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ORIGINAL RESEARCH

Prevalence of Dental Caries among Prisoners of Central Jail, Jodhpur City, Rajasthan, India

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ABSTRACT

Introduction: This study had twin objective first to determine the prevalence of dental caries and second to assess the correlation of duration of imprisonment, adverse habits and duration of adverse habits with dental caries status of prisoners in Central Jail, Jodhpur city, Rajasthan.

Materials and methods: This cross-sectional study was carried out on 131 male prisoners of Central Jail, Jodhpur city. A pre-designed questionnaire on general information, Tobacco consumption (frequency and duration of intake of Tobacco) and duration of imprisonment was used for the collection of data. The dental caries status was recorded using DMFT index (Henry T Klein, Knutson JW and Carole D Palmer; 1938).

Results: The total DMFT score was 180 and the average DMFT was 1.37 for the total prison population. A significant association was found between adverse habits and different age groups (χ^2 = 16.77, p = 0.033) and between duration of adverse habits and different age groups of prisoners (χ^2 = 16.58, p-value = 0.034). Significant correlation was found between adverse habit and duration of adverse habit ($p < 0.05$) in subjects having dental caries.

Conclusion: Though the prevalence of dental caries was so high, treatment for the same was not available due to lack of a dental unit in the jail. This highlights the urgent need of dental services in Central jail of Jodhpur city.

Keywords: Jail, Prison, Health, Caries.

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INTRODUCTION

A prisoner is a person legally committed to prison as a punishment for crimes committed or while awaiting trial.[1]

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There was a 73% increase in the number of prisoners over a short period of time and the rates of imprisonment are increasing dramatically in many countries around the world.[2]

There are 1336 prisons across our country out of which the central jails are 111 in number.[3] The total number of prisoners in central jails in the year 2012 was 313,282[2] as against the prescribed capacity of 117,242.[4] The figures indicate that the number of prisoners is more than double the prescribed capacity in jails of India. Overcrowding gives rise to the persistence of unhygienic conditions in the prison system which is a matter of great concern. It was found that the prisoners are more prone to wide range of health problems such as various infectious diseases, chronic illnesses, and mental illnesses, psychosocial and psychiatric problems due to the unhygienic conditions of jails. Mental illness, drug dependence and communicable diseases are the dominant health problems among prisoners.[5] Prisoners serving long-term or life sentences often experience the worse conditions of detention relative to other categories of prisoner. They suffer from extreme loneliness and so are prone to mental illnesses, psychosocial and psychiatric problems.[6]

To deliver health services in prisons becomes a challenging job for health personnels, as the prisoners can cause physical harm, even in the presence of security. Health personnels, especially dentists use sharp instruments in the basic screening and treatment procedures, which makes it difficult to assure security by the jail staff against any odds by the prisoners. As a result, medical and dental services in jails are meagre. Lack of provision of basic facilities, Health professional's reluctance to work in jails and negligence of health concern by the jail staff further deteriorates the health of prison inmates.[6]

Prison public health is becoming increasingly important to our society because the number of persons under the jurisdiction of correction systems, including those who are under trial, is increasing dramatically. In India, the provision of medical and dental facilities in prisons is very meagre and hence the oral health problems of prisoners have received little attention.[6]

The Jodhpur Central Jail provides the basic medical facilities to its prisoners through a team of doctors who are appointed by the prison system to work in the prison hospital

on daily basis; however, no oral health facility is available in its system. Keeping all the above points in view, a study was carried out aiming at assessment of the prevalence of dental caries among the prisoners of central jail, Jodhpur. This study had twin objective first to determine the prevalence of dental caries and second to assess the correlation of duration of imprisonment, adverse habits and duration of adverse habits with dental caries status of prisoners in Central Jail, Jodhpur city, Rajasthan.

MATERIALS AND METHODS

Methodology

A cross-sectional study was conducted in Central jail of Jodhpur city, Rajasthan, for a period of 2 days in the month of September 2012. Ethical approval was taken from the ethical committee of Vyas Dental College and Hospital. A written permission was taken from the central jail committee to carry out the examination and later informed consent was obtained.

Sampling

There were 525 prisoners in Jodhpur Central jail at the time of study. All the prisoners were informed 2 days prior regarding the camp. A total of 131 prison inmates were interested and came forward to participate in the screening examination.

Collection of Data

The study involved the completion of a pre-designed questionnaire on general information, Tobacco consumption (frequency and duration of intake of Tobacco) and duration of imprisonment. The prisoners were escorted in groups to the examination hall by 3 to 4 policemen for maintaining a strict security during the examination.

Each prisoner was interviewed followed by oral examination which was conducted by the examiner. The examiner carried out the examination and the data was recorded by a recorder. The Jail inmates were asked to sit comfortably on an ordinary chair with backrest in a well-illuminated and ventilated hall. The clinical examination was carried out using sterilized instruments (mouth mirror and explorer) by a single examiner. Autoclaved instruments were carried to examination hall. Later, cold method of sterilization of instruments was followed using activated gluteraldehyde solution –2.5% (cidex) for the 20 minutes.

The data was recorded by a recording clerk in predesigned proforma sheets and the dental caries status was recorded using DMFT index (Henry T Klein, Knutson JW and Carole D Palmer; 1938). After examination the prisoners were sent to their respective cells.

RESULTS

An epidemiological study was conducted to assess the prevalence of dental caries among the prisoners of central jail, Rajasthan, Jodhpur.

Table 1 shows the demographic characteristics of the prisoners. There were overall 131 prisoners, out of them 43 (32.8%) prisoners were in the age group of 19 to 28 years, and four (3%) prisoners were in the ≥68 years of age group. Forty-one prisoners were serving their term of more than 5 years and seven prisoners were serving their term of 25 to 36 months. The DMFT score was 0 for 49 prisoners and 11 for 1 prisoner.

Table 2 shows the distribution of DMFT among the prison population. The DMFT score for 29 to 38 years age group was 50 and a DMFT score of 8 was recorded for age groups 59 to 68 years and above 68 years. The average DMFT for 39 to 48 years age groups was 1.68 and for 59 to 68 years age groups was 0.8. The total DMFT score was 180 and the average DMFT was 1.37 for the total prison population.

Table 3 describes the status of missing teeth in the prison population. It was found that 25% of the subjects in the age groups of above 68 years had missing teeth and no subjects

Table 1: Demographics of the study population

Age groups (in years)	*N (%)*
19-28	43 (32.8)
29-38	38 (29)
39-48	22 (16.7)
49-58	14 (10.6)
59-68	10 (7.6)
>68	4 (3)
Total subjects	131
Duration of imprisonment (in months)	*N (%)*
<6	25 (19)
7-12	21 (16)
13-24	17 (12.9)
25-36	7 (5.3)
37-48	9 (6.8)
49-60	11 (8.3)
>60	41 (31.2)
DMFT score	*N (%)*
0	49 (37.4)
1	37 (28.2)
2	20 (15.2)
3	12 (9.1)
4	5 (3.8)
5	6 (4.5)
6	1 (0.7)
11	1 (0.7)

N(%): Number of study subjects (in percentage)

Table 2: Distribution of DMFT among different age groups of the prison inmates

Age groups in years (N)	*DMFT score*	*Average DMFT*
19-28 (43)	42	0.97
29-38 (38)	50	1.31
39-48 (22)	37	1.68
49-58 (14)	35	2.5
59-68 (10)	8	0.8
Above 68 (4)	8	2
Total (131)	180	1.37

Table 3: Number of subjects having missing teeth in different age groups

Age groups in years (N)	*Number of subjects having no missing teeth N (%)*	*Number of subjects having missing teeth N (%)*
19-28 (43)	41 (95.3)	2 (4.7)
29-38 (38)	38 (100)	0 (0)
39-48 (22)	18 (81.8)	4 (18.2)
49-58 (14)	11 (78.6)	3 (21.4)
59-68 (10)	10 (100)	0 (0)
Above 68 (4)	3 (75)	1 (25)
Total (131)	121 (92.4)	10 (7.6)

in the age groups of 29 to 38 years and 59 to 68 years had missing teeth. A total of 10 (7.6%) of the total subjects were having missing teeth.

Table 4 shows the number of prisoners having decayed, missing and filled teeth in the prison population. The number of prisoners having dental caries was 85 (64.9%). There were 80 (61.1%) prisoners having missing teeth and only 10 (7.7%) prisoners were having filled teeth. There were 83 (63.4%) prisoners who were having DMFT score.

Table 5 shows association between dental caries status and different age groups. Chi-square test was used to determine the association between dental caries status and different age groups of study subjects but no significant association was found between different age groups and dental caries status of study subjects ($\chi^2 = 6.59$, p-value = 0.252, NS).

Table 6 shows the association of adverse habits among different age groups of prisoners. It was observed that

Table 4: Status of decayed, missing and filled teeth in prisoners

Characteristics	*Number of prisoners N (%)*
Decayed teeth	85 (64.9)
Missing teeth	80 (61.1)
Filled teeth	10 (7.7)
DMFT score	83 (63.4)

N(%): Number of study subjects (in percentage)

35.7% of the prisoners in the age groups of 49 to 58 years were having the habit of tobacco smoking and 39.5% of the prisoners in the age groups of 29 to 38 years were having the habit of tobacco chewing. Also, it was observed that 13.6% of the prisoners in the age groups of 39 to 48 years had the habit of tobacco smoking and tobacco chewing. Chi-square test was used to determine the association between adverse habits and different age groups of prisoners and a significant association was found ($\chi^2 = 16.77$, p = 0.033).

Table 7 shows association of duration of adverse habits among different age groups of prisoners. Chi-square test was used to determine the association between duration of adverse habits and different age groups of prisoners and a significant association was found ($\chi^2 = 16.58$, p-value = 0.034).

Table 8 describes the association of adverse habits among prison inmates having dental caries. Chi-square test was used to determine the association between dental caries status and adverse habits among study subjects but no significant association was found between adverse habits and dental caries status of study subjects ($\chi^2 = 13.68$, p-value = 0.88, NS).

Table 9 describes the correlation between duration of imprisonment, adverse habits and duration of adverse habits among prisoners having dental caries. A significant correlation was found between adverse habit and duration of adverse habit ($p \leq 0.05$) in subjects having dental caries.

DISCUSSION

The results of this cross-sectional study on prisoners provide a unique opportunity to analyze the dental caries status in this left out population of society. There have been very few studies carried out on the oral health status of prisoners which indicates that the oral health status of prison inmates is poor and there is a special need of care for prison inmates.[6,7]

In the present study, prevalence of dental caries was 64.9% (*see* Table 4) among the total prison population. This may be a result of poor oral hygiene and negligence toward own oral health by the prisoners. This finding is in agreement with a study conducted by Veera Reddy et al,[6] who found that a total of 92.5% of prisoners in Karnataka

Table 5: Association of dental caries status among different age groups of prison inmates

Dental caries status	*Present N (%)*	*Absent N (%)*	*Chi-square*	*p-value*
Age groups in years (N)				
19-28 (43)	53.5 (23)	46.5 (20)		
29-38 (38)	65.8 (25)	34.2 (13)		
39-48 (22)	81.8 (18)	18.2 (4)		
49-58 (14)	71.4 (10)	28.6 (4)	6.59	0.252 (NS)
59-68 (10)	50 (5)	50 (5)		
Above 68 (4)	50 (2)	50 (2)		

p ≤ 0.05; CI: 95%; N(%): Number of study subjects (in percentage); NS: Not significant

Table 6: Association of adverse habits among different age groups of prison inmates

Adverse habits	*No habit N (%)*	*Tobacco smoking N (%)*	*Tobacco chewing N (%)*	*Tobacco smoking and chewing N (%)*	*Chi-square*	*p-value*
Age groups in years (N)						
19-28 (43)	44.2 (19)	18.6 (8)	30.2 (13)	7 (3)		
29-38 (38)	18.4 (7)	31.6 (12)	39.5 (15)	10.5 (4)		
39-48 (22)	31.8 (7)	22.7 (5)	31.8 (7)	13.6 (3)	16.77	0.03 (S)
49-58 (14)	28.6 (4)	35.7 (5)	21.4 (3)	14.3 (2)		
59-68 (10)	50 (5)	20 (2)	20 (2)	10 (1)		
Above 68 (4)	0 (0)	75.3 (3)	0 (0)	25 (1)		

p ≤ 0.05; CI: 95%; N(%): Number of study subjects (in percentage); S: Significant

Table 7: Association of duration of adverse habits among different age groups of prison inmates

Adverse habits	*No habit N% (N)*	*Less than 1 year N% (N)*	*From 5-10 years N% (N)*	*Chi-square*	*p-value*
Age groups in years (N)					
19-28 (43)	46.5 (20)	16.3 (7)	37.2 (16)		
29-38 (38)	21.1 (8)	31.6 (12)	47.4 (18)		
39-48 (22)	31.8 (7)	31.8 (7)	36.4 (8)	16.58	0.034 (S)
49-58 (14)	35.7 (5)	7.1 (1)	57.1 (8)		
59-68 (10)	60 (6)	0 (0)	40 (4)		
Above 68 (4)	0 (0)	50 (2)	50 (2)		

p ≤ 0.05; CI: 95%; N(%): Number of study subjects (in percentage); S: Significant

jails had one or more decayed (D) teeth. Around 32.8% of the total prisoners were in the 19 to 28 years age groups and 53.5% of the prisoners in this age groups were having dental caries. The average DMFT for the prison population was found to be 1.37. The highest average DMFT was found to be 2.5 for the age groups of 49 to 58 years. This result would have been probably due to the reason that tooth-loss due to poor periodontal conditions is commonly seen in this age group. Also, negligence of own oral health could have been a probable reason for the same. This result of the present study is in agreement with a study carried out by Osborn et al[8] who found that the 96% of prisoners in this age groups were affected by dental caries.

The consequence of delay in treating dental caries as well as lack of oral health services in the prison premises could be a reason for 61.1% of the prisoners having missing teeth (*see* Table 4). This finding is in agreement with the studies carried out by Veera Reddy et al[6] who found that 57.1% of the prisoners in Karnataka jails had one or more missing (M) teeth due to the lack of dental services.

It was observed that only 10 (7.7%) prison inmates had received the treatment for dental caries in the past. This was probably due to negligence of the prisoners toward own oral health and lack of dental services in jails. This result of the study was in agreement with the study carried out by Veera Reddy et al[6] who found that only 24.6% of the total prison

Table 8: Association of dental caries status with adverse habits among prison inmates

Adverse habit	*No habit N (%)*	*Tobacco smoking N (%)*	*Tobacco chewing N (%)*	*Tobacco smoking and chewing N (%)*	*Chi-square value*	*p-value*
DMFT score						
0	27.1	27.1	33.3	12.5		
1	35.1	24.3	27	13.5		
2	30	25	35	10		
3	33.3	25	33.3	8.3	13.68	0.883 (NS)
4	80	0	20	0		
5	33.3	50	16.7	0		
6	0	50	50	0		
11	0	100	0	0		

$p \leq 0.05$; CI: 95%; N(%): Number of study subjects (in percentage); NS: Not significant

Table 9: Correlation between duration of imprisonment, adverse habit and duration of adverse habit among prison inmates having dental caries

Characteristics	*Duration of imprisonment*	*Adverse habit*	*Duration of habit*
Duration of imprisonment	0	0.127	0.207
Adverse habit	0.127	0	0.678**
Duration of habit	0.201	0.678**	0

**Significant; $p \leq 0.05$; CI: 95%; N(%): Number of study subjects (in percentage)

population had one or more filled teeth and the inmates never visited the dentist due to lack of awareness in spite of part-time dental services in Karnataka jails.

The habit of tobacco was found in 81 (61.8%) of the prison inmates. This high number of tobacco users may be as a result of boredom, relief from stress, peer pressure and/or a combination of these issues. Use of tobacco and alcohol is prohibited in Indian jails, however, in the present study it was found that a large number of prisoners had the adverse habit of tobacco and they had an access for the same. This indicates that there was a loop-hole in the management of law by security personnels. These results are in agreement with the other studies conducted by Veera Reddy et al[6] who found that 42.8% of the prisoners in Karnataka jails had the adverse habit of tobacco. However, the result of present study was not in agreement with the study done by Dahiya and Croucher[9] who found that only 7.3 and 12.5% of the male prisoners had the adverse habit of tobacco chewing and smoking respectively. This may be a result of availability of healthy lifestyles, such as detoxification programs, smoking cessation and healthy food options in those jails which were not provided in the Jodhpur Central Jail. These motivational programs help the prisoners in getting rid of their depression and stress and thus encourage them to opt for healthy living.

A significant correlation was found between adverse habit and duration of adverse habit ($p \leq 0.05$) in subjects having dental caries. The prevalence of dental caries was found to be 64.9% and the habit of tobacco chewing was found in 61.8% of the prisoners. This result of the present study can be explained by the reasoning that high levels of fermentable sugars in chewing tobacco stimulate the growth of cariogenic bacteria and is a cause of concern for dental caries.

Negligence of prisoners own health , underestimation of jail authorities toward inmates ill health as well as lack of dental services for the prison inmates are explained similarly in other studies.[6,10-14] This highlights the need for a regular oral health treatment facility in the jail. According to Fiske et al,[15] the main barriers to the receipt of general dental services are well-recognized as cost, anxiety and access in prisons.

CONCLUSION

The present study was conducted among 131 prisoners in the central jail of Jodhpur, Rajasthan with the aim to assess the oral health status of jail inmates. It was observed that 64.9% of prison inmates had decayed teeth, 61.1% had missing teeth and only 7.7% of prison inmates had filled teeth. Though the prevalence of dental caries was so high, treatment for the same was not available due to lack of a dental unit in the jail. This highlights the urgent need of dental services in the Central Jail of Jodhpur city.

The habit of tobacco was found in 61.8% of the prison inmates. Also, a significant correlation was found in adverse habits and duration of adverse habits with dental caries status of the prisoners of Central Jail, Jodhpur city, Rajasthan.

In a developing country like India, the oral health problem of prisoners has always received little attention. This study emphasises the need for special attention from the Central and State governments and voluntary organizations to meet the oral health needs of this special group. The requirement of a dental unit could be made mandatory in the jail set-up so that the basic dental treatment can be rendered to the prisoners.

Efforts can be made to spread health education among the jail staff and as well as the prisoners about healthy life-style practices and the worst consequences of tobacco use. Further longitudinal studies should be conducted to explore the relationship between the onset and progression of dental diseases in the prison environment as the dental diseases are left unattended in the prison environment.

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