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A Prevalence Study of Dental Caries in Different Socio- Economic Status Among Clientele of A Tertiary Dental Centre at Jabalpur, India

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ABSTRACT

A Prevalence study of dental Caries among personnel and their families of all socio- economic status was carried out in Jabalpur, India for the period of two years. To find the current prevalence of dental caries among different age group, including difference during particular months of year by studying all available records. This was also compared with the disease in previous year which showed increase of dental caries Prevalence Rate of Dental caries was found to be highly significant in 2010 among all classes of socioeconomic status, with difference see significantly in lower class and families. Prevalence Rate of Dental caries was found to be highly significant in all classes of socioeconomic status, while maximum cases had occurred in age group 20-25 years. Dental caries has increased significantly in upper class, lower class and amongst families while no increase is seen in middle class in 2010. Prevalence of Caries was a observed much more in lower socio- economic status. Heavy Workers in Upper class and families were most affected than in any other class. However, the limitation of study is that population were not stationary due to frequent transfer in/out of personnel, as it gives only a moderate estimation of problem, It was seen that there is increase in Caries among Hindus & Sikhs than other religionA two year study revealed a better prevalence rate of Dental Caries than a Cross-sectional study. Prevalence Rate of Dental caries was found to be highly significant in 2010 among all classes of socioeconomic status, with difference see significantly in lower class and families

Key words: Prevalence study, Dental Caries, Socio-economic status, Tertiary, Dental centre

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INTRODUCTION

Dental caries is widely prevalent in all strata of society. An attempt is made to find out current state of dental Caries among different classes of socio- economic status of Personnel and families and also to find out whether there is increase in dental caries in comparison to last year.

Dental caries is increasing, interlia due to modern ways of fast living, lack of time for proper oral hygiene and changes in food habits. Carries management by risk assessment is considered best practice in the prevention and treatment of dental caries disease, yet the actual number clinical practices that successfully implement the evidenced based concept is generally accepted as small [1].

Dental caries is a transmissible bacterial mediated disease of the oral cavity that leads to net mineral loss in the teeth resulting in white spot lesions or cavitations and potential tooth loss. This disease is prevalent in all age groups and is a chronic disease for many patients[2].

Historically, the disease model involved two primary pathogens mutans streptococcal and Lactobacillus, however, additional pathogens are being identified every year and some 40 different bacteria have now been implicated in this disease [3,4]. Current bio film studies suggest dental caries is a pH dysfunction of the normal biofilm on the teeth [5].

A six year retrospective university study validated certain factors used in many caries risk assessment (CRA) forms using data from 12,954 predominantly adult patients [6]. The factors studied were later organized into three categories; disease indicator, pathogenic factors, and protective factors. It is the balance of these factors that determine the expression of caries disease (demineralization) or health [7]. Without addressing the causative role of behavior (and choices) in caries disease and its treatment, no intervention (restorative or chemical) will stand a great chance of success. The treatment of dental caries boils down to three factors for most patients:-

a. Biofilm: either they have the wrong bacteria (predominantly Cariogenic) in their biofilm, or the bacterial make up they do have are producing too much acid.
b. Destructive lifestyle habits (diet, drugs, etc): either they have too many obvious or hidden sugars in their diet or they snack too frequently.
c. Saliva: either they don't have enough saliva or buffering capacity, or they may have medication induced hyposalivation [8,9].

The healing of pathogenic biofilm may involve both medical treatment and the modification of poor dietary decisions or other injurious habits. Lifestyle choices and true case acceptance play a significant role in successfully treating dental caries.

Whole Person Coaching in the Dental Profession (WPC) is an accelerated learning and development method used to initiate change and create holistic, sustainable, positive

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momentum in an individual's life. Through its use, dental professionals and patients alike become more self-aware, self-directed, and motivated to face and overcome the challenges preventing the positive changes they seek. [1]

Dental caries (tooth decay) occurs when "cavity-causing" bacteria, foods usable to the bacteria and susceptible teeth are in contact with each other long enough to allow bacterial by-products to demineralize the enamel of the teeth.[1]

MATERIAL & METHODS

All cases treated at a Dental Centre were retrospectively analyzed. All the registers and documents for prevalence of dental Caries among different socio-economic classes of personnel, age wise and month wise for the year 2009 and 2010. Jabalpur cantonment had 486 Class I socio-economic classes of personnel, 4581 Class II socio-economic classes of personnel & 13720 Class III socio-economic classes of personnel ,beside about 17000 families Kuppuswamy socio-economic scale updated version of 2007(11) were followed for ascertaining the socio-economic status of personnel. Three factors are taken in this scale:-

(a) Education (score ranging from 1 to 7 ie illiterate to profession/honours),
(b) Occupation (score ranging from 1 to 10 ie unemployed to profession) &
(c) Family Income per month (score ranging from 1 to 12 ie Rs 1000/- to Rs 20000/-)

Socio-economic statuses are than classified into 5 Classes. Class I (score ranging from 26-29), Class II (score ranging from 16-25), Class III (score ranging from 11-15), Class IV (score ranging from 5-10) and Class V (score less than 5). Another method of dividing the Classes are to broadly club groups into 3 main Classes ie.

Upper Class-include class I only.
Middle Class- includes class II & III
Lower Class- includes class IV & V

In this study, all cases of Dental Caries were classified as per the above mentioned 3 socio-economic status.

RESULTS

Prevalence-wise distribution of Dental Caries:

There has been increase in dental caries in all Classes of personnel in one year. Overall the prevalence in 2010 was found to be more than in 2009.which has been statistically significant. The details are as per Table 'No. 1.

Age wise distribution of Dental Caries:

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There has been highly statistically significant increase in dental caries in younger age groups compared with previous year from 20 to 40 year. The details are as per table no.2.

Type of work & Dental caries:

There is highly significant increase in upper class in a period of one year. In a period of one year, Dental Caries in mild & light Workers is found to be progressively increased, which has been highly statistically significant. The details are as per table no.3.

Month-wise distribution of Dental Caries in all Classes:

No significant difference in occurrence could be ascertained because in 2009 it was more during June July, August and in 2010, more in month of January, February and March 2010. The details are as per table no.4.

Table No 1: Percent-Wise Distribution of Dental Caries of Classes of Socio-Economic Status

S.No.	Socio economic categories	No. Of persons(2008)				No. Of persons(2009)			
		Normal	Affected	Percentage	Prevalence rate	Normal	Affected	Percentage	Prevalence rate
1.	Class I (UPPER CLASS)	377	109	22.4	28.91	436	196	44.0	44.95
2.	Class II,III (MIDDLE CLASS)	2780	1801	25.0	34.78	2581	1200	46.4	46.49
3.	Class IV, V (LOWER CLASS)	9394	3826	39.0	40.72	17218	8560	49.7	49.71
4.	Families	11673	5327	32.0	45.63	17000	8931	52.5	52.53
Total		24224	11063	30.0	45.66	37285	18887	50.0	50.65

The difference of affected by dental caries was found to be highly significant in 2 years among personnel and their families of lower class. $x^2 = p < 0.001$

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Table 2: Age-Wise Dental Caries of Classes of Socio-Economic Status

	CATEGORY	2009 RANGE OF AGE							2010 RANGE OF AGE						
		20-25	25-30	30-35	35-40	40-45	45-50	TOTAL (%)	20-25	25-30	30-35	35-40	40-45	45-50	TOTAL (%)
1.	Class I UPPER CLASS)	21 (0.86)	13 (0.74)	35 (2.60)	7 (0.31)	24 (1.27)	9 (0.62)	109 (0.98)	7 (0.10)	45 (0.74)	59 (2.40)	37 (1.97)	30 (2.48)	18 (2.69)	196 (1.03)
2.	Class II & III MIDDLE CLASS)	407 (16.82)	312 (17.8)	211 (15.69)	427 (19.11)	333 (17.69)	111 (7.73)	1802 (16.30)	503 (7.55)	307(5.08)	229 (9.34)	131 (7.1)	29 (2.40)	11 (1.64)	1210 (6.40)
3.	Class III LOWER CLASS	855 (35.34)	609 (34.81)	485 (36.08)	813 (36.39)	611 (32.4)	453 (31.56)	3826 (35.34)	3000(45.03)	2700(44.73)	1050 (42.83)	980 (52.43)	529 (43.82)	301 (44.99)	8560 (45.29)
4.	Families	1136 (46.96)	815 (46.59)	613 (45.61)	987 (44.18)	914 (48.56)	862 (60.06)	5327(48.15)	3151 (47.30)	2983(49.42)	1113 (45.41)	721 (38.57)	624 (51.69)	339 (50.69)	8931 (47.26)
Total		2419	1749	1344	2234	1882	1435	11063	6661	3035	2451	1869	1207	669	18897

$x^2 = 225.17$ p<0.001

(Highly significant difference of Dental Caries among of classes of socio-economic status and families on 20-25 age group in 2009 and2010).

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Table-3: Type of Work Wise Affection by Dental Caries of Classes of Socio-Economic Status

S.No.	categories	2009				2010			
		HEAVY WORKERS	MODERATE WORKERS	MILD WORKERS	LIGHT WORKERS	HEAVY WORKERS	MODERATE WORKERS	MILD WORKERS	LIGHT WORKERS
1.	Class I socio-economic status(UPPER CLASS)	21	27	19	42	81	63	13	39
2.	Class II & III socio-economic status(MIDDLE CLASS)	513	409	381	498	561	383	16	240
3.	Class III socio-economic status(LOWER CLASS)	1017	1113	795	901	3663	2853	51	1993
4.	Families	1706	1535	923	1163	2991	2863	113	2964
Total		3257	3084	2118	2604	7296	6162	193	5236

There is highly significant increase in Class I socio-economic status(UPPER CLASS) and families in one year.

$(x^2 = 408.91 \quad df: 3 \quad p < 0.001)$

There is highly significant difference in prevalence of Dental Caries among mild & light workers.

$(x^2 = 96.18 \quad df: 3, \quad p < 0.001)$

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Table-4 Month Wise Affection by Dental Caries of Classes of Socio-Economic Status

S.No.	Category	2009											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1.	Class I (UPPER CLASS)	08	05	06	09	13	11	3	13	17	08	08	07
2.	Class II & III (MIDDLE CLASS)	157	103	213	191	235	117	123	211	90	183	87	91
3.	Class III (LOWER CLASS)	201	197	321	529	803	287	511	187	213	301	167	109
4.	Families	360	272	571	257	590	815	380	503	417	345	509	410
	Total	726	577	1111	986	1641	1228	1017	914	737	838	771	617

s.no.	Category	2010											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1.	Class I (UPPER CLASS)	9	23	27	15	14	11	15	13	12	16	17	24
2.	Class II & III (MIDDLE CLASS)	241	203	121	73	17	37	111	103	93	103	61	37
3.	Class III (LOWER CLASS)	1461	1542	533	421	227	169	311	417	871	1125	993	692
4.	Families	1527	1331	921	613	1103	841	1017	203	671	271	289	144
	Total	3238	2899	1602	1122	1361	1058	1454	736	1647	1515	1360	897

INFERENCE: NO RELATIONSHIP OF OCCURANCE OF DENTAL CARIES AND MONTHLY VARIATION EXIST

DISCUSSION

The dental caries has been linked directly with intake of fermentable Carbo-hydrate diet like sucrose and starches, area of long term optimum water fluoridation and habitual sugar eater [2]. It is known that the intake of Sweet and Sugar are more in middle & lower classes. The child poses the greatest public health problem. In a study in New-Zealand, Dental Caries was found to be maximum above the age of 15 years, similiarly, we have observed more cases of dental caries occur around 20-25 yrs and till 40 years than the trend shows decline in incidence and is in conformity with the above study.

In another study by Verma et al have found 55% prevalence rate in age group 3-12 yrs and more in those belonging to lower socio-economic status which corresponds to more number of cases of dental caries in same group [13].

Preventive techniques should be directed towards control of one of the essential factors, the susceptible tooth, bacteria or carbohydrates by fluoride therapy, plaque control programme. Diet analysis and food selection including communal fluoridation in indicated [5].

In prevention of caries in children, promotion of breast feeding, tooth brushing by parent of children below 6 years twice a day, use of carbohydrates to be encouraged, fresh soups, fruits and salads are advisable.

Tooth cleaning before sleep is to be practiced [6]. An improvement of general health and malnutrition reduces caries [7]. Further it is vital to brush the teeth with proper techniques, frequency and regularity.

General awareness among layperson to be focussed by frequent health education regarding oral hygiene including frequent visit by families and children to a dental centre. The children in this population have higher caries prevalence and a higher level of untreated caries than the national means as reported in NHANES III. The high level of untreated decay found in this particularly disadvantaged community suggests that enhanced dental services targeting the very young are needed in these cases

Oral health of the young has been reported to be associated with the place of residence, due to differences in socio-economic status.

The geographical distribution of dental caries further supported estimates of the protective effects of high fluoride levels in drinking water.

Effect of fluoride on caries prevalence still exists, and association with the socio-economic status was confirmed.[14]

The importance of fluorides in prevention of Caries, cannot be over-emphasized it is an essential nutrient and is a tool for caries prevention. Systematic fluorides has a role in Cario-stastic mechanism, topical fluorides, fluorides varnishes, dentifrices, rinses and tablets has its role in prevention and treatment of caries.

Dental Caries, commonly known as cavities or tooth decay, are caused by acid producing bacteria living in the oral environment that proliferate in the presence of sweet and sticky foods.

Small cavitations do not usually produce severe ongoing or sporadic pain and require small restorations.

Caries experience is measured by the decayed missing and filled teeth index (DMFT) for permanent (adult) teeth or by the dmft index for deciduous (Juvenile) teeth. Both indices

measure how many teeth (T/t) teeth. Both indices measure how many teeth (T/t) are decayed (D/d), missing (M/s) or filled (F/f). Neither index differentiates between a tooth with minor problems and one with major problems, nor do they provide a direct indication of the discomfort or dysfunction.

To get a more accurate picture of decay, another index, the decayed missing and filled surfaces (DMFS) is used. By measuring the number of decayed/missing/filled surfaces on each tooth, rather than the tooth as a whole, The DMFS provides more detail about an individual's caries experience. It is also important to note that the DMFT/dmft and experience.[10]

CONCLUSIONS

Globally, Dental Caries is progressively increasing. Its role in causation of some heart diseases are well known. The present study has also showing upward trend in prevalence of Dental Caries. The problem of Dental Caries is more acute in persons with lower socioeconomic status particularly in younger people till 40 years as evident in this study. This study also indicates increase prevalence particularly in mild and light workers. Therefore, it is of paramount importance to check the Dental Caries so that the problem can be nip at the bud, if not prevented at all.

This also means there is urgent requirement for all out health education and programme to be instituted from early infancy onward.

Addition of Fluorides, Plaque control programme, Diet Modificationto be carried out extensively. Whole person wellness coaching in Dental profession is likely to yield positive results.

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