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Patient load and spectrum of dental problems amongst the population attending outpatient services of a tertiary care medical college hospital, Arunachal Pradesh

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ABSTRACT

Background: Evidences suggest relationship between periodontitis and systemic diseases such as cardiovascular diseases, diabetes mellitus, adverse pregnancy outcome, osteoporosis and chronic kidney diseases. Except for acute toothache and complicated local infection, other dental problems are often considered trivial, hence dental health is often neglected or omitted in health related discourses. **Aims and Objectives:** (1) To assess the patient load in dental OPD compared to other outpatient departments and (2) examine the distribution of dental diseases among different age, gender and caste of dental patients in a tertiary care hospital over a 5 year period. **Materials and Methods:** A hospital based retrospective study was conducted using data from Medical Record department of all OPD attendees (1,174,605) during the period from January 2016 to December 2020 in the tertiary care hospital of Arunachal Pradesh. The total number of dental OPD patients (57,198) was compared with the total and department wise OPD attendees during the same period. Out of all Dental patients , data of 11,225 were found to be complet (cross checked MRD record with OPD register) hence analysed for distribution of disease as per age/ sex/ ethnicity . Results: Emergency and Casualty department reported highest patient load, lowest in cardiology. Overall dental patient OPD load was highest in 2019 and lowest in 2020. Common dental problems were caries and its complications, root stamp/retained tooth, dental calculus, stain, and trauma related dental problems. Most of the trauma related cases were males, whereas other conditions like dental caries, root stamp, complication of caries, and dental calculus/stain were more common in females. **Conclusion:** Data shows that the number of dental patients among all OPD attendees is high and the dental problems they present with are diverse in nature. The treatment provisions available in most health care centres are largely inadequate. Inclusion of Oral and Dental health in Planning of community health programs, sensitisation of all health care providers the importance of interdepartmental consultation with dental department and education of the masses in oral and dental care/hygiene are of paramount importance.

Keywords: Dental problems; Patient load; Disease spectrum; Retrospective data analysis; Arunachal Pradesh

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INTRODUCTION

The oral cavity plays a critical role in numerous physiologic processes including digestion, respiration, and speech. The WHO declares that deprived oral health and its diseases may have dreadful effect on the common health as well as eminence of life.[1]

There is well-established evidence that suggests a bidirectional relationship between periodontitis and systemic diseases.[2]

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Studies suggest association between periodontal diseases and systemic conditions such as cardiovascular diseases, Type-2 diabetes mellitus, adverse pregnancy outcome, osteoporosis, and chronic kidney diseases.[3]

Periodontal diseases are prevalent both in developed and developing countries and affect about 20–50% of global population.[4] High prevalence of periodontal disease in adolescents, adults, and older individuals makes it a public health concern.[4]

Oral diseases and a number of other non-communicable diseases share some common risk factors (e.g., tobacco use and poor diet) and similar pathophysiologic mechanisms (e.g., infection and chronic inflammation response).[5] With "epidemiological transition," non-communicable diseases, including oral diseases, continue to rise and likely to contribute oral disorders to the global total (disability-adjusted life years) burden.

Dental caries (also known as tooth decay or dental cavities) is the most common non-communicable disease worldwide.[6] Its prevalence and severity vary with age, sex, socioeconomic status, geographical location, food practice, and oral hygiene.

The toothache, difficulty in eating, chewing, smiling, and speaking due to missed, discolored teeth, has a great impact on people's life including but not limited to low self-esteem. In spite of the overwhelming evidence that dental health plays a great role in the health of people, dental/oral problems are seldom considered as important health problems in the society. Still the importance of this is often ignored in health surveys and community-oriented health programs.

Aims and objectives

To assess: (i) Overall dental patient load as compared to all outpatient departments (OPDs) and (ii) prevalence of dental problems among different age, sex, and caste among the registered patients of Tomo Riba Institute of Health and Medical Sciences (TRIHMS), Arunachal Pradesh, from January 2016 to April 2021.

MATERIALS AND METHODS

An observational, hospital-based, retrospective study was conducted in TRIHMS Hospital, Arunachal Pradesh, India, over a period of 5 years from January 2016 to December 2020. Data of patients attending all OPDs of TRIHMS during that period were collected from medical record department (MRD) database. Out of 57,198 dental patients, only 11,225 patients, whose data were found to be complete, were eligible for detail analysis of dental diseases, age/sex/ethnic distribution. The accuracy of the data of each of the 11,225 cases was cross-checked with the entries in the resisters maintained in the dental OPD.

The dental conditions were classified according to ICD-10 (International Classification of Diseases). The selected 11,225 patients were categorized according to age, sex, caste, and type of dental/oral problems as diagnosed by dentist. To calculate the burden of dental patients, the total number of dental patients was compared to patients visiting all OPDs during the same period.

Data were entered and analyzed using MS-EXCEL. To analyze the data, simple statistical tools such as diagram, table, and percentage were employed.

RESULTS

A total of 1,174,605 patients were recorded in 17OPDs of TRIHMS during the study period. Department-wise distribution of patients (Table1) shows that casualty department reported highest patient load (15.06%), next general medicine (12.28%), followed by obstetrics and gynecology (10.98%), skin (9.34%), and general surgery (7.91%) whereas the lowest number was reported by cardiology department (0.43%). Dental patients constituted 4.87% (9th among the 18 departments) of the total patient load.

When the sex distribution was examined, there were more female patients attending six out of the 16 OPDs (excluding obstetrics and gynecology), namely, rheumatology, dermatology, ENT, dental, PMR and AYUSH. Where as, there were more males than females in the rest, namely, general medicine, cardiology, pediatrics, TB and chest, psychiatry, general surgery, oncology, orthopedics, ophthalmology, and casualty.

MRD data shows females constituted 49.84% among the TB and chest OPD patients and 53.23% among dental OPD patients. Interestingly, when all the departments (including obstetrics and gynecology) were put together, out of the total 1,174,605 patients, maximum number (55.09%) of patients were female, Table 1.

The comparison of year-wise patient load in all OPDs and in dental OPD is shown in Table 2. The overall patients load in all OPDs as well as dental OPD was highest in 2019 and lowest in 2020. The low OPD attendance in 2020 was evidently due to COVID-19 pandemic.

From the total dental patients (57,198) recorded in MRD, only11,225 cases whose data could be individually corroborated by written record of dental OPD registers were considered for the assessment of dental disease

Table 1: Department-wise distribution of disease burden, 2016–2020

Department	Sex				Total	Disease burden (%)
	Male	(%)	Female	(%)		
General medicine	73,453	50.94	70,736	49.06	144,189	12.28
Cardiology	2567	50.47	2519	49.53	5086	0.43
Pediatrics	39,081	51.75	36,432	48.25	75,513	6.43
Rheumatology	18,005	45.34	21,710	54.66	39,715	3.38
T.B and chest	12,145	50.16	12,067	49.84	24,212	2.06
Skin	54,442	49.61	55,297	50.39	109,739	9.34
Psychiatry	13,363	55.28	10,809	44.72	24,172	2.06
General surgery	48,084	51.75	44,832	48.25	92,916	7.91
Oncology	20,121	51.34	19,073	48.66	39,194	3.34
Orthopedics	38,879	50.61	37,940	49.39	76,819	6.54
Ophthalmology	24,729	50.15	24,577	49.85	49,306	4.20
ENT	22,288	49.38	22,844	50.62	45,132	3.84
Dental	26,749	46.77	30,449	53.23	57,198	4.87
Obstetrics and gynecology	0	0	129,037	100	129,037	10.98
PMR	14,631	49.55	14,897	50.45	29,528	2.51
Casualty	91,081	51.50	85,759	48.50	176,840	15.06
AYUSH	27,898	49.81	28,111	50.19	56,009	4.77
Grand total	527,516	44.91	647,089	55.09	1,174,605	100

Table 2: Distribution of disease burden of dental OPD for the years 2016–2020

Year	Dental patient			Total patient	Disease burden (%)
	Sex		Total		
	Male	Female			
2016	5462	5754	11,216	225,167	4.98
2017	5781	6273	12,054	244,161	4.94
2018	6367	7507	13,874	266,129	5.21
2019	6672	7939	14,611	286,685	5.10
2020	2467	2976	5443	152,463	3.57
Total	26749	30449	57,198	1,174,605	4.87

OPD: Outpatient department

Table 3: Distribution of dental patients in respect to caste and sex in TRIHMS Hospital, n=11,225

Sex	Caste (%)		Total (%)
	Non-tribal	Tribal	
Female	991 (8.8)	5736 (51.1)	6727 (59.9)
Male	977 (8.7)	3521 (31.4)	4498 (40.1)
Total	1968 (17.5)	9257 (82.5)	11,225

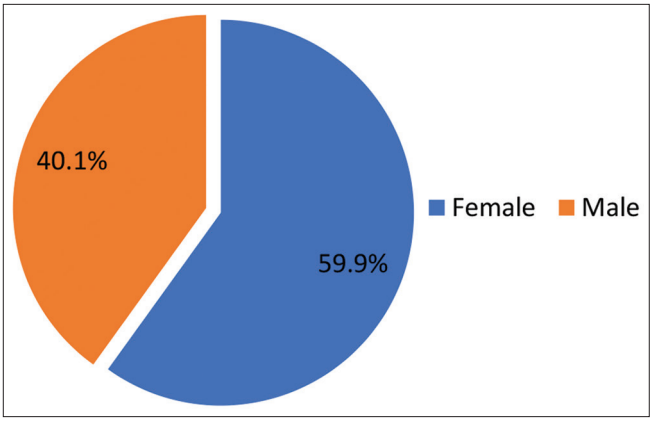

Figure 1: Percentage of dental patients according to gender

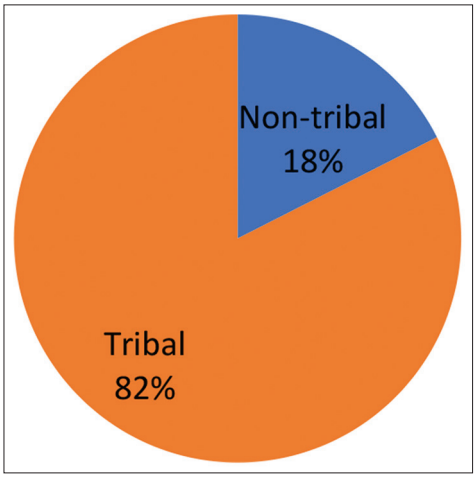

Figure 2: Percentage of dental patients according to caste

spectrum, sex, and caste distribution as shown in Tables 3 and 4. Majority of dental OPD patients (59.9%) were female (Figure 1) and most of all dental patients (82.5%) were tribal (Figure 2). Tribal female constituted more than half of dental OPD patient load.

All dental diagnoses were sorted into 97 categories as perICD-10 code[7], as shown in Table 4. The five most common dental diseases were arranged in frequency (Table 5) were: 67.1% caries (K02.9), 5.3% root stamp/retained tooth (K08.3), 3.7% complication of caries (K03.8), 2.6% calculus and stain (K03.6), and 2.5% trauma (S02.5). Dental caries, root stamp, complication of caries, and dental calculus/stain were more commonly seen in females. However, a greater number of male patients were suffering from trauma-related cases (SO2.5) (Table 5).

Table 4: ICD-10 code of the dental diseases classified by gender in 11,225 patients

Code	Sex		Total	Code	Sex		Total	Code	Sex		Total	Code	Sex		Total
	Female	Male			Female	Male			Female	Male			Female	Male	
1. First diagnosis:															
B02.9	2	0	2	K03.7	4	0	4	K10.3	1	0	1	R22.0	0	2	2
B37.8	0	2	2	K03.8	233	160	393	K11.7	2	0	2	R25.2	0	1	1
C02.9	1	1	2	K03.9	1	0	1	K11.8	0	2	2	R29.8	1	0	1
C06.9	1	0	1	K04.7	37	22	59	K11.9	1	1	2	R43.9	1	0	1
C14.0	0	1	1	K04.9	64	46	110	K12.0	14	12	26	S00.5	1	1	2
C41.9	0	1	1	K05.0	24	16	40	K12.2	1	1	2	S01.5	0	1	1
D18.0	0	2	2	K05.1	15	7	22	K12.3	2	1	3	S01.8	0	1	1
J02.9	1	0	1	K05.2	7	7	14	K13.1	1	1	2	S02.4	1	1	2
K00.1	2	2	4	K05.3	106	74	180	K13.2	1	1	2	S02.5	124	148	272
K00.2	1	0	1	K05.6	91	95	186	K13.5	5	4	9	S02.6	2	5	7
K00.3	1	0	1	K06.0	3	5	8	K13.7	2	0	2	S03.2	3	2	5
K00.4	2	1	3	K06.1	9	12	21	K14.0	0	1	1	S09.9	0	2	2
K00.6	20	26	46	K06.3	5	2	7	K14.5	0	2	2	S42.4	2	2	4
K00.7	0	1	1	K06.8	125	54	179	K14.6	1	0	1	Z01.2	7	13	20
K01.0	1	0	1	K07.2	3	1	4	K14.8	1	1	2	Z02.0	96	135	231
K01.1	53	43	96	K07.3	8	1	9	L03.9	1	0	1	Z02.1	7	6	13
K02.3	4	3	7	K07.4	22	9	31	L43.9	7	3	10	Z02.5	34	48	82
K02.5	4	7	11	K07.6	15	19	34	L50.9	1	0	1	Z02.9	8	4	12
K02.6	7	2	9	K08.1	59	33	92	M26.3	4	2	6	Z47.0	0	3	3
K02.9	4641	2833	7474	K08.2	8	1	9	M26.4	4	3	7	Z53.9	1	0	1
K03.0	34	18	52	K08.3	334	243	577	M27.3	1	1	2	Z97.2	0	1	1
K03.1	24	18	42	K08.4	3	1	4	M27.6	0	1	1	Z98.8	1	2	3
K03.2	16	11	27	K08.5	13	5	18	Q35.9	2	1	3				
K03.5	2	2	4	K08.8	93	61	154	Q37.9	1	2	3				
K03.6	152	108	260	K08.9	120	116	236	R19.6	14	8	22				
2. Second diagnosis:															
K00.6	2	0	2	K03.6	18	12	30	K05.6	2	4	6	K08.9	7	6	13
K01.1	3	6	9	K03.7	1	0	1	K06.1	6	7	13	K12.0	1	0	1
K02.5	0	2	2	K03.8	8	8	16	K06.3	2	0	2	K13.1	1	0	1
K02.6	0	1	1	K04.7	14	16	30	K06.8	4	1	5	K13.5	0	1	1
K02.9	30	29	59	K04.9	2	1	3	K07.6	4	1	5	L03.9	1	1	2
K03.0	2	1	3	K05.0	3	3	6	K08.1	3	1	4	R19.6	9	4	13
K03.1	1	2	3	K05.2	7	1	8	K08.3	18	8	26	R50.9	1	0	1
K03.2	3	2	5	K05.3	1	0	1	K08.8	1	0	1	S02.5	3	6	9
3. Third diagnosis:															
K03.8	0	3	3	K05.2	0	1	1	K08.8	1	2	3	K019.6	2	1	3
K04.7	0	1	1	K0.5.6	1	0	1	K08.9	1	2	3				

Table 6 shows that maximum dental patients (66.3%) were adults. Among the pediatric (below 18 years) dental patients, 5.1%, 20.1%, and 8.5% belonged to 0–4, 5–12, and 13–17 years age group, respectively. For all age groups, except 5–12 years, a greater number of female patients were suffering from dental problem in comparison to males (Figure 3).

DISCUSSION

The term burden of disease generally describes the total, cumulative consequences of a defined disease or a range of harmful diseases with respect to disabilities in a community. These consequences include health, social aspects, and costs to society.[8]

Statistics shows dental OPD patient load constituted 9th largest (57,194 cases or 40 patients/day) among all OPDs. It needs a special mention that there are more than 45private dental clinics in Itanagar Capital Complex (ICR), besides RK Mission Hospital which has a well-established dental unit.

Out of the 495 registered dental surgeons (as per Arunachal Pradesh Dental Council Registration updated till June 2022), at least half them (roughly 250 or more) can be assumed to be working or practicing in the state capital, ICR. The opportunity to earn a better income, to utilize skills, good living conditions, education opportunities for children, and safe working and living environments are other important job attributes which tilt the balance in favor of urban location[9] makes this screwed distribution of health-care providers in the entire country.

It is commonly observed that most tribal patients with initial symptoms prefer to visit private clinics and land up in dental departments of TRIHMS or RK Mission

Table 5: Gender-wise distribution of common five dental problems (n =11225)

ICD-10 code	Diseases	Sex		Total (%)
		Female (%)	Male (%)	
K02.9	Carious	4671 (62.01)	2862 (37.99)	7533 (67.1)
K08.3	Root stamp, retained tooth	352 (58.37)	251 (41.63)	603 (5.3)
K03.8	Carious broken, sensitivity	241 (58.50)	171 (41.5)	412 (3.7)
K03.6	Calculus, stain	170 (58.62)	120 (41.38)	290 (2.6)
S02.5	Fracture, trauma	127 (45.20)	154 (54.80)	281 (2.5)

Table 6: Age and sex distribution of dental patients in TRIHMS Hospital, n=11,225

Age group	Sex		Total(%)	0–17 years versusabove 18years
	Female (%)	Male(%)		
0–4	295 (50.95)	284 (49.05)	579 (5.1)	3787 (33.7%)
5–12	1100 (48.65)	1161 (51.35)	2261 (20.1)	
13–17	604 (63.78)	343 (36.22)	947 (8.5)	
18–60	4680 (63.65)	2672 (36.35)	7352 (65.5)	7438 (66.3%)
>60	48 (55.81)	38 (44.19)	86 (0.8)	
Total	6727 (59.9)	4498 (40.1)	11,225 (100)	

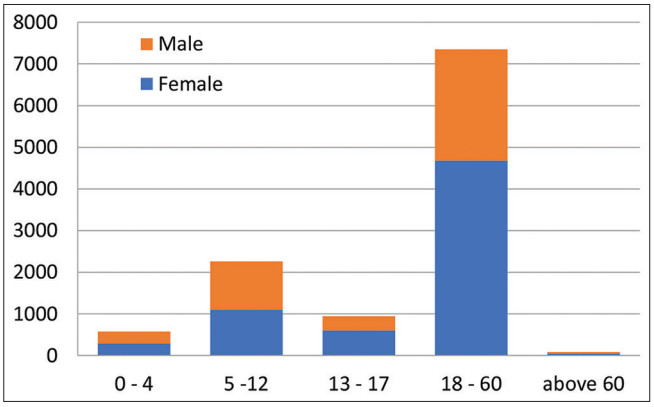

Figure 3: Age group-wise distribution of dental patients

Hospital for severed or complicated conditions. At present, orthodontic and prosthodontic services are available only in the private clinics. Therefore, the number of dental patients coming to TRIHMS is just the tip of the iceberg. In spite of the overwhelming evidence that dental health plays a great role in the health of people, perhaps due to the fact that dental health issues are seldom cause immediate death or fatal illness, dental/oral problems are seldom considered as important health problems in the society.

There were more female patients (53%) attending dental OPD as well as overall (55%) OPD patients. This may be explained partly from the so-called "male-female health survival paradox" (i.e., males report better health than females, but encounter higher mortality at all ages). There is growing evidence to conclude that men are healthier, but have substantially higher mortality rates.[10]

Majority (66.3%) of dental patients were adult and senior citizens (>18years of age). This could be due to that TRIHMS does not offer pedodontics and orthodontic services, hence, the pediatric patients go to the private sector or outside the state for specialized dental care. Again, edentulousness, xerostomia, soft-tissue lesions, or poorly fitting dentures affect eating and food choices are major concerns thus impairing the overall health-related quality of life of senior citizens.[11]

Among the 97 different types of dental problems, the most common were "tooth caries" and related problems such as "retained root stamp/tooth," "broken tooth," and "sensitivity." The prevalence of dental caries in our study is 67.1%, which is comparable to the findings from a study in Tamil Nadu and pediatric dental caries prevalence in India showing approximately 60–65%.[12]

Oral diseases hamper activities at school and occupation. As a consequence, the treatment need is enhanced nowadays. Good oral hygiene is directly related to good health. Maintaining good oral health prevents oral diseases such as tooth decay and gum diseases, indirectly prevents diabetic, heart diseases, and many other health issues as well. In the context of Arunachal Pradesh, there is a need to know the actual prevalence as well as the spectrum of the oral and dental diseases in the local population, the evidences may prove helpful in planning of community health programs and education of the masses in oral and dental care and oral hygiene.

Limitations of the study

1. We analyzed retrospective data available from MRD section, so we were unable to retrieve many important parameters for the present study.
2. Patients above the age of 18 years were simply stated as "A" (adult), so age distribution could not be compared as done in other studies.

CONCLUSION

In absolute numerical term, dental cases constitute one out of 20 patients (9th in descending order among all OPDs) appear to be the tip of the iceberg of the actual number of dental patients in the population. Except for acute toothache or complicated local infection, other dental problems are usually considered trivial, hence, dental health is often neglected or omitted in all health-related discourses. Doing so is to forget the fact how impactful poor dental health can be on morbidities such as diabetes mellitus, cardiovascular diseases, cancer, immune-suppressed, and many other health conditions. If there were a yardstick (for objective assessment) to measure the actual disease burden (financial cost, mortality, morbidity, and other social parameters affected by a particular disease), it would be apparent that the number of patients coming to OPD are only the tip of the iceberg in the population. Majority of dental conditions are related to dental caries and its complications, hence, preventive efforts against caries will be more logical and economical approach in dental health program.

Arunachal Pradesh has a long way to go with regard to provision, access, and utilization of oral care. Existing data show that the presence of dentists and treatment provisions in government-run health-care establishments is largely inadequate. Unregulated and costlier private oral care prevailing commensurate the importance to preventive and curative aspects of dental health services, planning of community health programs, and education of the masses in oral and dental care/hygiene and in the overall plan of the health department of the state.

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TL- Concept and design of the study, prepare first draft of manuscript, and data collection; **TT-** Reviewed the literature and manuscript preparation; **MJ-** Concept, coordination, and prepare of manuscript; **PV-** Prepare of manuscript, methodology, and revision of the manuscript; and **NS-** Statistical analysis and interpretation.

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