Agewise Oral Health Status Of Aurangabad District

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Abstract

Introduction

Oral health is a very important component of general health and is indispensable for the wellbeing and good quality of life. Poor oral health affects growth negatively in all aspects of human development. Awareness about oral health amongst the Indian Population has increased over the years but at snail's Pace.

Some of the common oral diseases are dental caries, periodontal diseases, malocclusion, sub-mucosal fibrosis, oral cancer etc. Most of them like dental caries, periodontitis are preventable in nature if proper oral hygiene is maintained. Moreover mortality of many teeth can be prevented or delayed by routine dental check up and early intervention for the diseases.
With this background the study was planned to assesss the agewise oral health status of Aurangabad district of Marathwada region.

Materials and Methods

It was a community based, prevalence study carried out in field practice area of Rural Health And Training Center, Paithan. Aurangabad District was chosen for the study because it is a capital place of Marathwada region. Sample selection was done using Pathfinder methodology from Urban I, Urban III and Rural areas. Five index age groups were included: 5-6 yrs, 12 yrs, 15-18 yrs, 35-44 yrs and above 65yrs and total sample size of 2400 was selected.

The standard proforma was designed for Malocclusion, Community Periodontal Index and Treatment Needs (CPITN), Dentition Status, Dental Caries, Number of Teeth, Need for Dentures, Opacities and Enamel Disorders, And Treatment Needs according to WHO Oral Health Assessment Form.

All the findings were recorded in the data sheet after thorough examination.

Statistical analysis: The data of respondents was collected and compiled. Prevalences were calculated. The proportions were compared using Chisquare test and the level of significance was set at P<0.05.

Results: In the present study severe malocclusion was more common in 12 years age group. Whereas slight malocclusion was more prevalent 18 and 35-44 years age groups. Prevalence of dental caries and periodontal disease increases with age and subsequently number of teeth decreases in later ages of life. Of the total subject, 1.20% of people showed hypoplasia and 16.87% of people showed attrition.

Conclusion: Epidemiological data on any disease serve very useful purpose - it helps in understanding the prevalence of disease in a given community, age and gender preference/bias, various causative/ modifying factors, and finally in strategic planning to curtail and prevent the diseases. On similar grounds our institute has conducted the study which would be beneficial for planning further preventive strategies and treatment modalities.

Keywords: Oral Health, Periodontal disease, prevalence, Community Periodontal Index, Malocclusion, Dental Caries

Introduction

Smile and the world smiles with you and what is it that makes a smile so beautiful ? It is our oral cavity. But how unfortunate that the human population hardly spare a thought for care of oral health. Awareness about oral health amongst the Indian Population has increased over the years but at snail's Pace.

Oral health is a very important component of general health and is indispensable for the wellbeing and good quality of life. Poor oral health affects growth negatively in all aspects of human development. It has a profound effect on systemic health. There is an increased risk of

infective endocarditis, digestive problems in senior citizens, cardiovascular disease, stroke and bacterial pneumonia, preterm delivery in patients with poor oral health.[1]

The burdon of oral diseases parallels that of other non-communicable diseases like diabetes, hypertension, other cardiovascular diseases and cancer, both in terms of complications and cost of treatment if not attended to at early stages.[2]

Oral diseases affect both the young and the old. Some of the common diseases are dental caries, periodontal diseases, malocclusion, sub-mucosal fibrosis, oral cancer etc. Cleft lip and cleft palate also continue to affect the population. Most of the common oral diseases like dental caries, periodontitis are preventable in nature if proper oral hygiene is maintained.[3] Moreover mortality of many teeth can be prevented or delayed by routine dental check up and early intervention for the diseases.[4]

With this background the study was planned to assesss the agewise oral health status of Aurangabad district of Marathwada region.

Materials and Methods

Study design: It was a community focused, prevalence study.

Study area: Field practice area of Rural Health And Training Center, Paithan of Govt. Medical College, Aurangabad, Maharashtra, India.

Study period: 1st June 1993 to 31st March 1994.

Study population: Aurangabad District was chosen for the study because it is a capital place of Marathwada region. Sample selection was done using Pathfinder methodology. For urban population, 4 sites from Aurangabad city; for Urban III/Semi-urban population, 2 sites from Paithan and 2 sites from Kannad and for rural population 4 villages from Aurangabad city i.e. Phulambri, Kachner, Adul and Hathnoor were selected.

Five index age groups were included: 5-6 yrs, 12 yrs, 15-18 yrs, 35-44 yrs and above 65yrs. As per the standards of pathfinder methodology, there should be the minimum 20 subjects in each cluster. Male: Female ratio was tried to be kept as 1:1. Applying this sampling distribution to the entire population the total sample size of 2400 was selected.

Study tool: All subjects were examined under proper illumination, on simple bed, table or chair.

Following instruments were used for the examination:

1. Mouth Mirror.

2. Caries Explorers.

3. Periodontal Probe.

4. Concentrated sterilized solution.

The standard pro-forma was designed for oral health status according to WHO Oral Health Assessment Form (3rd Ed) and pretested on 40 subjects as a pilot trial and continued on entire subjects for data collection. Assessment was done for following factors:

1] **Periodontal Disease**

CPITN Index (Community Periodontal Index and Treatment Needs) was used for assessment. Following codes were used:

0 – Healthy.

1 – Bleeding observed, directly or by using mouth mirror, after sensing.

2 – Calculus felt during probing.

3 – Pocket 4 or 5 mm.

4 – Pocket > 6 mm.

R – Recession – Exposure of tooth by the apical migration of gingiva is called gingival recession or atrophy.

2] **Malocclusion**

The following codes were used:

0 – No anomaly or malocclusion

1 – Slight anomalies, such as one or more rotated or tilted teeth or slight crowding or spacing, which disturb the regular alignment of the teeth

2 – More serious anomalies, specifically the presence of one or more of the following conditions of the four anterior incisors:

- Maxillary overjet estimated to be 9 mm or more

- Mandibular overjet, anterior cross bite equal to or greater than a full tooth depth

- Open bite

- Midline shift estimated to be more than 4 mm and

- Crowding or spacing estimated to be more than 4 mm

3] **Dentition Status**

Primary teeth were noted with alphabetical and permanent teeth with numericals.

Dentition status was evaluated as follows:

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Dentition Status	Treatment Needs
0 – sound tooth	0 – none
1 – decayed	1 – caries arresting or sealant care
2 – filled and decayed	2 – one surface filling
3 – filled, no decay	3 – two or more surface fillings
4 – missing due to caries	4 – crown or bridge abutment
5 – missing due to any other reason	5 – bridge element
6 – sealant, varnish	6 – pulp care
7 – bridge abutment or special crown	7 – extraction
8 – unerupted tooth	8 – need for other care
9 – excluded tooth	9 - specify

Based on the above table following parameters were evaluated:

4] Assessment of dental Caries

5] Assessment of Denture Needs

5] Assessment of Opacities And Enamel Disorders

6] Treatment Needs

All the findings were recorded in the data sheet after thorough examination.

Statistical analysis: The data of respondents was collected and compiled. Prevalences were calculated. The proportions were compared using Chisquare test with and without Yate's correction and the level of significance was set at $P<0.05$.

Results:

Table 1: Profile of Index Age Group with Gender in study population

Sr. No.	Socio-demographic profile	Urban	Urban III	Rural	Total
1	**Gender**				
	Male	400(33.33)	400(33.33)	400(33.33)	1200(100)
	Female	400(33.33)	400(33.33)	400(33.33)	1200(100)
	Total	800(33.33)	800(33.33)	800(33.33)	2400(100)
2	**Index Age Group**				
	5-6	160(33.33)	160(33.33)	160(33.33)	480(100)
	12	160(33.33)	160(33.33)	160(33.33)	480(100)
	15-18	160(33.33)	160(33.33)	160(33.33)	480(100)
	35-44	160(33.33)	160(33.33)	160(33.33)	480(100)
	65+	160(33.33)	160(33.33)	160(33.33)	480(100)
	Total	800(33.33)	800(33.33)	800(33.33)	2400(100)

From Table 1 it is clear that the 2400 study population was divided equally into 3 regional groups i.e. Urban I, Urban III and Rural (800 each). Five index age groups were divided eually with male to female ratio of 1:1

Table 2 :- Association between Geographic location and Dentition Status with Index Age Group/ Mean DMF in study population

	Index Age Group in Yr.				
Geographic location	**5-6**	**12**	**18**	**34-44**	**65+**
Urban I	2.0875	1.3062	1.3312	2.4312	12.65
Urban II	2.268	1.4125	1.4062	2.2812	12.025
Rural	1.375	1.3312	1.7187	3.7	12.3
Total	5.7305	4.0499	4.4561	8.4124	36.975
Mean DMF	**1.910167**	**1.349967**	**1.485367**	**2.804133**	**12.325**

Table 2 shows Mean DMF (Decayed, Missing And Filled) status of the agewise groups in 3 geographic locations. Mean DMF was found be highest in 65+ age group i.e. 12.325 with highest prevalence in Urban I (12.65) whereas it was found to be lowest in 12 years of age group i.e. 1.349 with lowest prevalence in Urban I (1.306).

Table 3: Age and Gender wise Oral Health Status in study population

SR. NO.	Oral Health Status		Index Age Group in Yr.						P Value
1	mal-occlusion	Gender	05-06	12	18	35-44	65+	Total	P Value
	0	Male	123 (51.25)	94 (39.17)	93 (38.75)	105 (43.75)	148 (61.67)	563 (46.92)	X2 = 148.476 $p < 0.05.$
		Female	117 (48.75)	62 (25.83)	99 (41.25)	95 (39.58)	130 (54.17)	503 (41.92)	
	1	Male	96 (40)	95 (39.58)	130 (54.17)	129 (53.75)	77 (32.08)	527 (43.92)	
		Female	89 (37.08)	128 (53.33)	120 (50)	112 (46.67)	87 (36.25)	536 (44.67)	
	2	Male	21 (8.75)	51 (21.25)	17 (7.085)	6 (2.5)	15 (6.25)	110 (9.17)	
		Female	34 (14.17)	50 (20.83)	21 (8.75)	33 (13.75)	23 (9.58)	161 (13.42)	
	Total	Male	240 (100)	240 (100)	240 (100)	240 (100)	240 (100)	1200 (100)	
		Female	240 (100)	240 (100)	240 (100)	240 (100)	240 (100)	1200 (100)	
2	DENTITION STATUS								
	0	Male	98 (40.83)	112 (46.66)	127 (52.91)	75 (31.2)	26 (10.83)	438 (36.5)	X2 = 199.2377 $p < 0.05.$
		Female	105 (43.75)	118 (49.17)	112 (46.66)	77 (32.08)	33 (13.75)	445 (37.08)	
	1	Male	142 (59.16)	128 (53.33)	113 (47.08)	165 (68.75)	214 (89.16)	762 (63.5)	

		Female	135 (56.25)	122 (50.83)	128 (53.33)	163 (67.91)	207 (86.25)	755 (62.91)	
	Total	**Male**	240 (100)	240 (100)	240 (100)	240 (100)	240 (100)	1200 (100)	
		Female	240 (100)	240 (100)	240 (100)	240 (100)	240 (100)	1200 (100)	
3	**DT + MT + FT**	**Male**	508 (55.39)	312 (48.14)	347 (48.66)	678 (50.37)	2701 (45.64)	4546 (47.64)	X2 = 35.9315 $p < 0.05.$
		Female	409 (44.60)	336 (51.85)	366 (51.33)	668 (49.62)	3216 (54.35)	4995 (52.35)	
	Total		917 (100)	648 (100)	713 (100)	1346 (100)	5917 (100)	9541 (100)	
4	**DMF**	**Male**	2.116	1.3	1.445	2.825	11.25	3.7872	
		Female	1.704	1.4	1.525	2.783	13.4	4.1624	
5	**Mean DMF**		1.91	1.35	1.485	2.804	3.9748	12.325	
6	**PERIDONTAL STATUS**								
	0,		158 (32.91)	112 (23.333)	51 (10.62)	25 (5.20)	11 (2.29)	357 (14.87)	X2 = 1873.357. $p < 0.001.$
	1,2		322 (67.08)	368 (76.66)	207 (43.12)	140 (29.16)	35 (7.29)	1072 (44.66)	
	2,3,4		0 (0)	0 (0)	216 (45)	268 (55.83)	163 (33.95)	647 (26.95)	
	2,3,4,R		0 (0)	0 (0)	6 (1.25)	47 (9.79)	271 (56.45)	324 (13.5)	
	Total		480 (100)	480 (100)	480 (100)	480 (100)	480 (100)	2400 (100)	
7	**NO of Teeth Present**								
	>=28 Teeth					468			
	<28 Teeth					12			
	>= 20 Teeth						474	309	783	X2 = 188.711

	<20 Teeth					4	79	83	*p* < 0.05.
	Edentulous	**0**	0	0	0	2	92	94	
	TOTAL				480	480	480	1440	
8	**Mean No. Teeth**		22	26	29	31	20		

Table 3 shows that severe malocclusion was more common in 12 years age group (males)(21.25) whereas mild malocclusion was more common in 18 years age group (males)(54.17) and 35-44 years age group (53.75). Dental Caries was more prevalent in 65+ age group (89.16%) with slight more predilection in males. DMFT score was significantly more in females than in males whereas DMF score was more in males than in females. Mean DMF was found to be highest in 65+ age group (3.974). Mild Periodontal Disease was found more prevalent in 12 years age group (76.66%) wheras severe periodontitis was more common in 65+ age group (56.45%). Considering number of teeth present, at the age of 18; out of 480, 468 subjects were having more than 28 teeth and 12 <28 teeth. At the age of 35-44, out of 480, 474 were having >20 teeth and 4 <20 teeth And at the age 65+, out of 480, 309 were having >20 teeth and 79 <20 teeth. 2 individuals were completely edentulous in 35-44 age group and 92 in above 65 age group.

Table No 4: Assessment Based Dentures Needs

Assessment based Dentures Needs				
	Need for Dentures	**Wearing Denture**	**Total**	**P Value**
Not Required Dentures	1841	0	1841	$X2 =$ 139.413.
Partial Dentures	360	3	363	
Full Dentures	181	15	196	$p < 0.001.$
Total	2382	18	2400	

Table 4 shows that out of 363 individuals only 3 were using partial denture and 360 were in need of it whereas out of 196 complete edentulous subjects only 15 were using complete denture and 181 were in need of it.

Table No. 5: Assessment of Opacities & Enamel Disorders

Assessment of Opacities & Enamel Disorders	NO . Of Subject	Percentage
0 – Normal	1955	81.458
1 – Opacity	0	0
2 – hypoplasia	29	1.208
3 – Tetra cycling Stain	0	0

4- Mutilation	0	0
5- Attrition	405	16.875
2,5 - - hypoplasia+ Attrition	11	0.458
Total	2400	100

Table 5 shows enamel hypoplasia was seen in 1.208% of subjects whereas attrition was found in 16.875% of subjects. 0.458% revealed hypoplasia with attrition.

Table No 6: Distribution of subject as per Treatment Need

Treatment used	No of Subject	Percentage
0- NO Treatment	883	36.792
1 - Caries Arresting or Sealant Care	23	0.958
2 - One surface filling	921	38.375
3- Two or More Surface filling	109	4.542
4- Crown or Bridge abutment	4	0.167
6 - Pulp Care	26	1.083
7 – Extraction	434	18.083
Total	2400	100
No. of Teeth for Restoration	2774	1.156*
No. of Teeth for Extraction	1879	0.783*
* Mean No. of teeth for restoration and Extraction		

Table 7 shows that 36.792% cases were not requiring any treatment, 0.958 had arrested caries requiring sealant care, one surface filling in 38.375% subjects, crown and bridge abutment in 0.167% subjects, pulp care in 1.083% subjects, and extraction in 18.083 % subjects.

Discussion

Oral health is an integral part of general health. Oral health status has a direct impact on general health and conversely, general health influences oral health. Poor oral health affects growth negatively in all aspects of human development. Though oral and dental diseases are rarely life threatening, they have a deep impact on the quality of life. Dental diseases are expensive to treat but simple to prevent. Considering these facts, the present study was planned to determine the oral health status of population in Aurangabad district.

Data findings of the present study revealed that malocclusion was more common in 12 and 18 years of age group. To be specific, severe malocclusion was more common in 12 years age group

males (21.25%). Whereas slight malocclusion was more prevalent in males of 18 years (54.17) and 35-44 year age groups (53.75%). Prasad and Savadi (1970-80) reported highest prevalence of mal-occlusion was 85.7% among females of 13 years, and 66% among the boys of 15 years.[5] Korkhaus G and Madden I also revealed maximum prevalence of mal-occlusion in 12-15 years of age group with slight more predilection in males.[6,7]

In the age group 5-6 years percentage of caries free population was 40.83% in males and 43.75% in females. Lower percentages of caries free population in this age group than 12-18 years is because it is the age where primary dentition is likely to be present and only first permanent molars and permanent lower central incisors may have erupted. The duration of teeth being present in the oral cavity is low in this age group. From the present data, it was clear that as age increases percentage of dental caries in the population increases. Prevalence of dental caries was found to be maximum in 65+ years of age group. Mean DMF at age 12 was 1.35 whereas at 18 years it was 1.485. DMF at 34-44 age group was 2.804 and at 65+ it was 12.327. DMF at age group 5-6 years was found to be higher 1.9105 than age group 12 and 18 years. Mean DMF was found to be higher in females 4.162% than in males 3.788. Gaikwad and Indurkar found that percentage of caries at different age was as 5-6 years 47.8%, at 7-8 57.7%, 9-10 years 59.3%; 11-12 years 43.5%, 13-14 years 53.9% and the overall prevalence of caries was 51.12%.[8] Study of prevalence of dental caries in urban area of Nagpur showed that prevalence of dental caries was highest in age group of 12 years 83.33% and at 18 years 79.29%.[9] Mann et al observed the prevalence and pattern of caries in Jerusalem (Israel) in 1986 and they found that out of 414 individuals, males had 9.59 DMFS and females had 13.21 DMFS (female show high DMFS) Distribution of DMFs with age wise distribution showed that at age 12-13 years, DMFS was 8.46, at age 14-15 DMFs was 10.99, at 16-17 DMFs was 14.39 and overall DFMs was 11.25.[10] They also found increase in DFMs with increase in age.

Considering the periodontal status, healthy periodontium was seen in 5-6 years of age group. Prevalence of periodontitis was found be highest in a 65+ years age group i.e. 56.45 %. It was seen that as age increases, severity of periodontal disease increases. Sachdev et al shown, gingival and periodontal disease increases with age.[11] In their study, they have shown prevalence of periodontal disease in 3-10 years 34% and 11-20 years 82%.[11] In all surveys where prevalence and severity have been assessed, periodontal disease have been found to increase throughout life.[12,13] High prevalence of gingivitis has been observed in both primary and permanent

dentition of children, from 13 years and above the proportion of persons with periodontal pocket and alveolar bone loss increases. The prevalence of destructive diseases, follows a linear progression from adolescence to old age.[14] Strong correlation with age, probably reflects the cummulative effect of the disease rather than the diminishing resistance of older people. D'Silva et al and Amid et al also had similar findings in their studies.[15,16]

Distribution of subjects with mean no. of teeth present in mouth was at age group 5-6 years 22, at 12 years 26, at 18 years 29, at 35-44 years 31, at 65+ years 20. From this it is clear that, at age 65+, sharp loss of teeth is very high.

Distribution of subject as per retaining their teeth showed that, at age 18 years, 97.5% of people retain their all teeth, 2.5% people did not retain their all teeth in their mouth. Of the total 18 years studied population, 97.5% retained their all teeth which is above the WHO goal[17,18] of 85% to retain all their teeth.

Form the above data, it is clear that at age group 35-44 years 1.25% of people had <20 teeth and 98.75% of people had >20 teeth. At age group 65+ 35.625% of people had <20 teeth and 64.375% of people had >20 teeth in their mouth. WHO goal after 2000 AD[17,18] –

Age 35-44 : 75% with 20 teeth

Age 65+ : 50% with 20 teeth

Of the total 35-44 years and 65+ years studied population 98.75% and 64.37% of population had more than or equal to 20 teeth respectively which is above the WHO goal.

Considering the denture needs of the population, out of total 2400 subjects, 1841 were not required dentures. Out of 363 partially edentulous individuals only 3 of them were wearing partial denture whereas 360 subjects were having the need of partial denture. Out of 196 completely edentulous individuals, only 15 were wearing complete denture whereas 181 were in need of it. At age group 35-44 years, percentage of population needing dentures found in Ireland was 4%, England And Wales 3%, Scotland 7%, Netherlands 9%, Sweden 2% and USA 3%.[18]

Distribution of subject as per opacities and other enamel disorder, showed that 81.45% of people did not show any enamel disorder or opacities. Of the total subject, 1.20% of people showed hypoplasia, 16.87% of people showed attrition and 0.46% of people showed hypoplasia along with attrition of teeth. No persons were found in the study with opacities, tetracycline stain and mutilation.

Distribution of subject as per treatment need shown that – 36.79% of population does not require any treatment for their dentition status. 0.96% of population requires caries arresting and sealant care treatment. 38.73% of population requires one surface filling treatment. 4.54% of people require two surface filling treatments. 0.17% of people requires crown or bridge abutment. 1.08% of people require treatment for pulp care. 18.08% of people require extraction (total as well as some tooth extraction) treatment. Total no. of teeth needing restoration care were 2774, whereas mean no of teeth requiring restoration was 1.155. Total no. of teeth for extraction were 1879 with mean no. of teeth needing extraction is 0.7823. Study of prevalence of dental caries in an urban area of Nagpur showed that, in the age group 12 years, the no. of teeth requiring one surface restoration was maximum 68.89% but in age group 16, 17 and 18 years, the percentage of teeth needing one surface was reduced to 28.14%, 30.23% and 32.30% respectively.[9] With advancing age, teeth requiring 2 surface restorations were more than one surface restoration and it was 13.90% at 12 years, 32.98% for 13 years and 47.98% for 18 years. No. of teeth requiring extractions treatment was as 3.29% for 12, 7.66% for 15, 8.09% for 16 and 6.85% for 18 years.[9]

Varenne B et al and Carter G also assessed treatment need in different subjects and had some findings consistent with present study findings.[19,20]

Conclusion

The high prevalence of dental diseases, like dental caries, periodontal disease, various forms of malocclusion, and lack of access to the required services leads to significant absenteeism and economic loss, apart from the ill-effects on the health of the person afflicted. For this purpose, and other planning and administrative needs, it is necessary to know the prevalence and distribution of oral health problems and understand the dental health practices that people follow. Epidemiological data on any disease serve very useful purpose - it helps in understanding the prevalence of disease in a given community, age and gender preference/bias, various causative/ modifying factors, and finally in strategic planning to curtail and prevent the diseases. WHO recommends that oral health survey be conducted regularly at 5 years interval to understand the effectiveness of oral health care service being provided and modifications, if any that need to be made. National Oral Health Survey & Fluoride Mapping by Dental Council of India was conducted in 2003.[21] On similar grounds our institute has conducted the study which would be beneficial for planning further preventive strategies and treatment modalities.

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