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RESEARCH ARTICLE

IS DIET A CONTRIBUTING FACTOR FOR RECESSION.

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Abstract

Background: The role of nutrition in periodontal health and its effect on progression of disease is less established. Dietary components play a major role in the pathogenesis of dental caries, but play a modifying role in the progression of periodontal disease. Hence, the aim of the present study was to assess the effect of dietary influence on gingival recession.

Materials and method: 330 patients visiting the outpatient Department of Periodontics (217 males and 113 females) were assessed for their dietary habits and oral hygiene practices which were recorded in the form of questionnaire. Periodontal examination included assessment of gingival recession (Miller PD Jr. classification) and Community periodontal index modified was used to record the probing pocket depth and clinical attachment loss. The questionnaire was divided into nine groups. Group 1 (type of diet), Group 2 (type of fruit), Group 3 (type of sauces), Group 4 (snack foods), Group 5 (sugar and its products), Group 6 (Special foods and aerated drinks), Group 7 (milk and its products), Group 8 (environmental factors) and Group 9 (brushing habits). These groups were further divided into sub categories.

Results: There was statistical significance to recession with progressing age ($p < 0.001$). Group 1, 2 and 3 had no statistical significance to recession. Statistical significance was found in the sub categories of group 4 (potato snack), 5 (chocolate consumers), 6 (soft drinks and instant drinks), 7 (milk and frozen milk), 8 (tobacco consumption-smoking and smokeless) and 9 (frequency of brushing).

Conclusion: Diet modifications have the potential to influence periodontal health and disease management by improving clinical outcomes as concluded from the present study.

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Introduction:-

The role of nutrition in periodontal health is less established. A diet can produce both topical and systemic effects on the body and its tissues. Periodontal diseases are bacterial or inflammatory disorders that lead to destruction of the

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supporting tissues of the teeth. Although dietary components play a major role in the pathogenesis of dental caries, diet plays a modifying role in the progression of periodontal disease.¹

Bacterial plaque is the primary initiating factor for periodontitis.^{2,3} Several other factors however were suggested to increase a person's susceptibility to developing periodontitis such as smoking and diabetes.^{4,5} Poor diet and inadequate nutrition were also suggested as possible risk factors for periodontitis.⁶

Gingival recession or marginal tissue recession is defined as the location of marginal tissue apical to CEJ with exposure of the root surface.⁷ Studies have shown a range in prevalence of gingival recession. Several dietary habits can itself induce gingival recession leading to attachment loss.

Diet is also known to be inflammatory diet (anti-inflammatory or pro-inflammatory). Poor diet is not likely to be sufficient or necessary in the pathogenesis of periodontal disease. However, diet may influence periodontal health by modifying the susceptibility of host immunity to infection rather than it being a primary etiological factor.⁶

Hence, the aim of the present study was to assess the effect of dietary influence on gingival recession.

Materials and methods:-

A total of 330 patients visiting the outpatient Department of Periodontics (217 males and 113 females) were examined and detailed information regarding the dietary habits and oral hygiene practices were recorded in the form of a questionnaire. Periodontal examination included gingival recession (Miller PD Jr. classification) and Community periodontal index modified was used to record the probing pocket depth and clinical attachment loss (Figure 1).

The data was collected and statistically analyzed using SPSS 17.0. Chi-square test was done for comparison of the parameters to recession. A p value of <0.005 was considered to be statistically significant.

Results:-

Recession was assessed by dividing the various parameters into groups. Demographic data of age and gender was considered. The study was divided into nine groups and were as follows: Group 1 was type of diet (vegetarian or non-vegetarian), Group 2-type of fruit (citrus, tropical and dried), Group 3-type of sauces (gravies, pickles), Group 4-snack foods (potato and corn), Group 5-sugar and its products (honey, jams, chocolates and health bars and confectionaries), Group 6-Special foods (special dietary foods, instant food and processed food) and aerated drinks (soft drinks), Group 7-milk and its products (milk, yogurt, cream, cheese, frozen milk, flavored milk, tea and coffee), Group 8-environmental factors (smoking, tobacco chewing and pan chewing) and Group 9-brushing habits (type of bristle, stroke of brushing, dentifrice used, replacement of tooth brush, frequency of brushing and use of interdental aids). Periodontal status including recession was assessed with each of these groups.

When demographic data was assessed for age and gender attachment loss and recession was positively correlated in relation to age and was not significant with gender. No statistical significance was found in group 1 for recession (Graph 1, Table 1). On an average, among the various fruits consumed (Group 2) and type of sauces consumed (Group 3), there was no significant correlation for recession amongst the study population (Graph 2, Table 2).

When snacks containing either potato or corn were compared to recession, only the snacks containing potatoes showed statistical significance ($p < 0.001$) (Graph 2, Table 2).

Among group 5 of the study population, only the category who consumed chocolates showed statistical significance for recession (mainly in younger population) (Graph 2,3, Table 2,3).

There was moderate statistical significance in the category of group 6 and group 7 for soft drinks and instant drinks in group 6 and milk and frozen milk in group 7. However, other categories in the same groups like instant foods, special dietary foods, processed foods of group 6 and milk products (yogurt, cream, cheese and flavored milk) of group 7 did not show any statistical significance (Graph 3,4,5, Table 3,4,5).

Group 8 which included environmental factors like smoking, tobacco chewing and pan chewing had statistical significance to recession (Graph 6, Table 6).

When all the brushing habits (Group 9) were considered only frequency of brushing had statistical significance for recession (Graph 7, Table 7).

Discussion:-

Dental conditions are usually overlooked by patients until pain or major oral symptoms are a major concern, whereas gingival recession is a visible dental change that is noted by patients and causes them to seek the advice of a dentist.

The significance of any gingival recession may vary considerably depending on the etiology, extent and associated symptoms in each case. This study aimed to investigate the relationship between diet and gingival recession. The dietary intake was classified into six groups and the remaining two groups consisted of environmental factors and oral hygiene measures.

Poor diet is not likely to be sufficient or necessary in the pathogenesis of periodontal disease. However, diet may influence periodontal health by modifying the susceptibility of individuals to infection rather than being the primary etiological factor.⁶ Adequate diet and nutrition have been suggested to improve the resistance of individuals to infection and may also influence the virulence of periodontal pathogens.⁸ The type and amount of food consumed may influence plaque formation by providing the plaque bacteria with necessary nutrients or by altering their surrounding environment.⁹

Though a lot of studies have been done to evaluate the relationship of diet and dental caries, this study may be the first to examine relationship of diet to recession. Although dietary components play a major role in pathogenesis of dental caries, diet plays primarily a modifying role in progression of periodontal disease.¹

Literature suggests that there is a relationship between the age of the experimental animal and extent of apical migration which supports the 1920s hypothesis that there is continuous passive eruption of teeth causing physiological recession.^{10,11} This is consistent with the findings of the present study which suggests that as age increases the prevalence of recession increases. There was no relation found between both the genders to recession.

Type of diet, either vegetarian or mixed, did not show any statistical significance to recession. But the results of an animal study on cats and dogs showed that feeding a dry food diet has a positive influence on oral health, decreasing the occurrence of dental deposits and periodontal disease.¹² Another study stated that softer diet may promote plaque accumulation and subsequently contribute to the development of periodontal disease.^{13,14}

Type of fruit (citrus, tropical or dried) did not have any correlation to recession. Certain studies revealed that some fruits tend to cause only moderate decrease in plaque pH. Apples, however, besides containing sometimes high concentrations of free acids, by virtue of their sugars content, can also give rise to formation of acid in plaque.¹⁵ Thus proving the popular saying 'an apple a day keeps the doctor away' may also apply to '...keeping the dentist away'. Types of savories did not have any correlation to recession.

Snack foods containing potato showed correlation to recession thus stating starch containing food may modify the plaque bacteria thus causing recession.

Sugar product consumed in the form of honey, jam and chocolates had an effect on recession. This was also proved by a study which concluded that cereals, nuts and seeds, sugar and sweeteners and confectionery were related positively to dental plaque formation.^{16,17}

Soft drinks and instant drinks had some significance for recession. This can be attributed to the fact that aerated drinks can cause tooth erosion thus creating plaque retentive areas.

Milk and frozen milk caused recession. This is not in par with the findings of the study which stated that foods that are rich in calcium are associated with lower prevalence of periodontitis in United States population.² Dairy products are richer sources of several nutrients needed for bone development and maintenance such as calcium,

phosphorus, magnesium, potassium, zinc, protein, vitamin D etc. The ratio of calcium to phosphorus in dairy product is optimal for building bone tissues. Calcium was hypothesized to have indirect effect on periodontal condition through regulation of skeletal and alveolar bone density.¹⁸

Environmental factors like nicotine in any form (smokeless or smoking) had significant correlation to recession. This is a well proven fact that patient who smoke have more gingival recession due to the hypothesis that smoking causes systemic alterations in the immune response or local changes such as a reduction in gingival blood flow thus causing recession.¹⁹

A study stated that increased frequency of brushing is a factor for recession along with the type of brush and simple brushing techniques;¹⁰ although this study could only prove that the frequency of brushing had a direct correlation to recession.

Thus nutrients act as a double edge sword. It is reasonable to consume a nutritionally adequate diet to help maintain host resistance and to maintain the integrity of the periodontal tissues. A good diet contributes to both good general health and good oral health. Consumption of diet that focuses on reducing our intake of refined carbohydrates and includes eating more whole grains, fruits, vegetables and dietary sources of calcium is required.¹

A diet that consists of right amount of essential nutrients such as carbohydrates, proteins, fats, vitamins, minerals, roughage and water required by the body is called a balanced diet. The recommendations of the 2011 European workshop on Periodontology suggest that the dental team should consider including advice to all patients on increasing levels of fish oils, fiber, fruit and vegetables and to reduce levels of refined sugars as part of a periodontal prevention/ treatment regime and a general health benefit message.^{20,21}

Conclusion:-

Diet modifications have the potential to influence periodontal disease management by improving clinical outcomes. There is, however, insufficient evidence to justify as to how diet influences the progression of recession. Future research should focus on an evaluation of which foods and nutrients may help to prevent the onset and the progression of oral diseases.

Limitations:-

1. A semi-quantitative food frequency questionnaire was used to determine quantitative food intake.
2. Food intake records may not provide a complete picture of what is being eaten on a routine basis.
3. Precise weighing methods are not possible to measure the amount of nutrients consumed.
4. Could not confirm a clear cause-effect relationship between nutrition and periodontal disease because of a lack of longitudinal studies.
5. To explore the actual relationship, further prospective studies and clinical trials will be necessary.

Graph 1:-Correlation between recession and demographic data and Group 1.

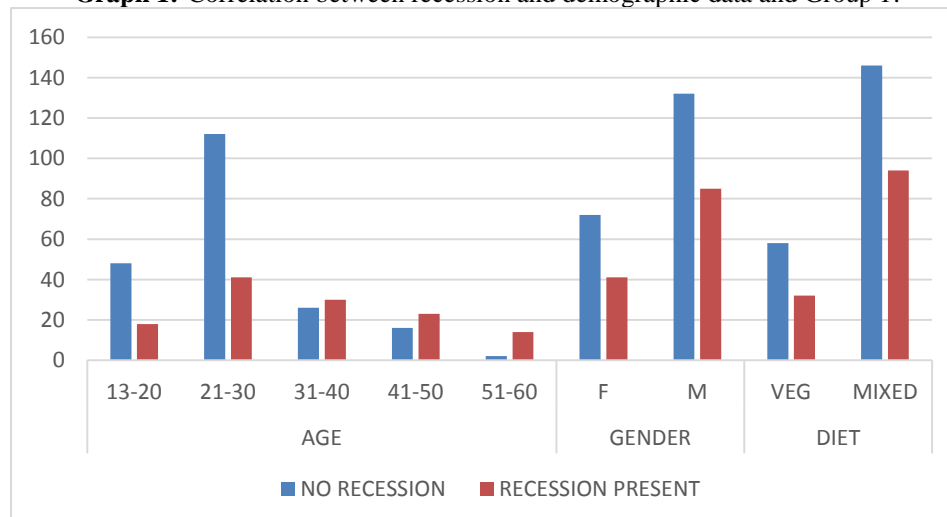
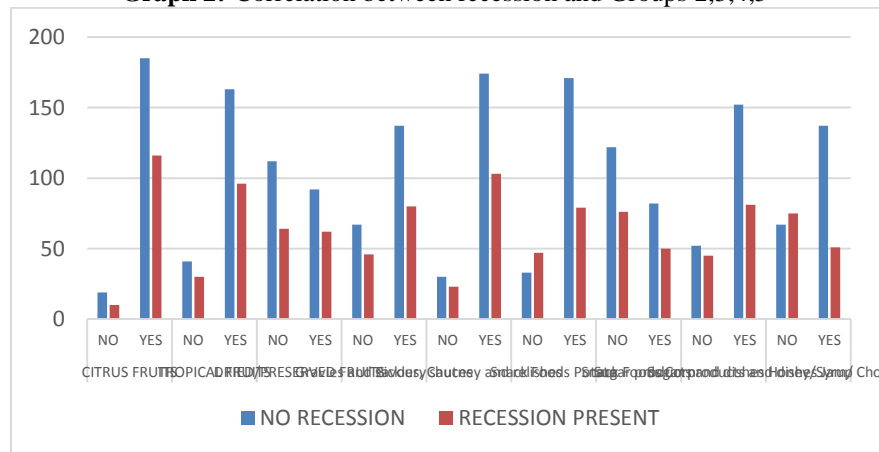


Table 1:-Correlation between recession and demographic data and Group 1

Groups	Age	p value
Demographic data	13-20	<0.001
	21-30	
	31-40	
	41-50	
	51-60	
Group 1	Gender	0.608
	Male	
	Female	
Group 1	Diet	0.548
	Veg	
	Mixed	

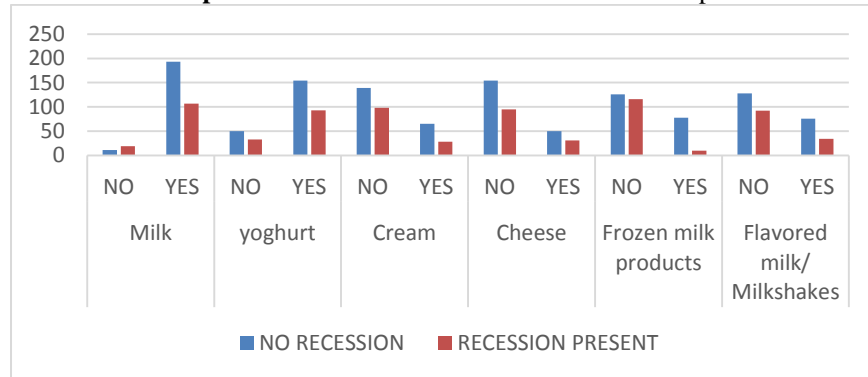
Graph 2:-Correlation between recession and Groups 2,3,4,5**Table 2:-**Correlation between recession and Groups 2,3,4,5

Groups	Type of food	P value
Group 2	Citrus fruits	0.668
	Tropical fruits	0.425
	Dried/Preserved fruits	0.467
Group 3	Gravies and savoury sauces	0.495
	Pickles, Chutney and relishes	0.394
Group 4	Snack food potato	<0.001
	Snack food corn	0.926
Group 5	Sugar product and dishes honey/ syrup	0.048
	Sugar product and dishes jam/ Chocolate	<0.001

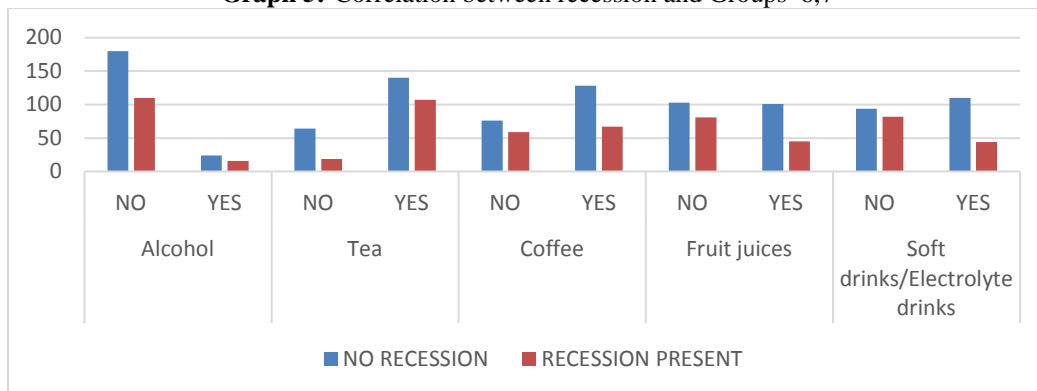
Graph 3:-Correlation between recession and Groups 5,6

Table 3:-Correlation between recession and Groups 5,6

Groups	Type of food	P value
Group 5	Confectionary health bar and chocolate	0.559
	Cereal/ fruit/ nuts and seeds	0.987
	Confectionary health bars	0.18
Group 6	Special dietary foods	0.238
	Instant foods	0.054
	Instant drinks	0.019
	Processed food	0.068

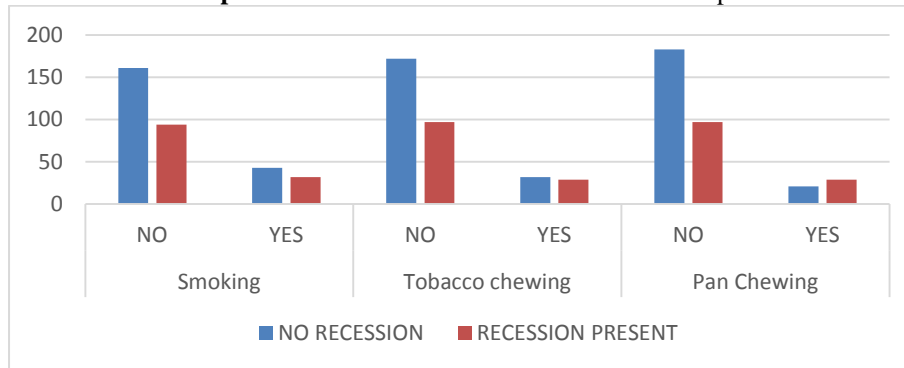
Graph 4:-Correlation between recession and Group 7**Table 4:-**Correlation between recession and Group 7

Groups	Type of food	P value
Group 7	Milk	0.003
	Yogurt	0.732
	Cream	0.059
	Cheese	0.985
	Frozen milk products	<0.001
	Flavoured milk/ milkshake	0.054

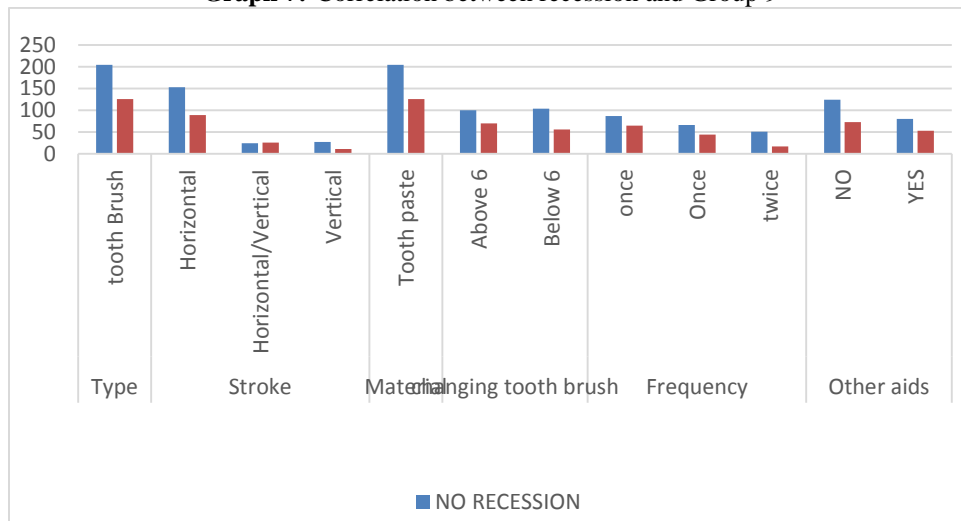
Graph 5:-Correlation between recession and Groups 6,7**Table 5:-**Correlation between recession and Groups 6,7

Groups	Type of food	P value
Group 7	Tea	0.001
	Coffee	0.086
	Fruit juice	0.014

Group 6	Soft drinks and electrolytes	0.001
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Graph 6:-Correlation between recession and Group 8**Table 6:-Correlation between recession and Group 8**

Groups	Type of food	P value
Group 8	Smoking	0.363
	Tobacco chewing	0.096
	Pan chewing	0.002
	Alcohol	0.801

Graph 7:-Correlation between recession and Group 9**Table 7:-Correlation between recession and Group 9**

Groups	Oral hygiene practices	P value
Group 9	Type	-
	Stroke	0.06
	Material	-
	Changing toothbrush frequency	0.248
	Frequency	0.039
	Other interdental aids	0.608

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