Review Article

Incidence of Dental caries at different age groups

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Abstract

Background: *Dental caries is oral hygienic related diseases and starts by formation of acid which can cause the breakdown of tooth. It can occur at every age and if left untreated in childhood then it becomes a major problem and thus causes irreversible damage of tooth. There are four main stages of dental decay, the first two stages are not painful but the last two stages are very painful because in these the dental decay move towards the nerves and blood vessels present in tooth. The incidences of dental caries are present in every age from childhood to adults and then at older age.* ***Objective:*** *The main objective of this study to determine that at which age the incidence of dental caries are occur mostly.* ***Methodology:*** *A prospective study was conducted for incidence of dental caries at different age groups. The data was collected from almost 100 people of different age groups having proper oral hygiene health and having no proper oral hygiene health. It is also associated in the study that how childhood negligence in dental caries results into irreversible damages of tooth.* ***Results:*** *It was found from the study that if oral hygiene is not maintained then dental caries can be occur at early age and if maintained then there are very less chances of dental caries. Mostly children don't focus in maintaining their oral hygiene and thus develop dental carries in early ages and when these caries left untreated it become irreversible tooth damage.* ***Conclusion:*** *The chances of developing dental caries depend upon the hygienic condition of mouth. The study concluded that occurrence of dental caries occur at any age and in early childhood the dental caries are not painful and it is healthy to treat it at 1st stage so that the further damage of tooth can be prevented.*

Keywords: Age, Oral hygiene, Nutritional requirements, Risk assessment

Introduction

Dental caries is a deposition as well as damage of tooth due to production of acids by the bacteria present in mouth. It is a transmissible infectious as well as oral hygiene related disease and also known as tooth decay. Tooth decay is mostly occurring when oral hygiene is not maintained. Tooth decay start when some of the food particles stick to the smooth tooth surfaces and then produce a significant amount of acid that start the decaying of tooth show in figure 1 (Barira Islam, 2007). Mutants of streptococci are considered as most important bacteria in the process of tooth decay. Tooth decay can occur at every age from childhood to adults and also at older ages. Young children are at more risk of tooth decay as in early childhood carries whereas tooth decay in adults starts when microbes get access to the roots of their teeth. Dental carries can be start on two basic parts of teeth such as occlusal caries and interproximal caries.
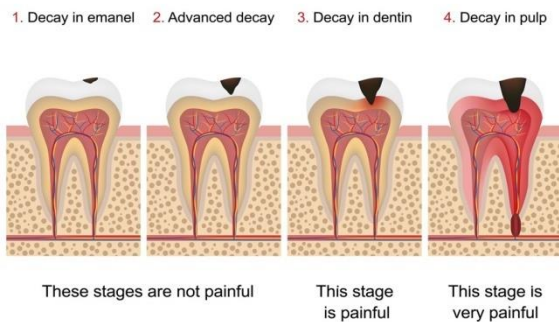

Figure 1: The stages of tooth decay.

There are four main stages of tooth decay. First two stages are not painful while last two stages are very painful. At first stage the decay is only occur in enamel and considered as a spot on the tooth. While in second stage this decay is getting some worsen and known as advanced decay. In the third stage the decay is occur in dentin as it is a dense and strong bony tissue which make bulk portion of tooth (Chrisopoulos *et*

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al., 2016). At last the decay move towards pulp portion of tooth which contains nerves as well as blood vessels in it and thus due to presence of nerves and blood vessels this stage of decay is very painful.

Occlusal caries are the caries that occurs or form on the top portion of tooth as food particles are directly in contact with tooth. Interproximal caries are the caries that occur in between the teeth. When the oral hygiene is not maintained then microbes present in mouth start to digest the sugars and thus metabolized or convert them into acid as a waste product, which starts decaying of tooth. These acids are not so week and not so strong but strong in a way that this acid starts dematerialize the enamel of tooth and begin to form tiny holes on the surface of tooth as it is first step in tooth decay and teeth are unable to reinforce as well as capture calcium and phosphate to maintain the integrity of teeth.

Objective

The study was conducted to determine the incidences of dental caries in different age groups and also to determine that which factors are important in developing dental caries.

Literature review

J O conducted a study to check the effect of nutritional status on development of dental caries in primary teeth. This study was conducted in between 1481 children of varying ages from 1 year to 13 years old. The results show that almost 41% of children from these are malnourished and the incidences of dental caries are high in malnourished children as compare to others because malnourished decreased or delay the development of tooth due to which dental

caries in primary teeth are increased (J.O.Alvarez, 2006).

Heba A Alkarimi conducted a study to determine the development of dental caries in school going children. This study shows that the development of dental caries in children is highly dependent on their age, height and weight. In this study almost 417 children were taking and out of which 416 take part in this study and provide their complete data. The results of this study shows that mostly childhood caries left untreated which further becomes a developed cavity of fourth stage and also growth of children become poor (Heba A. Alkarimi, 2014).

Michelle Hurlbutt et.al conducted a study on best practice approaches used in management of dental caries. This study shows that risk assessment is considered as a best and evidence based management for dental caries. By using this method the dental decay is managed by patient level not at tooth level. The result of this study shows that this method is considered as best practicing approach rather than using traditional methods (MichelleHurlbuttRDH, 2014).

Margherita Fontana et.al conducted a study on evidence based dental caries, their risk assessment and also how to treat these dental caries. This study shows that dental caries is an dietary related diseases and if left untreated then can cause harm and breakdown of hard tissues of tooth such as dentine. In this study medical model is used where protective agent or factors are balanced with the disease enhancing agents with the risk assessment. This is done so that prevention as well as management of caries can be occurred so that irreversible damage

of teeth can be prevented (MargheritaFontanaDDS, 2009).

Acevedo et.al conducted a study on the spreading as well as frequency of mutans streptococci in caries free and caries affected children. Streptococci is considered as most common pathogen for the development of dental caries. During this study the bacterial identification procedure has to be done to indicate the exact pathogen involving in development of dental caries. The results show that mutans streptococci are mostly present in dental caries patient whereas they are present in fewer amounts in caries free group (Acevedo AM, 2008).

Anatoly A Kunin conducted a study about difference in chemistry of enamel at different age and how they develop dental carries. This study is about the consequences and events which can lead to dental caries and also studied other pathological process that occurs in enamel of tooth. The caries process mostly develop in childhood and lessly develop in adult as well as at older ages and thus it is concluded that age is very important factor in developing caries (Anatoly A Kunin, 2015).

Manji F et.al conducted a study and the purpose of this study is to determine the pattern of dental caries in adults living in rural areas. This study was conducted in almost 1131 people having age between 15 years to 65 years. This study shows that at the age of 15-24 years old there is low prevalence of cavitations whereas in the age of 24-34 years pulp tissues also take part in caries and thus there are chances of loss of tooth at that age. Thus the results show that caries process is continuous and take place at every age and is not limited to only one age of life (Manji F, 2020).

Merrilyn conducted a study to determine the impact of children in developing dental caries in children at the age of 1-6 years. The study shows that there are different determinants and factors that affect on the early childhood caries development such as diet, feeding factors, attributes of parents, knowledge as well as belief of parents. The results show that if parents pay attention on the oral hygiene of people then the dental caries can prevented at early age but if not maintained then there are more chances or risks of early childhood dental caries (MerrilynHooley, 2012)

Methodology

Study design

Prospective observational study

Study duration

3 months

Sampling technique

Convenient sampling technique

Sample size

100

Inclusion criteria

- People having healthy teeth
- People having dental decay
- People have good health
- Patients never have age from 3 years to 40 years

Exclusion criteria

- People having direct as well as indirect restorations in military regions
- People having neurological diseases
- People having some other acute or chronic disease

Statistical Tool

SPSS version 19

T test

ETHICALCONSIDERATION

- Written informed consent was taken from all the patients.
- All informed and collected data will be kept confidential.
- Data will be saved in personal laptop and hard copies from data will be in locker.
- Participants will remain anonymous throughout the study
- The subject was informed there are no disadvantages or risk on the procedure of study.
- They were also informed that they are free to withdraw at any time during the process of the study

- The data was collected y using data collection sheets.
- The data was collected from different age groups people having different activities.
- Demographics data should be collected from all participants of research.

DATA ANALYSIS

The statistical analysis of data is done by using SPSS new version.

T test was applied in statistical P-value<0.5 is analyzed.

Results

DATA COLLECTION

Table 1: Comparison of different pairs in Rlp sections in plains

		Mean	N	St. Deviation	Std. Error Mean
Pair 1	Rlp-ms1	47.607	28	6.0558	1.1444
	Rlp-ms2	47.500	28	5.6699	1.0715
Pair 2	Rlp-Is1	78.018	28	5.9620	1.1267
	Rlp-Is2	79.143	28	5.6056	1.0594
Pair 3	Rlp-ss1	68.536	28	5.3280	1.0069
	Rlp-ss2	70.125	28	4.9975	.9444
Pair 4	Rlp-pg1	66.911	28	6.0247	1.1386
	Rlp-pg2	71.929	28	5.8178	1.0995
Pair 5	Rlp-ml-pg1	-20.250	28	3.1783	.6007
	Rlp-ml-pg2	-19.161	28	3.3056	.6247
Pair 6	Ov erjet1	9.7679	28	2.49252	.47104
	Ov erjet2	3.7321	28	2.40556	.45461

The table 1 shows that a paired sample t-test was conducted to compare the incidence of dental caries at different age group. The size of sample is 28 and there is a significant difference in the scores of dental caries. As in pair 1 the results of rlp-ms1 is almost equal to rlp-ms2 which shows that there are no significant difference and the standard deviation shows that the results are not standard as the result is greater than 0.5. The results of pair 2 shows that there is not so much significant difference in Rlp-ls1 and Rlp-ls2 and standard deviation shows that the result is up to standard as the value is lower than 0.5. The results of pair 3 show that there is a significant difference in between two samples and the mean standard deviation shows that the result is not up to standard but the standard mean deviation of Rlp-ss2 is near to standard. The result f pair 4 shows that there is a huge difference in between Rlp-pg1 and Rlp-pg2 and results are not up to the standard. The results of pair 5 shows a very minute difference and also the deviation is near to standard but not proper as the results are little bit higher than 0.5 The result of pair 6 shows that there is a huge and significant difference between Ov rejet1 and Ov rejet2 and thus std. mean is up

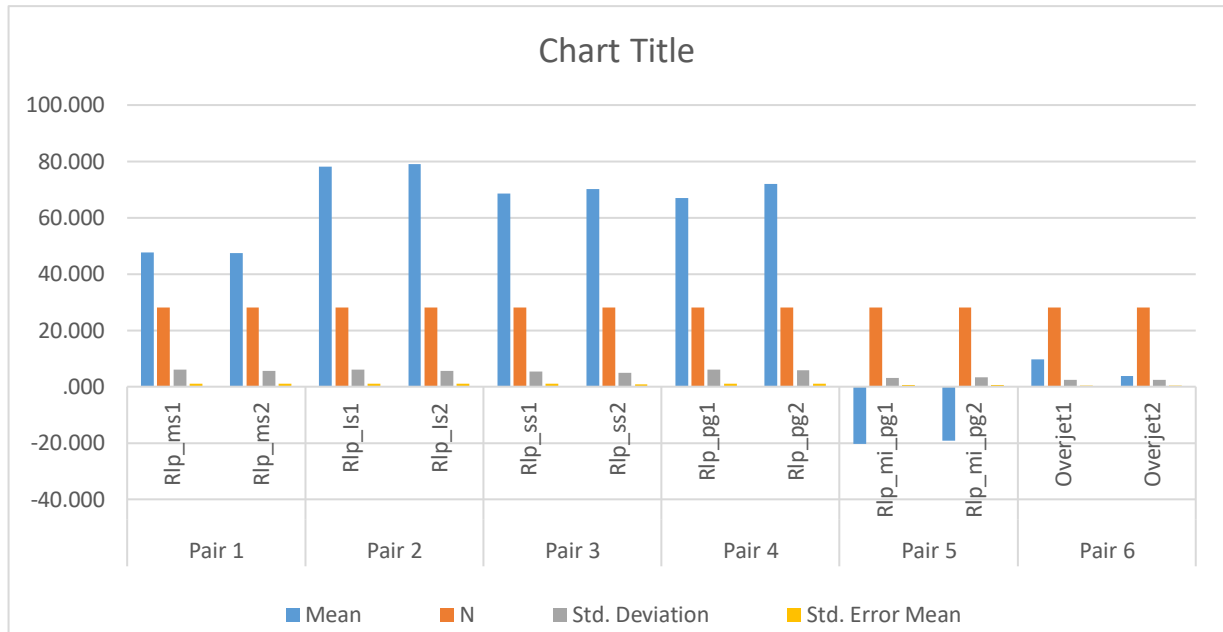to the standard as the results are below then   0.5.

Figure 2: Pair wise show with mean & S.D

This is the graphical representation of above given data and from this it is concluded that there is a significant difference is present in all pairs except pair 6 IN FIGURE 2

Whereas the Std. error mean is up to the standard and thus the results of pair 6 is up to standard.

Table 2: pair wise Rlp plains statistical analysis p.value

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Rlp_ms1 - Rlp_ms2	.1071	3.0863	.5833	-1.0896	1.3039	.184	27	.856
Pair 2	Rlp_Is1 - Rlp_Is2	-1.1250	3.7159	.7022	-2.5659	.3159	-1.602	27	.121
Pair 3	Rlp_ss1 - Rlp_ss2	-1.5893	2.9252	.5528	-2.7235	-.4550	-2.875	27	.008
Pair 4	Rlp_pg1 - Rlp_pg2	-5.0179	4.6914	.8866	-6.8370	-3.1987	-5.660	27	.000
Pair 5	Rlp_mi_pg1 - Rlp_mi_pg2	-1.0893	3.2405	.6124	-2.3458	.1673	-1.779	27	.087
Pair 6	Overjet1 - Overjet2	6.03571	3.13560	.59257	4.81985	7.25157	10.186	27	.000

Paired Samples Test (table title)

The results shows in table 2 that the mean standard of all the pairs are up to the standard and in pair 3 and 6 the result is 0 which shows that there is no significant difference in them. Thus it shows that the incidence of dental caries in early childhood

is increased as compare to in adults because children don't maintain the oral hygiene which results in dental caries while adults maintain their oral hygiene conditions.

Discussion

The study was conducted to check the incidence as well as prevalence of dental caries in different people of different age groups. The objective of study was to find the different factors affecting on the development of dental caries in different age. The effects of different factors such as age, nutritional requirement as well as influence of parents to maintain the oral hygiene of children are discussed to determine the prevalence of caries.

The results showed that dental caries is highly dependent on the nutritional requirement because if nutritional requirement of children not completed then the growth of tooth don't take place which results in weaker tooth and thus tooth decay start. The results was similar to a study conducted by J O Alvarez et al. whose study stated that if nutritional requirement is not fulfilled of children then there are more chances of dental caries in children.

The result show that if oral hygiene is not maintained then the dental caries occur in early childhood. There is also some impact of parents to maintain the hygiene of children so that prevalence of dental caries is reduced. The result was similar to a study conducted by Merrily Hooley et al. whose study stated that the dental caries are highly dependent on parents in early childhood. The results shows that if management of dental caries occur at the risk assessment then the maximum damage of tooth can be prevented and the result was similar to the study conducted by Michelle et al. whose study stated that if the management of dental caries can take place then irreversible damage can be prevented.

Conclusion

Dental caries is the dietary as well as infectious disease in which breakdown or damage of tooth starts when oral hygiene is not maintained and the microbes such as mutans of streptococci began to acid production that starts the breakdown of enamel. There are various factors that can promote the tooth decay such as age, nutritional requirements and so on. The study indicated that dental caries take place at every age as it is a continuous process but the chances of developing caries in early childhood is more common than in adults because children are unable to maintain oral hygienic conditions. The results of t-test should be lower than 0.5 and if some of the results are higher than the 0.5 it means that the study is not satisfactory and there is a need to have some amendments in study to gain accurate results. The results of this study is almost lower than 0.5 which shows that the study is satisfactory and there is no need of amendments.

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