBREVATIONS
1	ICU	Intensive care unit
2	MRI	Magnetic resonance imaging
3	CT	Computed tomography
4	COPD	Chronic obstructive pulmonary diseases
5	DM	Diabetes mellitus
6	IL	Interlukin
7	CRP	C – reactive protein
8	PGE2	Prostaglandin E2
9	TNF	Tumor necrosis factor

1 ABOUT THE ORGANIZATION

About Aakash Group:

Mr. J.C. Chaudhry, the Chairman of Aakash Institute started teaching with one institute in 1988 with 12 students. Today after 28 years of perseverance and excellence, Aakash is a household brand, with more than 150 centers across the country, training more than 125,000 students every year, turning them into accomplished medical and engineering professionals.

Aakash Heathcare is a subsidiary of the Aakash Group, and is a state of the art healthcare facility and the first smart hospital in this part of the city. Our patient-centric policy, erudite doctors and compassionate staff offer the best in class healthcare for everyone. Healthcare was a palpable choice for the parent organization, since this sector shall benefit the institute's enormous alumni network spread across continents.

1.1 ORGANIZATION PROFILE

About Aakash Healthcare:

VISION

To become the most desired healthcare brand by providing compassionate, caring and world class services with the help of talented team of doctors, professionals and latest technology

MISSION

To achieve highest patient satisfaction index by delivering patient-centric, best healthcare services amongst the local and the extended community

VALUES : ICARE

I - Integrity

C – Compassion

A – Accountability

R – Respect

E - Excellence

In the month of November 2011, Dr. Aashish Chaudhry envisioned a smart orthopedic clinic for the people of Dwarka, New Delhi, which is Asia's biggest residential colony. The clinic thrived

as a result of his ethical and transparent healthcare practices, and in present-day Dr. Chaudhry is a celebrated orthopedic surgeon, having performed innumerable successful orthopedic surgeries, giving agility and the ease of movement to the incapacitated.

Aakash Healthcare is a super specialty hospital, with state of the art infrastructure, path breaking technology, offering unrivalled healthcare services. Dr. Aashish Chaudhry, the founder and Director of Aakash Healthcare, aims to make Aakash Healthcare the most preferred healthcare brand by providing compassionate, inexpensive, and world class healthcare services, with a talented team of doctors, and ultra modern technology, ensuring speedy recovery.

INFRASTRUCTURE HIGHLIGHTS

- 230 Beds in Phase 1
- 70 Bedded Medical and Surgical Critical Care Unit.
- 24x7 Cardiac Emergency & Trauma Services.
- 15 Bedded Dialysis Unit.
- Advanced Neonatal ICU.
- Ward Bed Options - Suite, Deluxe, Twin Sharing and Economy.
- 8 Modular OTs.
- Flat Panel Cath Lab.
- State-of-the-art diagnostic equipments that include - 3.0 Tesla MRI, 128 slice CT scan, Flat panel C-Arm, and 4-D Ultrasound to name a few.
- Automated Waste & Laundry Management System for efficient waste management.
- Pneumatic Chute System.

The board of directors are Mr. J C Chaudhry, Mrs. Kamla Chaudhry and Dr. Aashish Chaudhry**.**

CHAIRMAN

Mr. J.C. Chaudhry is the founder and MD of Aakash Institute & chairman of Aakash Healthcare Pvt. Ltd.

The institute started in 1988 with 12 students and today it is a household brand throughout the country with 150 centers and 150,000 students.

MANAGING DIRECTOR

Dr. Aashish Chaudhry is the managing director of Aakash Healthcare Pvt. Ltd. A celebrated Orthopaedic Surgeon.

- Postgraduate in Masters of Surgery in Orthopedics from Lady Hardinge Medical College.

- Ex Joint Secretary, Indian Orthopedic Association (Session 2009-2011);

- Fellowship status with American College of Surgeons (F.A.C.S.); International College of Angiology (F.I.C.A.), New York, USA and Indian Medical Association (F.I.M.A.)

Dissertation Report

TOPIC OF RESEARCH:

Interrelationship between systemic diseases and oral foci

2.1 *INTRODUCTION*

- Oral focal infection is when microorganisms from the oral cavity cause diseases in other locations of the body.
- Focal infection is a localized or generalized infection caused by the dissemination of microorganisms or toxic products from a focus of infection. Oral foci occur because of Pyrorrhea alveolaris (periodontitis), alveolar abscesses, general oral sepsis and endodontically treated teeth. Focus of infection refers to a circumscribed area of tissue, which is infected with pathogenic microorganisms and is usually located near a mucous or cutaneous surface.The oral cavity can act as gateway for microorganism to access the distant body organ through dissemination by taking advantage of compromised immunity. Specific pathologic conditions of oral cavity may create foci of infection that can affect many other vital systems, such as cardiovascular and renal systems.
- The microenvironment of the oral cavity changes with the age of the patient, the eruption or loss of teeth. Pregnancy, hormonal changes or drug intake alter the number and proportion of flora. These changes are due to alterations in the flow and composition of salivary fluid and activity of defense components (e.g. Immunoglobins, cytokines) in the saliva. Periodontal disease allows organisms to enter deep systemic tissues.

3. RELATIONSHIP BETWEEN ORAL DISEASES AND SYSTEMIC DISEASES:

- Three mechanisms or pathways linking oral infections to systemic manifestations have been suggested:
- Metastatic infection – Oral infections and dental procedures can cause transient bacteraemia. Microorganisms that enter the bloodstream and circulate throughout the body, they are normally eliminated within minutes by the reticuloendothelial system. They usually cause a slight increase in body temperature. However, they may settle at a particular site, finding favourable conditions and after a time lag begin to multiply.
- Metastatic injury: Certain gram -positive and negative bacteria have the ability to produce diffusible proteins or exotoxins.They include cytotoxic enzymes and dimeric

toxins having A and B subunits. Exotoxins are considered to be lethal. Endotoxins which are lipopolysaccharides are part of the outer membranes are released after death of the cell and cause various pathologic manisfestations. They are shed continuously from periodontal gram – negative rods during their growth invivo.

- Metastatic inflammation: A macromolecular complex may form when a soluble antigen enters the bloodstream and reacts with circulating specific antibody.These immune complexes may cause various acute and chronic inflammatory reactions at their site of deposition.

2.1.1 **Background**

Focal infection is a localized or general infection caused by the dissemination of microorganisms or toxic products from a focus of infection. It has been observed that "foci" of sepsis were responsible for the initiation and progression of a variety of systemic diseases. Certain microorganisms are normally present in the oral cavity which have led to a more accurate assessment of the importance of oral focal infection.

Oral cavity may be sources of infection and set up distant metastases through infected periapical lesions (periapical granuloma, periapical cysts,periapical abscess),teeth with infected root canals and periodontal diseases with special reference to tooth extraction. A number of epidemiological studies have shown that oral infection,especially marginal and apical periodontitis may be a risk factor for systemic diseases as they are the most common oral infections.

Periodontal diseases are a group of bacterial infections and inflammatory diseases that result in destruction of tooth –supporting tissue ,including the gingival ,alveolar bone and the teeth themselves ,which may eventually cause tooth loss. It is most commonly associated with Actinobacillus actinomycetemcomitans, Porphyromonas gingivalis and Bacteroides forsythus

Oral cavity can act as the site of origin for pathogenic microorganisms to disseminate to other distant sites of the body,especially in immunocomprised patients such as those with malignancies ,rheumatoid arthritis , diabetes .The only non- shredding surfaces of our body are teeth and bacterial levels can reach to about 10^{11} microorganisms/mg of dental plaque. Periodontal and endodontic infections are frequently associated with complex microflora of which many are anaerobic gram negative rods. Bacteremia following dental procedures like

tooth extraction ,endodontic therapy and scaling are documented.There are various barriers in the oral cavity that prevent bacterial penetration into the tissue from dental plaque. These include oral epithelium acting as a physical barrier; defensins ,host –derived antibiotics ; immunological barrier of antibody – forming cells and the reticuloendothelial system. Under normal conditions , these barrier mechanisms act together to prevent and eliminate invading bacteria. When this state of equilibrium id disturbed by a breach (e.g Trauma,neutropenia,AIDS,immunosuppressant therapy) , microorganisms can propagate and cause infections at distant sites of the body. When oral hygiene is poor ,the prevalence and magnitude of bacteremia can increase several fold.

2.2PROBLEM STATEMENT

It is generally known that a patient's oral status is connected with their systemic health, as poor oral health may cause systemic diseases . It has been reported that there is a relationship between systemic diseases and oral infections. A chronic oral infection such as periodontitis is a constant potential source of infection and has been considered a separate risk factor for cardiovacular diseases,cerebrovascular diseases ,peripheral arterial disease ,respiratory diseases and low birth weight ,osteoporosis. Some of these conditions may in turn increase the incidence and severity of periodontal disease by modifying the body's immune response to periodontal bacteria and their by-products . There is a bi-directional relationship between periodontitis and systemic diseases.

The aim of this study to assess the knowledge level of employees whether they know the association between systemic diseases and oral infections because this may exacerbate their general health.

2.3 NEED OF THE STUDY

The relationship between periodontitis and other pathological conditions could be established by the immunogenic potential of host and/or bacterial products that reach the bloodstream and target distant organs and systems. Therefore oral infections may aggravates the general health and it may increase the risk of mortality. This study will help in identifying the awareness of relationship between systemic disease and oral infections.

REVIEW OF LITREATURE

1. **LONG TERM CONTROL OF DIABETES MELLITUS AND PERIODONTITIS:**

Study was conducted by Tellervo Tervonen and Richard C. Oliver to evaluate the association between long term control of diabetes mellitus and periodontitis. A total of 75 diabetics(type I or type II)aged 20 -70 years with long term records of their diabetic control were selected for the study. The periodontal variables were recorded in a randomized half mouth examination , plaque, calculus . An increase in the prevalence , severity and extent of periodontitis with poorer control of diabetes was observed . The extent of calculus also increased with poorer control. This study concludes that periodontitis in diabetics is associated with long term metabolic control and presence of calculus. Therefore, regular maintenance care including patient motivation and instruction as well as professional calculus removal is important for diabetic patients.

2. **ASSOCIATION BETWEEN PRETERM AND LOW –BIRTH WEIGHT WITH PERIODONTAL DISEASE: CASE CONTROL STUDY**

A case – control study was done by Nayyereh Khadem, Mohammad Ebrahim Rahmani , Milneh Afiat on 70 women (mean age 25.1 years) 35 women with preterm delivery, gestational age < 37 weeks and birth weight <2500 grams as case group and 35 women with term delivery , gestational age >37 weeks and birth weight >2500 grams as control group . Mean probing depth (MPD) , percent of sites with more than 3mm in probing ,Bleeding Index (BI) , Plaque Index(PI) and extent & severity index were measured using a mirror and a standard William's periodontal probe. Significant difference was seen in case and control groups. This study concludes that gum disease can be a risk factor for preterm delivery.

3. **ASSOCIATION BETWEEN DENTAL HEALTH AND ACUTE MYOCARDIAL INFARCTION.**

A case – control study was conducted by K.J. Mattila , M.S. Nieminen , V.P. Rasi P.S. Jungell to examine the role of chronic bacterial infections as risk factors for the disease. The association between poor dental health and acute myocardial infarction was investigated. 102 cases and 102 controls selected from the community at random. Dental health was graded by using two indexes, one of which was assessed blind. Based on these indexes dental health was significantly worse in patients with acute myocardial infarction than in controls.

4. COMPARISON OF BONE MINERAL DENSITY IN THE JAWS OF PATIENTS WITH AND WITHOUT CHRONIC PERIODONTITIS:

This study was done by M. Ozturk Tongue, B. A Guimus. F.Y Kirziogh that includes 48 systemically healthy subjects were included in the study and underwent a periodontal examination to determine their status. 24 subjects were periodontally healthy and the other 24 had moderate or severe chronic periodontitis. The mandibular bone mineral density of the subjects with periodontitis was significantly lower than that of the periodontally healthy subjects. This study concludes that bone mineral density in the jaw may be associated with chronic periodontitis.

5. COLONIZATION OF DENTAL PLAQUE: A SOURCE OF NOSOCOMIAL INFECTIONS IN INTENSIVE CARE UNIT PATIENTS

- A prospective study was conducted in a medical ICU of a university – affiliated hospital.
- 57 patients were included in the study. 29 patients were examined on day 0, 15 patients on day 5, 13 patients on day 10.
- Dental plaque score was calculated. 21 patients developed a nosocomial infection in the ICU.
- Dental plaque colonization on days 0 and 5 was significantly associated with the occurrence of nosocomial pneumonia and bacteremia.

- In six cases of nosocomial infection pathogen isolated from dental plaque was the first source of nosocomial infection.

- The amount of dental plaque increased during the ICU stay. Colonization of dental plaque was either present on admission or acquired in 40% of patients . A positive dental plaque culture

GENERAL OBJECTIVE :

- To assess the knowledge level among employees of Aakash Healthcare about the interrelationship between Oral Foci and Systemic diseases.

SPECIFIC OBJECTIVES:

- To examine the level of awareness on association between systemic diseases and common oral infections.
- To explore a relation between systemic diseases and oral infections.

METHODOLGY

STUDY AREA :

The study was conducted in Aakash Healthcare , Dwarka . Employees of Aakash Healthcare were taken into consideration.

STUDY POPULATION :

The study involved employees of age between age 25 and 60 years. Both male and female employees will take part in the study.

STUDY DESIGN :

Study is based on observational study design.

SAMPLE SIZE :

66 participants were involved in the study.

SAMPLING METHOD:

Convenience sampling method (Non Probability) was used in the study.

DATA COLLECTION TIME PERIOD:

– 11 April 2017 – 30 April 2017

INCLUSION CRITERIA:

- In this study, people included are above 25 years.
- Both male and female employees are included.
- Focus was to collect information from Non Medicos.

DATA COLLECTION TOOL:

- A self-administered closed ended questionnaire was used.
- The questions were in English and Hindi.
- The respondent gave a verbal consent.
- Then the respondents were given a questionnaire which he/she filled anonymously.
- Data Analysis Tool- SPSS 16.0

DATA ANALYSIS :

The presentation of data will be in form of tables and graphs.

DESCRIPTION:

SYSTEMIC DISEASES CAUSED BY ORAL MICROORGANISMS :

The relationship between periodontal inflammatory disease and systemic diseases such as cardiovascular disease , diabetes ,respiratory disease and adverse pregnancy outcomes are as follows:

1. CARDIOVASCULAR DISEASES :

- Cardiovascular disease (CVD) is characterized by the build -up of inflammatory plaques that may cause thrombosis and eventual myocardial infarction. Atherosclerosis is the term used for thickening and hardening of the arteries that is produced by this plaque build up.
- It represents a chronic inflammatory response that causes injury to the endothelium of elastic and muscular arterial tissue. The most common heart disease caused by oral microorganisms is infective endocarditis.
- Infective endocarditis in 50% of cases caused by viridans streptococci , particularly S.mutans & A.actinomycetemcomitans , especially in patients with valvular heart disease, poor dentition and periodontal disease.
- Some microorganisms have the ability to adhere to the heart surface more easily than others, because they produce an extracellular polysaccharide, dextran. Thus , the production of dextran

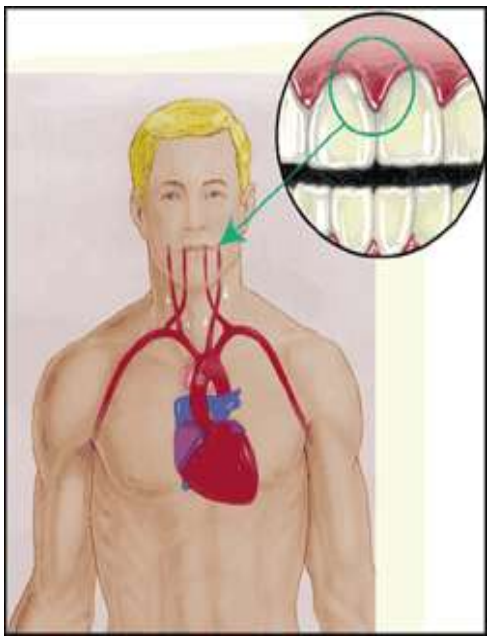
by S.sanguis and S.mutans is considered to be a virulence factor in the pathogenesis of endocarditis.

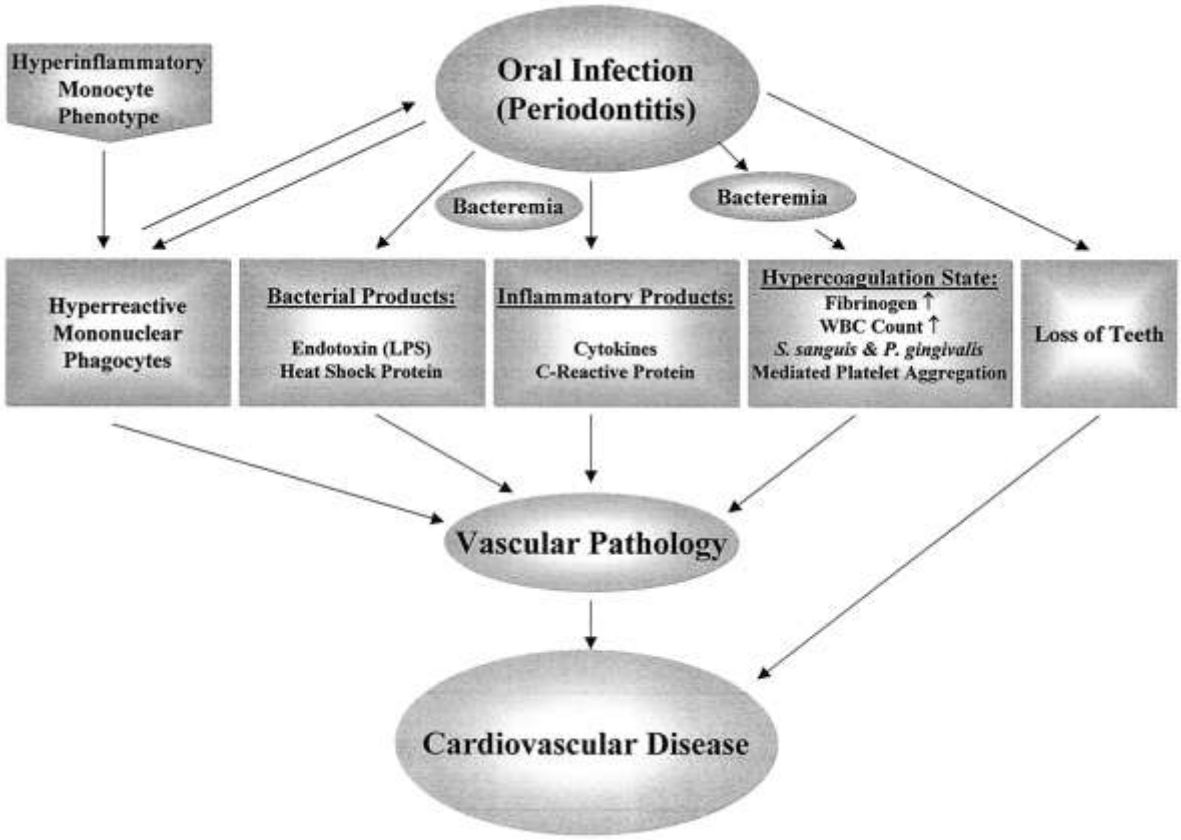
Most common symptoms of infective endocarditis:

- Fever
- Sweating
- Chills
- Fatigue
- Unproductive cough
- Weight loss
- Myalagia
- Arthralgia

MECHANISMS BY WHICH PERIODONTITIS MAY RELATE TO CARDIOVASCULAR DISEASES

- Bacteria causing periodontal infection enter bloodstream and invade the heart causing their toxic effects.The inflammatory mediators that are produced in response to periodontal infection travel through the bloodstream and reach the heart and blood vessels. Lipopolysacharides that are bacterial products travel through the bloodstream to reach the heart.
- Porphyromonas gingivalis is reported to colonize cells in the coronary artery and cause structural and immunological changes associated with early stages of heart disease.Bacteria that normally colonize the tooth can get displaced to reach the bloodstream during dental procedures ,flossing or even chewing food.
- Though these microbes are relatively harmless, they have an affinity for damaged endothelial cells and blood clots in the heart, where they multiply and trigger endocarditis. C- reactive protein is elevated in patients with periodontal diseases and hence this is considered a valuable tool to predict the occurrence of heart disease. C – reactive protein has gained significance as a risk factor for atherosclerosis.





Proposed mechanisms linking oral infection and periodontal disease to cardiovascular disease

2. RESPIRATORY INFECTIONS:

- A respiratory disease or infection involves the respiratory system affecting the lung and its anatomical parts. Pneumonia is leading causes among elderly; the majority of these patients are diagnosed as aspiration pneumonia.
- Pneumonia is an inflammation of the lungs parenchyma due to various etiological agents such as fungus, virus, parasites or bacterial infections.
- Oral cavity acts as foci of infection for the development of lung diseases such as aspiration pneumonia,COPD and lower respiratory tract infections.
- The poor or inadequate maintenance of oral health in nursing home residents, elder subjects, intensive care unit patients and hospitalized individuals requiring mechanical ventilation can predispose them to the development of aspiration pneumonia.
- The oral cavity is contiguous with trachea and may be a portal for respiratory pathogen colonization.
- Development of plaque often involves aggregation of many microorganisms or pathogens such as Staphylococcus aureus, Pseudomonas aeruginosa, P.gingivalis and A.actinomycetemcomitans.
- There are chances of aspiration of bacterial foci from the oral cavity into the lungs, increasing the risk of development of the aspiration pneumonia. These foci could be plaque or oral biofilm, residual root of the decayed teeth, residue in oral mucous epithelium and oral dryness as result of impaired oral function .
- Oral bacteria releases various enzymes which help them to adhere and colonize the mucosal surface. The cytokine released from the endothelial cell cause the recruitment of chronic inflammatory cells ,increasing the susceptibility of mucosa to the infections . Increased incidence of aspiration pneumonia in patients on ventilators having periodontal infections or poor periodontal health status , which increases mortality of elderly person.

3. DIABETES MELLITUS:

- Diabetes mellitus is a metabolic disorder affecting the metabolism of carbohydrates, lipids and proteins resulting in altered state of blood sugar. Type 1 DM is most common in children and adolescents, whereas type 2 DM affects adults. Patients with T2 DM usually have insulin resistance which alters the utilization of endogenously produced insulin at the target cells. During the early stage of the disease, insulin production is increased resulting in hyperinsulinemia. However, as the condition decreases leading to insulin deficiency. Whereas both type 1 DM and type 2DM have a genetic predisposition, the etiology of T2DM is also related to lifestyle factors such as high fat and sugar intake, physical inactivity and obesity.
- The role of diabetes plays in the initiation and progression of periodontal disease involves multiple factors. Poor metabolic control as well as extended duration of diabetes is a risk factor for periodontitis when extensive local irritants are present on teeth.

- Periodontitis may be a risk factor for worsening glycemic control among patients with diabetes may increase the risk of diabetic complications. Chronic periodontitis causes the imbalance between the host immune system and oral microbial flora resulting the increase in inflammatory response. To meet a high level of immune response body system requires high level of energy, resulting in reduction in the glucose level at cellular level.

- Recently, the role of certain oral microorganism present in chronic periodontitis has been suggested in worsening the status of DM. The chronic periodontitis, involving Gram – negative organisms specially P.gingivalis and P. intermedia have significantly higher levels of CRP and fibrinogen than those without periodontitis which may be associated with poor glycemic control. Dental procedures as well as daily activities such brushing or chewing can produce bacteremia and endotoxemia in patients suffering from periodontitis. These events increase levels of inflammatory mediators such as IL – 1, IL – 6 in serum leading to chronic inflammatory state. The inflammatory mediators play role in development of insulin resistance ,under the influence of environmental factors such as decreased physical activity, poor nutrition , obesity and infection.

4. <u>OSTEOPOROSIS</u>:

- Osteoporosis has been described as ‘thin bones’ or ‘brittle bones’. Periodontal pathogens releases endotoxins and proinflammatory cytokines, IL – 1 and IL -6 which results in uncoupling of normal bone homeostasis leading to increased osteoclastic activity and decreased bone density thereby causing osteoporosis.

- In the early stage, called osteopenia, there is a reduction in bone mass due to an imbalance between bone formation and bone resorption. Osteoporosis occurs as bone resorption becomes more prevalent and there is considerable demineralization.

- The common factor between osteoporosis and periodontal disease is the excessive osteoclastic activity and bone loss initiated through chronic inflammatory conditions. This shared chronic inflammatory response may predispose individuals with periodontitis to osteoporosis.

- Further, risk factors such as age, smoking and estrogen deficiency are the same for both, periodontal disease and osteoporosis. Estrogen modulates cytokines that regulate bone metabolism and the host inflammatory response. Lack of estrogen increases the number of osteoclasts causing an imbalance in bone metabolism and a reduction in bone density. Periodontitis also activates the inflammatory response and the osteoclasts. There is a significant correlation between periodontal disease and estrogen deficiency. These two risk factors, working together, can induce osteoporosis.

5. <u>PRETERM BIRTH:</u>

- Pregnancy can influence gingival health. Changes in hormone levels during pregnancy promote an inflammation termed pregnancy gingivitis. This type of gingivitis may occur

without changes in plaque levels. Oral contraceptives may also produce changes in gingival health. Some birth control pill users have a high gingival inflammation level but a low plaque level. Birth control pills may cause changes such as alteration of the microvasculature, gingival permeability, and increased synthesis of estrogen PGs. Oral infections also seem to increase the risk for or contribute to low birth weight in newborns. Low birth weight, defined as a birth weight of 2500 g, is a major public health problem in both developed and developing countries. Low birth weight in preterm infants remains a significant cause of perinatal morbidity and mortality. Compared to normal birth-weight infants, low-birth-weight infants are more likely to die during the neonatal period, and low-birth weight survivors face neurodevelopment disturbances, respiratory problems, and congenital anomalies.

- An increased rate of amniotic fluid infection, chorioamnion infection, and chorioamnionitis supports an association between preterm birth or low birth weight and infection during pregnancy. Histologically, the chorioamnion is often inflamed, even in the absence of any bacterial infection in the vagina (vaginosis) or cervical area. This suggests that distant sites of infection or sepsis may be targeting the placental membranes.
- Vaginosis, caused by gram-negative, anaerobic bacteria, is a significant risk factor for prematurity and is usually associated with the smallest, most premature neonatal deliveries. The biological mechanisms involve bacterially induced activation of cell-mediated immunity leading to cytokine production and the ensuing synthesis and release of PG, which appears to trigger preterm labor. Elevated levels of cytokines (IL-1, IL-6, and TNF-a) have been found in the amniotic fluid of patients in preterm labor with amniotic fluid infection. These cytokines are all potent inducers of both PG synthesis and labor. Intra-amnionic levels of PGE2 and TNF-a rise steadily throughout pregnancy until a critical threshold is reached to induce labor, cervical dilation, and delivery.

- As a remote gram-negative infection, periodontal disease may have the potential to affect pregnancy outcome. During pregnancy, the ratio of anaerobic gram-negative bacteria species to aerobic species increases in dental plaque in the second trimester. The gram-negative bacteria associated with progressive disease can produce a variety of bioactive molecules that can directly affect the host. One microbial component, LPS, can activate macrophages and other cells to synthesize and secrete a wide array of molecules, including the cytokines IL-1b, TNF-a, IL-6, and PGE2 and matrix metalloproteinases. If they escape into the general circulation and cross the placental barrier, they could augment the physiologic levels of PGE2 and TNF-a in the amniotic fluid and induce premature labour.
- The association between periodontal disease and low birth weight may reflect the patient's altered immune-inflammatory trait that places the patient at risk for both conditions. Thus, periodontitis may be a marker for preterm delivery susceptibility as well as a potential risk factor.

- The biological plausibility of the link between periodontal diseases and preterm birth can be summarized based on three potential pathways:-
- The first potential pathway involves the hematogenous dissemination of inflammatory products from a periodontal infection.
- The second pathway involves a fetomaternal immune response to oral pathogens.

- The third pathway proposed to explain the theoretical causal relationship between periodontal disease and preterm birth involves bacteremia from oral infections.

6. STROKE:

- Periodontitis is associated with elevated markers of inflammation that are themselves indicators of stroke risk. Bacterias, cytokines, LPS from periodontal pockets can enter the systemic circulation during activities such as chewing or tooth brushing. They promote atherosclerosis and affects blood coagulation, functions of platelets and prostaglandin synthesis thereby leading to stroke.

7. SKIN INFECTIONS:

- Oral microorganisms may cause skin infections by direct inoculation. Human bites leading to puncture wounds and fist fights with blows to the mouth causing abrasions are the most common ways for oral bacteria to infect the skin.
- The causative agents in these types of traumatic infections are generally anaerobic microorganisms, including P.intermedia, P.oralis, Peptostreptococcus micros.A.actinomycetemcomitans has been isolated from skin infections at heroin injection sites in drug addicts, because the patients test the needles for burrs by licking them with tongue.
- Chronic urticaria, which is a recurrent skin lesion that lasts for months, has been associated with infected third molars, periodontal abscesses and teeth with periapical abscesses.

RESULTS:

First question determines the medical history of the employees. Among 66 employees 3% had bone problems, 1.5% had blood problems, 10.6 % had skin infections. following this questions were framed to evaluate the awareness about association between oral infections & periodontal problems among employees.

AGE

	N	Minimum	Maximum	Mean
AGE	66	23	54	32.70
Valid N (list wise)	66			

Table 1

INFERENCE: ABOVE TABLE DEPICTS MEAN AGE OF RESPONDENTS IS 32

GENDER

	Frequency	Percent

Valid	F	3
	M	63
	Total	66

Table 2

INFERENCE: ABOVE TABLE SHOWS MAJORITY OF PARTICIPANTS WERE MALES(63)

HEART PROBLEMS

	Frequency
Missing	66

Table 3

INFERENCE: NONE OF THE PATICIPANTS HAS HEART PROBLEM

DIABETES

Table 4

	Frequency	Percent
Missing	66	100

INFERENCE: NONE OF THE PATICIPANTS HAD DIABETES

BONE PROBLEMS

		Frequency	Percent
Valid	1	2	3.0
Missing	System	64	97.0
Total		66	100.0

Table 5

INFERENCE : 3% OF PARTICIPANTS HAD BONE PROBLEMS

BLOOD PROBLEMS

		Frequency	Percent
Valid	1	1	1.5
Missing	System	65	98.5
Total		66	100.0

Table 6

INFERENCE : ABOVE TABLE REPRESENTS 1.5 % PARTICIPANTS HAD BLOOD PROBLEMS

SKIN INFECTIONS

		Frequency	Percent
Valid	1	7	10.6
Missing	System	59	89.4
Total		66	100.0

Table 7

INFERENCE: TABLE DEPICTS 10.6 % PARTICIPANTS HAD SKIN INFECTIONS

AWARENESS ABOUT INTERRELATIONSHIP BETWEEN SYSTEMIC DISEASES AND ORAL DISEASES

		Frequency	Percent
Valid	1	29	43.9
	2	21	31.8
	3	16	24.2
	Total	66	100.0

Table 8

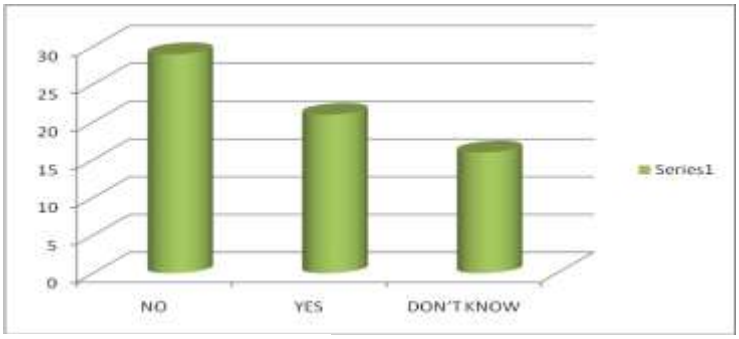


Illustration 1

INFERENCE:

MAXIMUM EMPLOYEES THOUGHT THERE IS NO INTERRELATIONSHIP BETWEEN SYSTEMIC DISEASES & ORAL INFECTIONS

AWARENESS ABOUT RELATIONSHIP BETWEEN BONE PROBLEM AND ORAL PROBLEM

		Frequency	Percent
Valid	1	32	48.5
	2	14	21.2
	3	20	30.3
	Total	66	100.0

Table 9

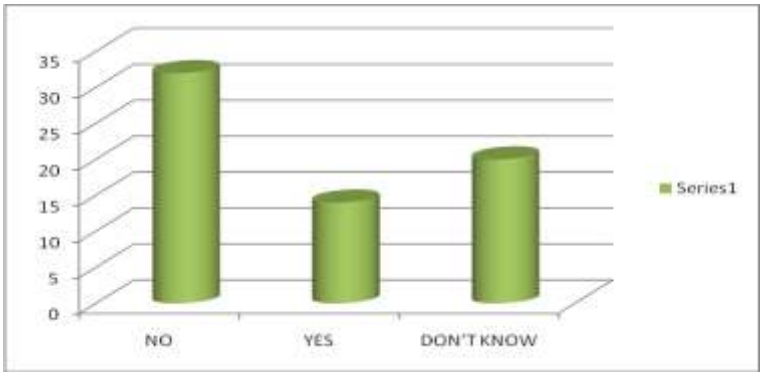


Illustration 2

INFERENCE: ACCORDING TO GRAPH 48% EMPLOYEES THOUGHT THAT THERE IS NO RELATIONSHIP BETWEEN BONE PROBLEM & ORAL PROBLEM

AWARENESS ABOUT ORAL CAVITY BACTERIA TRAVELS TO OTHER BODY PARTS

Table 10

		Frequency	Percent
Valid	1	23	34.8
	2	24	36.4
	3	19	28.8
	Total	66	100.0

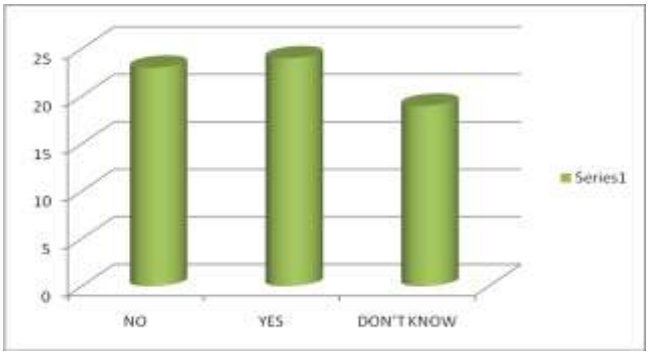


Illustration 3

INFERENCE: MOSTLY EMPLOYEES WERE AWARE THAT ORAL CAVITY TRAVELS TO OTHER BODY PARTS

AWARENESS ABOUT ASSOCIATION BETWEEN HEART PROBLEMS AND ORAL INFECTIONS

		Frequency	Percent
Valid	1	27	40.9
	2	11	16.7
	3	28	42.4

Total	66	100.0

Table 11

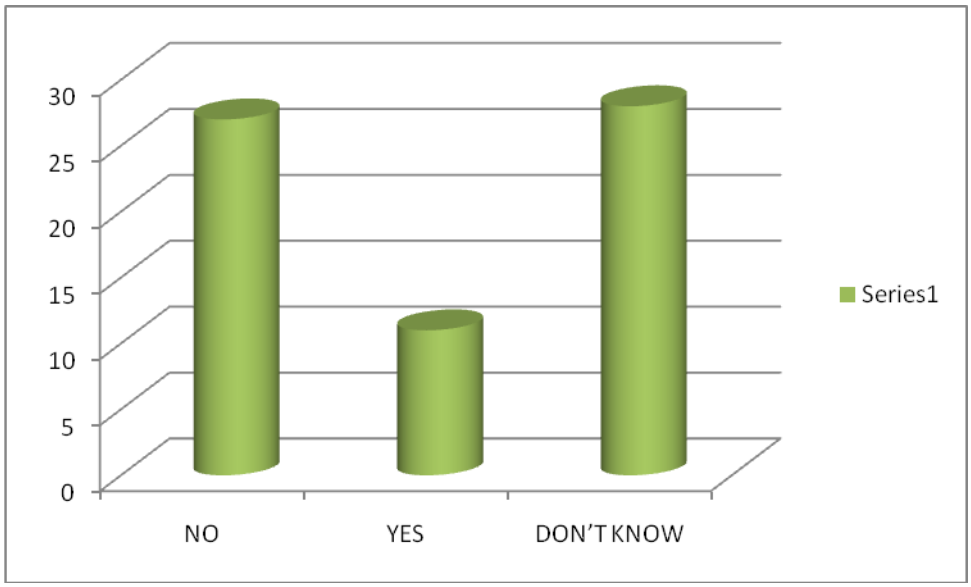


Illustration 4

INFERENCE: MAJORITY DON'T KNOW ABOUT ASSOCIATION BETWEEN HEART PROBLEMS AND GUM PROBLEMS

AWARENESS ABOUT RELATIONSHIP BETWEEN SKIN INFECTIONS AND ORAL INFECTIONS

		Frequency	Percent
Valid	1	22	33.3
	2	24	36.4
	3	20	30.3
	Total	66	100.0

Table 12

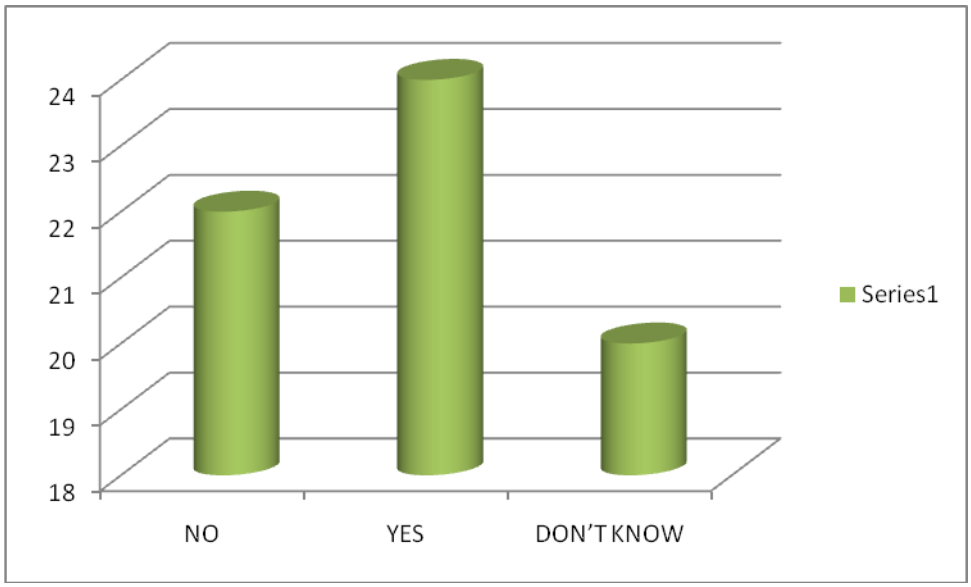


Illustration 5

INFERENCE: EMPLOYEES WERE AWARE ABOUT THE RELATION BETWEEN SKIN INFECTIONS AND ORAL INFECTIONS

AWARENESS ABOUT ASSOCIATION BETWEEN GUM PROBLEM AND PREGNANCY

		Frequency	Percent
Valid	1	16	24.2
	2	8	12.1
	3	42	63.6
	Total	66	100.0

Table 13

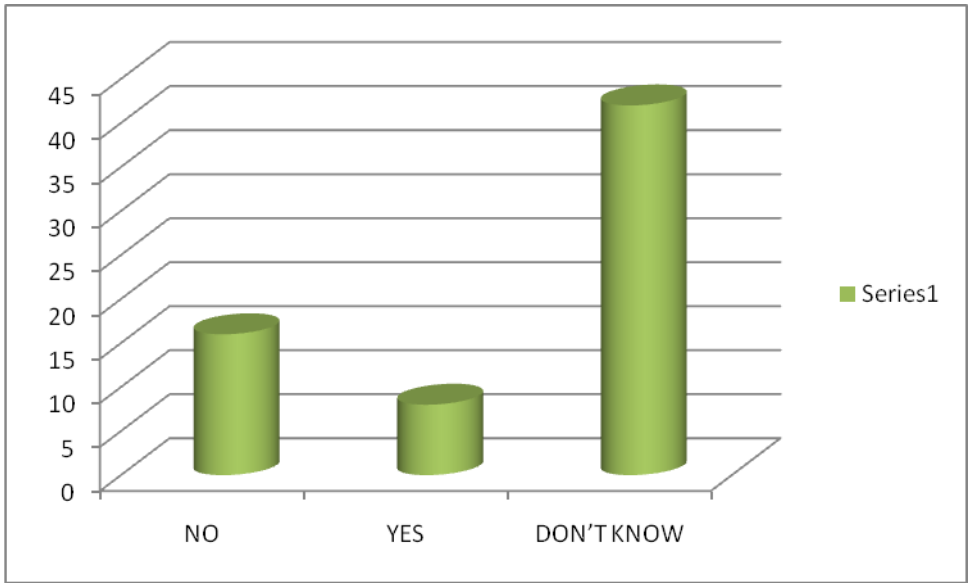


Illustration 6

INFERENCE: MORE THAN 60% OF EMPLOYEES WERE NOT AWARE ABOUT THE RELATIONSHIP BETWEEN GUM PROBLEMS AND PREGNANCY

AWARENESS ABOUT ASSOCIATION BETWEEN GUM PROBLEMS AND RESPIRATORY PROBLEMS

		Frequency	Percent
Valid	1	18	27.3
	2	16	24.2
	3	32	48.5
	Total	66	100.0

Table 14

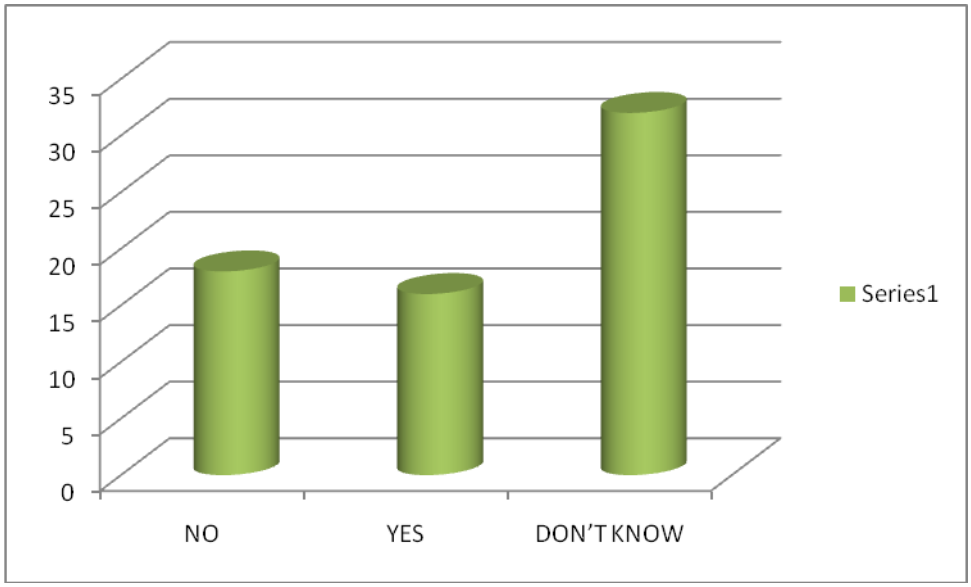


Illustration 7

INFERENCE: MAJORITY OF EMPLOYEES DON'T KNOW ASSOCIATION BETWEEN RESPIRATORY PROBLEMS AND ORAL INFECTIONS

AWARENESS ON ASSOCIATION BETWEEN GUM PROBLEMS AND DIABETES

		Frequency	Percent
Valid	1	17	25.8
	2	15	22.7
	3	34	51.5
	Total	66	100.0

Table 15

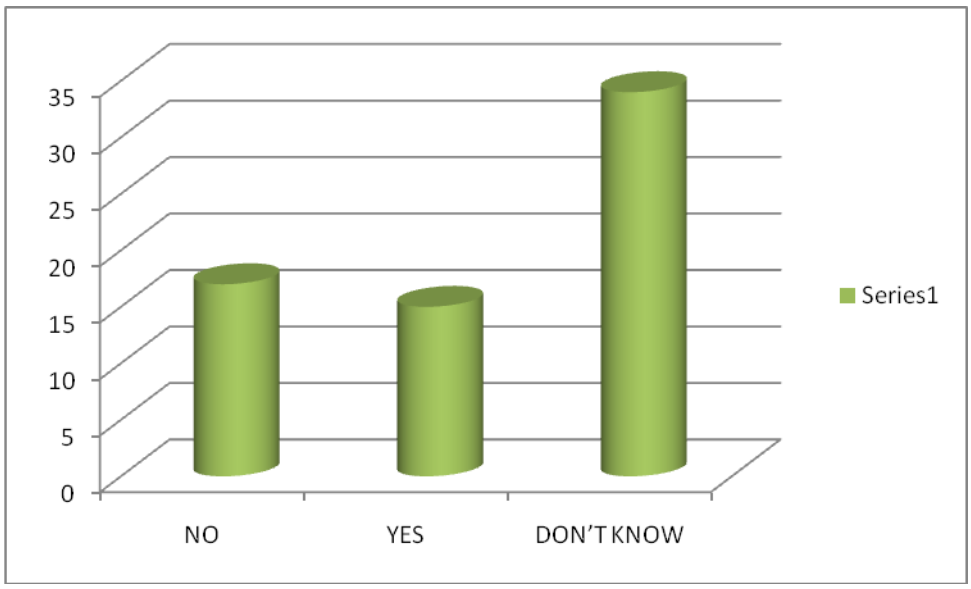


Illustration 8

INFERENCE: MORE THAN 50% OF EMPLOYEES DON'T KNOW ASSOCIATION BETWEEN GUM PROBLEM AND DIABETES

NUMBER OF TIMES PARTICIPANTS BRUSH THEIR TEETH PER DAY

		Frequency	Percent
Valid	ONCE	48	72.7
	TWICE	18	27.2

Table 16

INFERENCE: MAJORITY OF PARTICIPANTS BRUSH ONLY ONE TIME A DAY

TOOLS USED BY PARTICIPANTS FOR INTERDENTAL CLEANING:

		Frequency	Percent
Valid	DENTAL FLOSS	22	33.33
	TOOTH PICK	30	45.45
	OTHER	14	21.21
	Total	66	100.0

Table 17

INFERENCE: MAJORITY OF PARTICIPANTS USE TOOTH PICK.

LIMITATIONS:

- Sample size was small because time duration was less.
- Questions would have been included in the questionaire that determines the employees status & maintenance of oral hygiene.

CONCLUSION:

Oral infection especially periodontitis is a potential contributing factor to a variety of clinically important systemic diseases. Periodontal diseases are characterized by gingival inflammationand a loss of conective tissue and bone around the roots of teeth,which leads to tooth exfoliation. Periodontal pathogens and their products as well as inflammatory mediators produced in periodontal tissues can enter the bloodstream , thereby causing or contributing to the development of systemic diseases. This study presents a relationships between periodontitis & systemic diseasesincluding CVD respiratory infections preterm delivery of low – birth weight fetuses & DM. So, various studies have been conducted to know the association between periodontal diseases and systemic diseases so that it can raise society's awareness that good oral health is important not only to prevent oral disease but also to maintain good general health.

RECOMMENDATIONS:

- Majority of employees are not aware about interrelationship between oral infections and periodontal infections , so counselling activity should be planned in the organization.
- There should be regular dental checkups after 6 months as a part of managing general health so that fast and accurate oral health measures can be taken by employees to limit or reduce the speed & extension of oral complication.
- People with diabetes have a higher chance of getting gum disease ,they need to get oral prophlaxis done . If left untreated , gum diseases can lead to tooth loss and may also make diabetes harder to control.
- As majority of participants brush once a day , importance of brushing should be explained to participants.
- Majority of participants use tooth pick , it may damage teeth and gums.
- Regular dental checkups can increase the patient footfall in Dental department of our hospital.
- This step not only increase awareness about oral diseases and systemic diseases but can increase the OPD number in dental department.

ANNEXURE

QUESTIONAIRE:

Name: Age: Sex: OPD NO:

Q1: Do you have any of the following problem ?

Heart problem

Diabetes

Bone problem

Blood problem

Skin infections

Q2: Do you know oral infections lead to systemic diseases?

3. No
4. Yes
5. Don't know

Q3: Do you know that bone problem is related to oral problem?

3. No
4. Yes
5. Don't know

Q4: Do you know that bacteria of oral cavity travels to other body parts?

- No
- Yes
- Don't know

Q5: Do you know gum problems lead to heart problems?

a) No

b) Yes

c) Don't know

Q6: Do you know skin infections are related with oral infections?

a) No

b) Yes

c) Don't know

Q7: Is gum problem common during pregnancy?

a) No

b) Yes

c) Don't know

Q8: Will gum problem leads to respiratory problem?

a) No

b) Yes

c) Don't know

Q9: Do you think blood disorders cause gum problem ?

a) No

b) Yes

c) Don't know

Q10: Do you think gum problem worsen diabetes?

a) No

b) Yes

c) Don't know

Q11: How many times do you brush your teeth?

a) Once b) Twice

Q12: Tools used for interdental cleaning?

a) Dental floss b) Tooth pick C) Other

1. ?

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10. ?

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11. ?

12. ?

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