

Prevalence of Dental Caries in Rural India

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Introduction : India is the second highest populated country with more than 1030 million populations, out of which approximately 72% live in rural areas & remaining 28% in urban areas. It is of utmost importance that the rural population of India needs to be given a lot of attention in oral and dental health education programs in an effort to reduce the rural urban disparities in terms of health. In the developing countries such as India, changing life styles and dietary patterns are distinctly expanding caries incidence. There are very few studies where in most of the villages in rural India are covered and prevalence of dental caries is recorded. This study aims to provide a broader view as has covered most of the Indian villages, and thus provide a guide to the prevalence of dental caries in people of rural India.

Material & Methods : Informed consent was taken from the residents and the purpose of the camp was explained in the local language which they understood. All the diagnostics instruments were sterilized a day prior to the camp. The patients were made

comfortable on to the portable dental chair and were examined using mirror & probe. All the relevant findings were recorded in a pre-formed proforma and patients were explained regarding the same. Dental caries was recorded using the DMF index. At the end of the study all the data were analyzed and subjected to appropriate statistical analyses.

Results : During the survey, maximum prevalence of dental caries was recorded in states of Jammu-Kashmir and Himachal Pradesh (Mean = 6.14), Kerala (Mean = 5.10) and Haryana and Delhi (Mean = 4.11). Least prevalence of dental caries was recorded in Madhya Pradesh and Chhattisgarh (Mean = 0.88), and Orissa, West Bengal and Assam (Mean = 0.93).

Conclusion : Rural areas in India have less penetration of oral health experts. Each community health centre or public health centre in rural India must have an oral health professional to educate, guide and treat the rural population for better oral health.

Key Words : Dental Caries, Rural Indian Population.

INTRODUCTION

India is the second highest populated country with more than 1030 million populations, out of which approximately 72% live in rural areas & remaining 28% in urban areas.¹ The dentist to population ratio is 1:10000 in urban areas, whereas 1:150,000 in rural areas. There are several challenges being faced in delivery of oral health care to the rural population, such lack of man power & poor accessibility which is compounded by poverty & illiteracy.¹ Variations exist in oral health practices and the prevalence of oral diseases (periodontal diseases, treatment needs, and dental caries) in urban and rural areas. It is of utmost importance that the rural population of India needs to be given a lot of attention in oral and dental health education programs in an effort to reduce the rural urban disparities in terms of health.

The attainment of oral health which is an essential component of general health and well-being is impeded by multiplicity of barriers which include the cost, poor access due to workforce shortages, and inequitable distribution of the dental workforce, undue fear, anxiety and self-blaming, low oral health literacy and differing oral health beliefs, negative oral health attitudes, and poor oral health behaviours. Variations exist in oral health practices and the prevalence of oral diseases (periodontal diseases, treatment needs, and dental caries) in urban and rural areas.^{1,2,3} In developed countries, rural dwellers are more likely to have untreated dental caries than non-rural dwellers.^{1,4,5}

In the developing countries such as India, changing life styles and dietary patterns are distinctly expanding caries incidence.⁶ The prevalence of dental caries is found to be related to diet for ages.⁶ Dental caries because of its ubiquitous nature remains one of the most prevalent afflictions of mankind since the dawn of time. This disease can aptly be termed as a scourge of modern civilization and no nation or continent has escaped the ill effects of this deadly malady.

Dental caries not only causes damage to the tooth, but is also

responsible for several morbid conditions of the oral cavity and other systems of the body. The prevalence pattern of dental caries not only varies with age, sex, socio-economic status, race, geographical location, food habits and oral hygiene practices but also within the oral cavity.⁷ In developing countries, changes in living conditions due to urbanisation and adoption of western lifestyles are often considered as potential risk factors for the incidence of dental caries and recent population data show that the prevalence of dental caries is related to socioeconomic factors in developing countries as for developed countries.⁸ Geographical location plays a great role in caries prevalence, It varies with the change in location. According to National Oral Health Survey report 2004, caries prevalence in India was 51.9%, 53.8% and 63.1% at ages 5, 12 and 15 years respectively in different parts of India.⁹

Progression of decays to the surrounding tissue can cause inflammation and abscess formation which may subsequently act as a nidus for infection of other organs. Changes of diet and/ or oral hygiene habits in combination with optimal fluoridation may stop the progression of a lesion and even allow its remineralization. The onset of caries is characterized by only microscopically visible surface demineralization on dental hard tissues.¹⁰ During the last decade, dmf index has been the index of choice in the epidemiological surveys to assess the caries burden and restorative needs of various populations. There are very few studies where in most of the villages in rural India are covered and prevalence of dental caries is recorded. This study aims to provide a broader view as has covered most of the Indian villages, and thus provide a guide to the prevalence of dental caries in people of rural India. Through this study, efforts were made to introduce preventive measures as well as to educate the people by giving educational talks and describing the ill effects of caries on dental and general health. Through this study, it was tried to inculcate better oral hygiene habits in people residing in rural India which will

in-turn decrease the overall prevalence of dental caries and will improve their oral health.

MATERIAL & METHODS

After getting approval from the ethical committee of Pacific University in April 2015, the study was commenced in June 2015 and was completed in June 2016. The study was conducted in three phases and most of the rural India was covered. During the study a total of 55,000kms were covered in visiting the villages of India. The local village authorities were contacted for assistance and permission for conduction of a dental check up and oral hygiene awareness camp was obtained. After the required permission was sought arrangement for the camp was made, like distributing the forms, setting the timings of the camp. Informed consent was taken from the residents and the purpose of the camp was explained in the local language which they understood. All the diagnostics instruments were sterilized a day prior to the camp. The patients were made comfortable on to the portable dental chair and were examined using mirror & probe. All the relevant findings were recorded in a pre-formed porforma and patients were explained regarding the same. Dental caries was recorded using the DMF index.

$$\text{Average DMFT} = \frac{\text{Total DMF}}{\text{Total number of subjects examined}}$$

At the end of the study all the data were analyzed and subjected to appropriate statistical analyses.

RESULTS	State	DMFT Index			
		D	M	F	DMFT
Andhra Pradesh and Telangana	Mean	2.50	3.86	2.01	3.73
	N	448	333	169	735
	Std. Deviation	1.722	4.479	1.412	4.396
Bihar & Jharkhand	Mean	3.22	4.90	1.56	2.01
	N	55	20	9	144
	Std. Deviation	2.780	4.204	.882	3.638
Gujarat	Mean	2.52	3.12	2.13	3.62
	N	535	370	215	818
	Std. Deviation	2.283	2.650	3.050	3.536
Haryana and Delhi	Mean	2.67	3.07	2.55	4.11
	N	64	59	33	106
	Std. Deviation	2.912	2.703	4.367	3.892
Jammu-Kashmir and Himachal Pradesh	Mean	3.34	4.26	1.85	6.14
	N	338	330	234	484
	Std. Deviation	3.029	4.937	1.067	5.804
Karnataka	Mean	2.50	3.05	2.18	3.16
	N	380	237	152	634
	Std. Deviation	2.123	2.558	2.982	3.384
Kerala	Mean	3.27	4.75	2.34	5.10
	N	48	36	32	79
	Std. Deviation	2.190	7.137	1.599	6.020
Maharashtra and Goa	Mean	2.24	2.69	2.40	2.43
	N	66	32	10	106
	Std. Deviation	1.447	2.320	1.776	2.938
Madhya Pradesh and Chattisgadh	Mean	2.12	1.00	8.00	.88
	N	34	4	2	104
	Std. Deviation	1.200	.000	.000	1.560
Orissa, West Bengal and Assam	Mean	1.86	4.45	2.17	.93
	N	73	12	7	213
	Std. Deviation	.952	3.110	1.169	1.807
Punjab	Mean	2.47	3.87	1.93	3.87
	N	476	372	203	776
	Std. Deviation	1.751	4.308	1.305	4.354
Rajasthan	Mean	2.32	2.78	2.08	3.02
	N	336	182	106	498
	Std. Deviation	1.523	2.288	1.307	3.036
Tamilnadu	Mean	2.22	2.45	2.18	4.04
	N	37	29	17	47
	Std. Deviation	1.294	2.164	2.157	3.043
Uttar Pradesh & Uttaranchal	Mean	2.50	3.05	2.31	3.33
	N	3039	2134	1250	5006
	Std. Deviation	2.127	3.821	2.198	4.138

Table 1- State wise distribution of DMFT index of cases

Table 1 shows that during the present survey, maximum prevalence of dental caries was recorded in states of Jammu-Kashmir and Himachal Pradesh (Mean = 6.14), Kerala (Mean = 5.10) and Haryana and Delhi (Mean = 4.11). Least prevalence of dental caries was recorded in Madhya Pradesh and Chhattisgadh (Mean = 0.88), and Orissa, West Bengal and Assam (Mean = 0.93).

DISCUSSION

Dental caries is considered as the most prevalent infectious disease affecting the human race. This irreversible microbial disease affecting calcified tissues of teeth has existed since before the period of civilization. In the developing countries like India, changing life-styles and dietary patterns are distinctly expanding the prevalence of Dental caries. The incidence and pattern of dental caries vary with age, sex, socioeconomic status, race, geographic location, food habits, genetic make-up and oral hygiene practice etc. several studies regarding caries prevalence have been conducted in different parts of India. This is perhaps the first study undertaken to assess the prevalence of dental caries across the nation using the DMFT index.

During the present study, virtually no region of India was recorded completely free from dental caries. Average prevalence of dental caries in rural population of India was recorded as 3.58 teeth/person. Maximum prevalence of dental caries was recorded in states of Jammu-Kashmir and Himachal Pradesh with mean number of carious tooth in studied population as 6.14. Kerala stood second in the frequency of caries with mean count as 5.10. Least prevalence was recorded in Madhya Pradesh Chhattisgadh (Mean = 0.88) and Orissa, West Bengal and Assam (Mean = 0.93). Among this, persons showing maximum number of decayed (but not treated) teeth were observed in Jammu-Kashmir and Himachal Pradesh. This result has pointed at two possibilities; one that the rural population is uneducated and unaware about the methods of oral hygiene maintenance and relationship between dietary habits and occurrence of dental caries. Second is the people in villages are negligent for the treatment of carious teeth, hence they are negligent about oral health. Another possibility is that, Jammu-Kashmir and Himachal Pradesh are states with villages on extremely high altitude, which are away from the facilities of modern dentistry. Thus, they may not approach hospitals in the urban areas where they can get the treatment of decayed teeth.

In the population showing missing teeth due to dental caries, Bihar and Jharkhand showed maximum frequency with mean number of missing teeth as 4.90. This shows the unawareness of people about the importance of salvage of natural dentition. These are the states where perhaps large numbers of people are indulging into unethical and uncertified dental practice or quackery. People of rural India must be educated and made aware about the fact that various treatment modalities are available to save decayed teeth. They can be motivated to save the natural teeth by restorative, endodontic and periodontal treatments. More numbers of rural oral health care centres are definitely needed in villages to upgrade the oral health of rural public.

Madhya Pradesh and Chattisgadh rank first in mean number of filled or restored teeth per person (mean = 8). This shows the awareness of rural public in these areas regarding saving the natural teeth by treatment of dental caries. At the same this also

indicates a high rate of dental caries in these rural areas.

CONCLUSION

Prevalence of dental caries in each case was determined by carrying out DMFT (Decayed Missing Filled Tooth) index. This showed a considerable prevalence of dental caries in various Indian states. This result suggested a need for education about prevention of dental caries in rural areas. From the present study we found that maximum prevalence of dental caries was recorded in Jammu-Kashmir, Himachal Pradesh, Kerala, Haryana and Delhi.

The current survey suggested that oral hygiene habits, oral health awareness and knowledge level among rural public needs to be improved. Village population should be informed and motivated about right methods of oral hygiene maintenance, diet and dental caries. Rural areas in India have less penetration of oral health experts. Each community health centre or public health centre in rural India must have an oral health professional to educate, guide and treat the rural population for better oral health. The data obtained in this survey can be helpful for designing the preventive measures against dental caries which will help to significantly reduce the prevalence of the same in rural population of India.

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