ORAL HEALTH AND DENTAL CARIES

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Abstract

Introduction

Dental disease is widespread among various groups, as tooth decay ranks second after the common cold, as it is widespread and as soon as the child reaches the age of five (Colombo,et2019). Among the most important causes of tooth decay are carbohydrates, bacteria, susceptibility to caries, and the time factor, it divides tooth decay into the type of chronic caries and acute decay. The type of bacteria associated with decay is Streptococcus mutans؛ (Bender GR, Sutton SV,1986), Lactobacilli Actinomyces (Kligler IJ1926)

Methods

A group of children and adolescents of both males and females , consisting of ١٣٦ Children , with age ranging from 6-12 years were examined in the clinics of the college of dentistry university of Babylon ,and the tools use for this examination were using a disposable basic oral mirror and WHO periodontal probe and coEon roll and tweezers and

gloves and mask , the average examination 6me per child was approximately 5 minutes (WHO 2001) ,Examination of caries prevalence and history was measured using DMFT (mean of decayed ,missing , filled , permanent teeth) , and oral hygiene index measured using Plaque index Pll of Silness and Loe (1964) and Gingival index GI Loe and Silness (1963)

conclusion

In explaining the consistent trend of caries rates being higher in male all contributing factors must be considered Evidence has been provided to demonstrate that caries risk factors for male

dietary habits establishment of a cariogenic environment For instance,Negligence of poor oral hygiene practices Lack of dental services, for example, fluoride delivery Parents' neglect of their children's dental health

Result

The prevalence of dental caries in female and male study participants were 7 for male and6.4 for female

There was a significant association between oral hygiene/ age/gender and dental caries

We have 136 child in this research we found 101 cases in children aged 6-9 years and 35 cases from 10-14 years and according to gender 66 male and 70 female

According to oral hygiene, pl is 0.7 for males and 0.64 for females and gl is 0.46 for males

and 0.29 for females. This shows us that males are more affected by caries than females in this research.

INTRODUCTION :

Dental caries is one of the most frequent oral and dental disorders across all age groups; by the time a child reaches the age of five, about(Colombo,et2019) teeth have been impacted by caries, and by

puberty, more than(Hussein,et2020) teeth have been affected by caries (Dias et al ., 2019) Tooth decay is a deterioration of the tooth's structure, if left untreated, can lead to painful and destructive stages. Unless the initiative is rapidly established to increase caries in the early stages, the tooth is weakened(Jabuk et al ., 2015).

An early sign of the onset of caries; The appearance of white (chalky) spots on the surface of the teeth;

Referring to a region of mineral dissolution caused by the formation of acids in this area, and as the dissolution of minerals continues, these white spots turn brown. In the absence of a medical examination, Brown spots turn into decay, and holes occur in the teeth, and if these

spots remain in their bright brown color; This means that the metal dissolution process stops, and this color is only a stain, but if it turns dark brown; This indicates

that caries is in an active state(Boehlke et al ., 2020) .

•Causes of Tooth Decay

Many people believe that caries develops solely as a

result of neglecting teeth and failing to keep them clean, yet caries develops when the following variables are present :

1-Carbohydrates: Foods that contain high carbohydrates, such as sugars, starches, ice cream, sweets, fruits, and juice, are among essential substances that help the occurrence of decay if they remain on the surface of the tooth for a long time(Inquimbert et al ., 2019).

2- Bacteria: Sugars alone cannot cause decay without the presence of bacteria, and certain types of bacteria help in the occurrence of decay, including spherical bacteria and rod-shaped bacteria(Hussein,2020).

3- The susceptibility of teeth to decay: This is due to poor nutrition in periods of tooth formation, as the proportion of minerals in the teeth such as calcium and phosphates is reduced which leads to brittle teeth .

4- The time: if the teeth are not cleaned regularly and adequately; The (bacterial plaque) forming on the teeth becomes challenging to control and effectively remove, thus tooth decay will begin(Hussein et al ., 2019).

Steps of Tooth Decay :

1- The remnants of foods containing high carbohydrates left on the teeth. such as sweets, bread, fruits, and juice .

2- Then, the bacteria that are already in the mouth digest these residues, especially sugar and starch, and convert them into acids .

3- These acids and bacteria combine with food waste. It forms a sticky substance that is the germinal plaque (plaque) and this, in turn, adheres to the teeth and is visible on the back molars, but it appears on all teeth, above the gums, and at the edges of the fillings .

4- The acids in the plaque dissolve the tooth's enamel surface - which is the outer layer of the tooth that consists of a substance called hydroxyapatite – creating cavities that are initially small and painless, and are an ideal place for germs to multiply, and grow inside the

tooth to reach the dentin (the middle layer of A tooth crown) causing pain when cold and hot, then to the pulp of the tooth (blood vessels and nerves), where it becomes painful, especially at night(Durand et al ., 2019; Al-Shami et al ., 2019) .

Types of Tooth Decay:

There are two types of caries, considering the time and speed of its occurrence:

1- Chronic caries: it occurs over a long time and in several stages; Starting with enamel, then dentain, and finally, the pulp .

2- Acute caries: it occurs very quickly; It reaches the pulp of the tooth without the tooth's tissues being able to protect it, and this type of decay occurs frequently in children(Hussian et al ., 2019).

Dental Caries Complications

The substance in decay does not depend on the unpleasant look of the tooth, nor does it stop at the boundaries of the tooth or the mouth, but rather develops into a number of health difficulties, some of which damage the teeth themselves, and some of which extend beyond that. Among the complications are:

1- Extraction of the teeth .

2- Dental erosion .

3- Bad breath .

4 -Abscess beneath the root of the teeth: This occurs when the advancement of caries continues to destroy the pulp, resulting in an abscess under the root that causes significant infections. Such as lymph node inflammation, osteitis, and sinusitis(Kazemtabrizi et al ., 2020) .

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5- Furthermore, rotting teeth can serve as an entrance point for serious infections that damage other regions of the body, such as the heart in those with birth abnormalities or rheumatic heart disease.

6- Gingivitis is caused by tooth decay, which manifests as ulcers that can migrate to the inner parts of the gums, causing bleeding, redness, and swelling. (Jafarzade et al ., 2021) .

The type of bacteria that cause tooth decay :

1-**Streptococcus mutans**; is a Gram-positive bacterium commonly found in human dental biofilms. It is a dominant species with higher biomass in dental biofilms . due to its acid tolerance and thus the capability to live in low pH environment of oral cavities while it is also highly acidogenic and aciduric. S. mutans can rapidly colonize tooth surface and establish cariogenic biofilms with extracellular polysaccharides (EPS). This acidifies the local microenvironment and promotes the growth of an acidogenic microbiota, facilitating the development of dental caries(Bender GR, Sutton SV,1986)

2-**Lactobacilli**: is a genus of gram-positive have been considered as major contributors to human dental caries for over a century. Recent in vitro model studies have shown that when compared to Streptococcus mutans, a keystone pathogen of human dental caries, the ability of lactobacilli to form biofilms is poor, although differences exist between the different major species. Further studies using molecular and bioinformatics approaches provide evidence that multiple mechanisms, including adhesin-receptor mediated physical contact with S. mutans facilitate the adherence and establishment of lactobacilli on the tooth

surface. There is also evidence that under conditions like continuous sugar consumption, weak acids and other antimicrobials such as bacteriocins from lactobacilli can become detrimental to the microbial community, especially those in the proximity. Details on the underlying mechanisms of how different Lactobacillus sp. establish and persist in the highly complex microbiota on the tooth surface await further investigation.

Major Lactobacillus species in dental caries From over a century of extensive investigations, the connection of lactobacilli to human dental caries in children and adults has been well established(. Kligler IJ1926)

3-**Actinomyces** : are gram-positive and facultatively anaerobic viscosus has been associated with the development of root surface caries. The lesions are different from enamel caries in that the calcified tissues are softened without obvious cavitation. They tend to form on the buccal and lingual surfaces Few detailed in vivo microbiological studies of root surface caries have been reported, the majority being cross-sectional rather than the more appropriate longitudinal type.(T. Wallace MacFarlane BDS)

4- **Enterobacteriaceae**: is a large family of Gram-negative bacteri communities in gingival crevice grow as biofilms (plaque) on teeth and gum surfaces in periodontal pockets and are implicated in chronic periodontitis due to periodontal therapy failure.(Sehdev, B.,2019)

Material and Methods

Study group

The data used for this study were from cross-sectional studies that included primary school children aged 6 to 12 years and others who did

not have An opportunity to receive education in the clinics of the College of Dentistry in University of Babylon.

Communities

As the clinics of the collage of dentistry are location within center of babel governorate ,which cover an area of 5,307km2 and it population is estimated at proximately 2,065,042 people based on the population census of Iraq ministry of planning for 2018 education . (Iraqi Ministry of Planning)

Sample selection

The sample were selected from the above-mentioned age group (6-12) and included school student and other who did not have the opportunity to receive on education the study was conducted on both male and female

Examination at the clinics

The examination was performed by seven dental students who had previously been trained in the standardized diagnostic criteria and basic methods defined by the World Health Organization (WHO 2001), with the assistance of a specialist dentist. Before the main study, a group of 20 patients aged 6–10 years (not part of the study sample) were examined for inter-examiner calibration, with an excellent level of agreement (Cohen's kappa coefficient = 0.94). A total of 136 individuals were

examined in dental clinics at the University of Babylon. The clinics had a high level of attendance, so there was no need for more active recruitment.(WHO (World Health Organization)1997)

Sample size was calculated before data collection using the expected sample size formula. Our target population was children and adolescents in babel Governorate, and the calculated sample was 136. Therefore, we targeted a sample of about 136 people to take into account that our study included multiple comparisons of proportions and ranked values.

Dental examinations were performed on patients using a disposable basic oral mirror and a WHO periodontal probe and cotton roll and tweezers and gloves and mask . The average examination time per child was approximately 5 minutes. An oral health assessment model was developed, based on the model proposed by the World Health Organization .(WHO 2001) For each patient demographic (age and gender);

Dental brushing frequency as well as clinical variables were recorded as follows:

1-Dental caries

Examination of caries prevalence and history was measured using DMFT (mean of decayed, missing and filled permanent teeth).

2-plaque Index

Pll of Silness and Loe (1964):

To determine the plaque index of the patients, their dental plaque thickness was evaluated by probing the mesial, distal, buccal , and palatal surfaces of all teeth using a WHO periodontal probe. The plaque index of an individual was determined by summing the values obtained for each tooth and calculating the averages.

3-Gingival Index (GI) of Löe and Silness (1963) :

To determine the gingival index of the patients, gingival bleeding caused by running a WHO periodontal probe inside the pocket on the mesial, distal, buccal, and palatal surfaces of all teeth was evaluated. The gingival index of an individual was obtained by summing the values determined for each tooth and calculating the averages

Result

age	number	percentage
Age 6-9	101	74%
Age 10-14	35	26%
Total 6-14	136	100%

Table 1 distribution of children by age

The prevalence of dental caries and oral hygiene status of children Participants aged 6-9 years were most prevalent accounting for 74%

While participants aged 10-14 years for 26%

This explains to us the age group 6-9 is more prone to dental caries because Frequent eating and drinking of sugary or starchy foods and drinks cause this with Less attention to oral hygiene

While the Children aged 10-14 are more concerned with their teeth and oral hygiene. They eat sweets during mealtime, which makes them less susceptible to tooth decay.

gender	number	percentage
male	66	49%
female	70	51%
total	136	100%

Table 2 distribution of children by gender

There were a slightly higher percentage of female participants 70 (51%) compared to males 66(49%)

This because many factor such us saliva the flow rates of saliva and compositional analysis have been shown to be generally less protective in women than in men

Time In the pattern of tooth eruption, females tend to acquire their teeth at an earlier age than males.

and many factor such us genetic / substrate /diet

Psychosocial and economic factor

variable	mean	SD
Dental caries surface(Ds)	6.60	7.21
filling surface	1.1	2.38
missing surface	0.44	1.88
DMFs	8.08	8.49
DMFt	4.41	3.02
PL	0.68	0.52
GI	0.37	0.48

Table 3 variables measure of children

Unlike the values of SD The samples that were taken showed variables If we go back to more research around the world There were variable measure between children from one region to another between one age to another between female and male it's varies according to circumstances in which the child found Depending on the interest of the parents As well as environmental conditions and geographical area

Dental caries of male children

	mean	s.d
Dental caries surface of male	7	8.09
filling surface of male	1.5	3
missing surface of male	0.55	2.33
DMFs of male	8.8	10.27
DMFt of male	4.8	3.31

Dental caries of female children

	mean	s.d
Dental caries surface of female	6.4	6.2
filling surface of female	0.61	1.4
missing surface of female	0.32	1.3
DMFs of female	7.3	6.3
DMFt of female	4.04	2.76

	male		female	
	mean	s.d	mean	s.d
Dental caries surface	7	8.09	6.4	6.2
filling surface	1.5	3	0.61	1.4
missing surface of female	0.55	2.33	0.32	1.3
DMFs	8.8	10.27	7.3	6.3
DMFt	4.8	3.31	4.04	2.76

Table 4 compares of dental caries between male and female children

What we see today is that research, reports, and studies have shown that females are more susceptible to caries in addition to males, due to hormonal changes and conditions that greatly contribute to the

development of caries, but according to the samples and research we conducted regarding children, we found that males are more affected, and to some extent the percentages are close, and these changes follow. Basically, the culture of the parents and the extent of their interest, in addition to the lack of water fluoridation system in Babylon Governorate, what we see today is that children are vulnerable to caries on a widespread basis.

	male		female
	mean	S.D	mean S.D
PL	0.7	0.58	PL 0.64 0.45
GI	0.46	0.54	GI 0.29 0.4

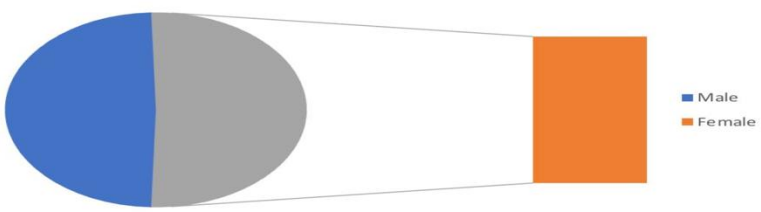
Table 5 compares of Oral hygiene between male and female children

plaque (PLI) and gingival (GI) indices were found ،Statistically, the non-significant difference was found between the PLI of males and females (PLI=0.7)

While the gingival index is slightly different in females than males, this explains to us that oral hygiene between males and females is almost equal because it follows the culture of the parents and the extent of the child's compliance with instructions and attention to oral health.

Discussion

The study included 136 samples distributed according to ages under the age of ten, to approximately 100 samples, which are the group of children most affected by tooth decay according to indicators due to the negligence of the parents and the lack of continuous visits to the dentist, in addition to several factors that caused the significant development and exacerbation of tooth decay in children.



This study addressed the question of whether gender differences in the experience of tooth decay were observed during samples from child patients coming to Babylon University clinics from the same governorate. A basic insight was observed:
There is great neglect of the child's environment, as we noticed during collecting samples a clear spread of tooth decay among children, especially those between the ages of 6-9 years. We also found that males have a slightly higher rate of developing tooth decay within these ages, despite the similarity in incidence with females. This proves that children under the age of As adults, they suffer from tooth decay. This is a result of parents neglecting oral hygiene rather than monitoring their children. Some research around the world has found that under the age of ten, children are exposed to a large percentage of sweets and substances that contain artificial sugar,This promotes the growth of bacteria and the development of their caries process.
In view of the results that there is a very serious proportion in the treatment of tooth decay in children at the advanced level that were collected, a noticeable difference appeared in some things on the surface, such as those that children's desire to share their teeth is very important, as most parents bring their young children their time and complain about their children eating Their teeth, and this is what we have are very serious indicators in providing children's dental health and monitoring them in general, so measures and intensification of programs to combat the causality must urge society to pay attention to aspects of children's oral health.
It has been proven that there are significant changes in the criteria for tooth decay, its treatment, and the rate of tooth decay and bad mouth disease

Conclusion

In the current study, the poor oral health status of children come into the university clinic of babylon between the ages of 6 and 14 years with a high Prevalence of tooth decay was confirmed.

Poor oral hygiene practices dominate oral health care attitudes in the population examined, which partly indicates a lack of dental services as well as parental neglect of their children's dental health, as many parents

believe that baby teeth are followed by permanent teeth and do not need to be reviewed. But this soon reflects negatively, as in most cases we found that malocclusion is linked to oral hygiene and the experience of tooth decay, which is why educational, preventive and therapeutic programs should be implemented to improve children's dental care

We also noticed that girls are the most interested in and interested in the . health and restoration of their teeth, and they suffer less from tooth decay than male children. This is what It is explained that negligence does not depend on the parents only, but on the extent of the child's compliance with preventive instructions and his interest in the health of his teeth

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	Gi	pl	dmft	dmfs	ms	fs	ds	gender	age
محمد قاسم حسن	0.66	0.5	2	2	0	0	2	male	11
	0.83	0.62	3	9	0	3	6	female	10
	0	0.91	3	9	0	0	9	female	7
	0.33	1.33	5	5	0	0	5	female	9
	0	0.54	3	9	0	0	9	female	9
	0	0.54	6	11	0	0	11	female	11
	0	0	4	4	0	0	4	male	5
	0	0.54	4	12	4	0	8	female	10
	0.33	0	3	3	0	0	3	male	7
	0.041	0	1	1	0	0	1	female	6
	0.62	0.66	1	1	0	0	1	male	5
	0.62	0	1	1	0	0	1	female	5
	0.33	0.29	2	2	0	0	2	male	6
	0.58	0.58	7	14	0	0	14	female	6
	0.28	0	2	4	0	0	4	male	7
	0.33	0.29	3	7	0	1	6	female	6.5
	0	0.08	3	4	0	0	4	male	4
	0	0.04	3	4	0	1	3	female	5
	0.37	0.82	5	5	0	0	5	female	6
زهراء حيدر داخل	0	0.87	6	10	0	3	7	male	7
	0	0	1	1	0	0	1	female	4
	0.08	0.29	5	7	0	2	5	male	7
	0	0.208	2	4	0	0	4	female	5
	0.33	0.29	0	0	0	0	0	male	14
	0.16	0.041	2	4	0	0	4	female	5.5
	0.125	0.5	4	6	0	2	4	male	7
	0.208	0.166	7	10	0	0	10	male	10
	0	0.5	6	14	0	0	14	female	7
	0	1.25	4	8	0	6	2	male	10
	0	0	3	3	0	0	3	male	6
	0.08	0.29	7	9	0	4	5	male	9
	0.125	0.08	4	4	0	0	4	male	11
	0	0.125	3	5	0	0	5	female	7
	0.208	0.375	7	11	0	0	11	male	6
	2	2	1	5	0	0	5	female	12
	0.083	0.208	4	4	0	0	4	female	11
	0	0.291	5	7	0	3	4	female	8
	0.58	0.291	0	0	0	0	0	male	13
	0	0	2	3	0	0	3	female	5
	0	0	2	2	0	0	2	male	4
شهد سعد كاظم	0.58	1.08	6	8	0	0	8	male	9
	1	1.37	1	2	1	0	1	female	10
	1	1	7	10	0	0	10	female	8
	1	1	3	4	0	0	4	male	8

	0.83	1.33	7	10	9	0	1	male	10
	1	0.083	10	18	0	0	18	male	8
	0.79	0.83	0	0	0	0	0	female	14
	1	0.58	2	3	1	0	2	female	8
	0	0	6	10	0	1	9	female	5
	2	2	2	2	0	0	2	male	11
	0	0	7	8	0	0	8	female	6
	0.25	1	5	5	0	0	5	male	9
	0	0.25	4	5	0	0	5	male	7
	0	0.66	2	4	0	0	4	male	8
	0.25	1	5	7	0	2	5	female	8
	0.083	0.125	5	7	0	0	7	male	13
	0.083	0.16	3	9	0	8	1	female	8
	0.125	1	5	12	0	0	12	female	9
	1	1	8	12	0	6	6	male	10
	0.5	1	0	0	0	0	0	female	13
	0.5	1.16	6	18	9	0	9	female	10
رسول احمد هادي	1	2	10	17	0	0	17	male	6
	0	0.5	4	5	0	0	5	female	8
	0	1	4	7	0	6	1	male	13
	0	1.08	5	13	0	2	11	male	8
	0	1.12	5	5	0	2	3	male	13
	0	1.12	5	10	0	0	10	female	9
	0	1.5	7	5	0	3	2	female	8
	1	1	4	4	0	0	4	female	10
	1	1	4	2	0	0	2	male	6
	0	0.6	1	8	0	5	3	female	5
	0.2	1.16	4	10	0	0	10	male	11
	0	0.87	10	4	0	0	4	female	13
	0	1.2	2	52	0	10	42	male	5
	0	1.2	17	48	0	18	30	male	6
	0	0.7	7	19	0	0	19	female	8
	0	0	5	13	0	3	10	male	5
	0	0.7	5	7	0	0	7	female	12
	2.2	2.5	5	6	0	1	5	male	6
	1	0.125	4	6	0	0	6	female	9
	1	1.2	6	8	0	0	8	male	7
	1	1.08	4	7	0	0	7	male	5
	0	0.62	3	4	0	1	3	female	6
أسماء هادي زيدان	0	0	1	1	0	0	1	female	4
	0.125	0.83	4	10	3	0	7	male	6
	0.33	0.45	3	4	0	0	4	female	8
	1	1.33	1	1	0	0	1	female	12
	1	0.125	5	8	0	5	3	male	11
	0	0.04	2	2	0	0	2	male	5.5

	0.37	0.33	2	7	0	0	8	male	7
	2.5	2.5	3	7	0	0	7	male	6
	0.708	0.33	7	24	0	0	24	female	7
	0.125	1	6	9	0	0	9	female	6
	0	0.91	6	12	0	0	12	female	8
	0	0.33	5	7	0	2	5	male	7
	0.166	1	16	46	0	2	44	male	6
	0	0	3	9	5	0	4	female	7
	0	1.08	3	3	0	0	3	male	11
	0	0.83	2	2	0	0	2	female	10
محمد قاسم عبد العباس	0.37	0.91	2	5	0	0	5	female	6
	0.875	0.375	5	5	0	0	5	male	5
	0.125	0.58	0	0	0	0	0	female	14
	0	1	5	13	0	5	8	female	8
	0	0.48	1	1	0	0	1	female	5
	0.5	1	5	8	1	2	5	male	5
	1	1	3	4	0	1	3	male	8
	1	1	3	4	0	0	4	male	7
	0.2	1.32	1	2	0	0	2	female	6
	0	0	5	8	0	3	5	male	9
	0.458	1	6	12	1	2	9	female	6.5
	0.66	1.5	0	0	0	0	0	male	14
	0.33	0	4	7	1	2	4	female	5
	0.208	1	5	6	0	1	5	female	8
	0.541	1.04	9	16	0	7	9	male	5
	0	0.58	6	8	0	4	4	male	6
	0.16	1	5	12	0	0	12	female	8
اية جبار كاظم	1	1	14	35	8	7	20	male	7
	0	0.5	4	5	0	0	5	female	7
	1	1	5	6	1	0	5	male	12
	1	1	16	42	0	0	42	female	6
	0	0.5	4	10	0	0	10	female	8
	1	1	6	6	0	0	6	male	9
	0	1	5	5	0	2	3	male	11
	0	0.416	2	2	0	0	2	female	8
	0	0	1	1	0	0	1	male	7
	0.5	0	4	6	0	3	3	male	9
	0.416	1	10	11	0	0	11	female	6
	0	0.33	4	5	0	0	5	female	8
	0.333	0.833	6	18	15	0	3	male	11
	1	1	8	14	0	0	14	male	8
	0.125	0.58	5	5	0	2	3	male	6
	0.5	1	5	8	1	2	5	female	7
	0.708	0.33	9	9	0	0	9	male	8
	1	1	6	8	0	0	8	female	6

	0	0	1	2	0	0	2	female	5
	0.333	0.5	1	1	0	0	3	male	12
	0.125	1	2	7	0	3	4	female	6