Original Research

PREVALENCE OF DENTAL CARIES AMONG 12–14 YEARS OLD CHILDREN IN A METROPOLITAN CITY OF NEPAL

K.Sayed Akber Pasha[1], Manu Rana[2], Swagat Kumar Mahanta[3], Mohd. Arif[4]

[1] *Prosthodontist,salmar,karkala,Karnataka,India*
[2] *Department of Conservative Dentistry and Endodontics, ,College Of Medical Sciences, Bharatpur*
[3]*Department Of Community Dentistry M.B.Kedia Dental College Birgunj,*
[4] *Department of Dentistry Sher-i-Kashmir Institute of Medical Sciences Bemina, Srinagar (Jammu & Kashmir),India*

A R T I C L E   I N F O

A B S T R A C T

Aim: The aim of this pilot study were to measure the incidence of dental caries in school children aged 12–14years among private schools in birgunj. **Materials and methods:** A cross-sectional study was conducted in birgunj from 2016 to 2017 via school health camps organised by dental college. A total of 500 children aged 12–14 were randomly selected from schools located in vicinity of birgunj city. Three calibrated examiners using World Health Organization (WHO) criteria to diagnose dental caries performed the clinical examinations. Data analyses were subsequently conducted. **Results:** The mean decayed, missing, and filled teeth index values were respectively 3.34, 3.29, and 2.88 for 12, 13, and 14 year-old subjects. Caries prevalence was 53.4%. The prevalence of caries increased with increasing of age, while the caries index (DMFT) decreased with increasing age. This increasing in prevalence was statistically insignificant. Dental caries were affected by socio-demographic factors; significant differences were detected between female and male children, where more female children showed dental caries than male children. **Conclusion:**The result of this study is a pointer to the fact that there still exist a large segment of the population who continue to remain ignorant about the detriment effects of poor oral health. Dental caries can be prevented by proper hygienic habits, awareness among students and their mothers.

INTRODUCTION

Dental caries is defined as a multi-factorial infectious disease caused by plaque bacteria. When food enters the mouth, bacteria metabolize fermentable carbohydrates, producing acids, which diffuse into hard dental tissue, and demineralize tooth enamel.1 In the absence of proper denial hygiene, this process has an increased likelihood of resulting in dental caries. Dental caries currently represents the most common chronic disease among children; it is five times more common than asthma, and seven times more common than seasonal allergies.2 Yee et al. (2002) reported in third world countries, dental caries is the fourth most expensive disease to treat. For children of most low-income countries, treating dental caries is estimated at US $3513 per 1000 children, which would exceed the country's total health budget.3 Dental treatment costs could easily exhaust a low-income country's entire health budget, a budget that is already extended to its capacity, or simply does not exist. However, no country claims to have caries free children and the explanation for why young children develop dental caries is complex.4

Dental caries is commonly measured by the sum of decayed, missing, and filled number of teeth (DMFT index). This value has been widely applied to

* Corresponding author*: Manu Rana, Department of Conservative Dentistry And Endodontics, ,College Of Medical Sciences, Bharatpur, Nepal. E-mail: ranamau86@gmail.com*

assess the dental caries status at the population level for public health planning and policy-making purposes.5 The DMFT index, first introduced by Klein et al. in 1938, is a cumulative caries measure, which indicates caries occurrence, including past and present dental caries. The DMFT index has been in use for more than 76 years, and it remains the most commonly employed epidemiological index for assessing dental caries.6

WHO and Federation Dentaire International (FDI) established the first global oral health goal, as follows: by the year 2000, children reaching the age of 12 will not possess an average of more than three decayed, missing, and filled permanent teeth (DMFT). During the following decades, most high-income countries reached or even exceeded these goals, but for many low-income countries, this remains a remote aspiration. Based on DMFT values, WHO generated a scale to classify caries severity: DMFT values between 0.0 and 1.1 were very low; 1.2–2.6 were low; 2.7–4.4 were moderate, 4.5–6.5 were high, and values exceeding 6.6 were very high.

Epidemiologic studies from different parts of the world reported that DMFT values and caries prevalence was high among school children (12–14 years old) in some countries, and higher than the figure recommended by WHO.

Unfortunately, to date, the dental caries status among the school children population in birgunj has never been documented.

METHODOLOGY

A cross-sectional study, the study was carried out in the private schools in vicinity of birgunj during the period from 2016 to 2017 and the target population consisted of children from 12 to14 years. Approval and permission for the study were given from the ethical research committee and administration of private schools.

Dependent variables were Clinical status of permanent teeth: Sound, Decayed, Missing, Filling,DMFT(decay, missing, filling teeth index).

Independent variables were gender (female and male) and age (12, 13 and 14). The main researcher, a qualified dentists, was carry out the clinical examination to avoid inter-examiner variability and recording of data was done by a trained dentist who was assist the main researcher throughout data collection. The children were examined in a supine position on the table in the class room. The clinical examination was carried out using disposable mouth mirrors, sharp explorers, spoon wood while dentist was wear head light, mask and gloves. The presence of caries determined according to the WHO criteria, by using the decayed, missing and filled tooth index (DMFT). Data were registered and elaborated by statistical package for social sciences version 15(SPSS).

RESULTS

Table 1. shows the distribution of the studied population according to gender and age. Out of 500 children examined, 275 (55%) were males while 225(45%) were females.The mean of age was 13.495±1.1215. The mean age of males was (13.49±1.119) and females (13.50±1.124) which was statistically insignificant, p=0.972.

Table 2 displays the dental status of the children. Caries is present by children making 53.5 %. It distributed as decayed, missing, filling and a combination of them making 45.8%, 0.8%, 0.6% and 6.2% respectively.

Ages (years)	Gender				Total	
	Males		Females			
	No.	%	No.	%	No.	%
12	89	32.2	72	32	161	32.2
13	92	33.4	74	32.8	166	33.2
14	94	34.2	79	35.1	173	34.6
Total	275	55	225	45	500	100
Mean age	13.49±1.119		13.50±1.124			

Table 1. Distribution of the studied population according to gender and age

Dental status	N	%
Sound	233	46.6
Decayed	229	45.8
Missing	4	0.8
Filling	3	0.6
More than one	31	6.2

Table 2.Distribution dental status of permanent teeth among primary school children

Age (Years)	No.	Caries prevalence					Caries index DMFT		
		Yes		No		X^2	Mean	SD	P
		No	%	No	%				
12	161	73	45.3	88	54.7	0.027	3.34	1.935	0.086
13	166	76	45.7	90	54.2	P=0.98	3.29	1.948	
14	173	80	46.2	93	53.7		2.88	1.961	

Table 3. Prevalence of dental caries among primary school children according to age

Gender	No.	Caries prevalence					Caries index DMFT		
		Yes		No		X^2y	Mean	SD	P
		No	%	No	%				
Male	275	110	40	165	60	7.77 P=0.005	3.22	1.945	0.100
Female	225	119	52.8	106	47.2		2.90	1.929	

Table 4. Prevalence of dental caries among primary school children according to gender
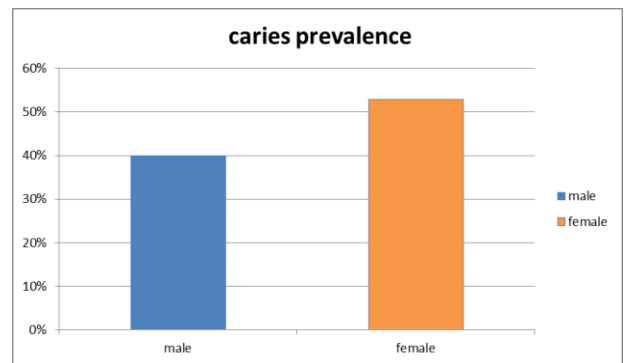

Table 3 shows that the prevalence of caries increased with increasing of age, while the caries index (DMFT) decreased with increasing age. This increasing in prevalence is statistically insignificant, P=0.98 and the caries index is also insignificant, p=0.086.

Table 4 illustrates the caries index and prevalence according to gender. Caries prevalence in this study was higher in females than males and statistically significant, p=0.005.The caries index is statistically insignificant p=0.100.

DISCUSSION

Dental caries is the most common chronic disease of the oral cavity and the common condition affecting the general health of children. Since a large

proportion of the population experience it in their life span. The estimation of its prevalence becomes important to improve oral health. The current study has been conducted to determine the prevalence of caries and its relation to age and gender, among primary school children in birgunj. The results of the present study revealed a high prevalence 53.4% of caries among school children. The caries prevalence in this study was higher in females than males and statically significant p=0.005. It is also obsereved that prevalence of caries increased with increasing of age, while the caries index (DMFT) deceased with increasing age, but this increasing in prevalence is statistically insignificant, P=0.98 and the caries index is also insignificant, p=0.086.

Notwithstanding its strengths, clear limitations were identified in this study. It is therefore appropriate to identify and discuss these limitations, and any effects on the results, interpretations, conclusions, and recommendations. First, dental caries were identified by clinical examinations; no radiographs were taken, which might over- or under-estimate the actual magnitude of the problem. This limitation applies to most studies using WHO criteria for dental caries diagnosis.7-9

Second, the DMFT index was based strictly on WHO diagnostic criteria to identify dental caries. However, WHO criteria are binary presence/absence data, i.e. presence or absence of decay, and does not differentiate among the various stages of dental caries (initial and advanced carious lesions, and noncavitated and cavitated carious lesions), which might subsequently under- or over-estimate dental caries incidence and severity.10

Third, in the present research only affected teeth were recorded on a diagnostic chart, without determining the tooth surfaces affected by caries. Additional studies that include decayed, missing, and filled surfaces (DMFS) should be conducted. Finally, the study design was cross sectional; therefore, evidence regarding casual relationships could not be confirmed. Undoubtedly, further longitudinal studies are required to overcome this limitation. Therefore, the data derived from our analysis should be interpreted with caution, considering all previous limitations.

CONCLUSION

Dental caries is not only a medical problem but also a social problem. Awareness among students can be generated by the school teachers because they are the role model for the students. Parents should be aware of the dental health of their children. Parent/teacher meetings should be regularly organized during which parents are educated on the importance of good hygiene practices in disease prevention. Health education should be incorporated within the regular activities of the school. Overall education, particularly female education can help to solve the problems in future.

REFERENCES –

1. Featherstone, J.D. Dental caries: a dynamic disease process. Aust. Dent. J. 2008; 53, 286–291.

2. U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General — Executive Summary. Rockville, MD, National Institute of Health and Craniofacial Research, (accessed 21th February, 2014).

3. Yee, R., Nepal, K., Sheiham, A. The burden of restorative dental treatment for children in Third World countries. Int. Dent. J. 2002; 52, 1–9.

4. World Health Organization. Oral Health Promotion: An Essential Element of a Health-Promoting School. WHO Information Series on School Health (Document Eleven). WHO, Geneva, 2003.

5. Jakobsen, J.R., Hunt, R.J. Validation of oral status indicators. Community Dent. Health.1990; 7, 279–284.

6. Broadbent, J.M., Thomson, W.M. For debate: problems with the DMF index pertinent to dental caries data analysis. Community Dent. Oral Epidemiol. 2005; 33, 400–409.

7. Al-Sadhan, S. Dental caries prevalence among 12–14 year-old schoolchildren in Riyadh: a 14 year follow-up study of the oral health survey of Saudi Arabia phase I. Saudi Dent. J.2008; 18, 2–7.

8. Campus, G., Cagetti, M.G., Senna, A., Sacco, G., Strohmenger, L., Petersen, P.E. Caries prevalence and need for dental care in 13–18-year-olds in the municipality of Milan, Italy. Community Dent. Health.2008; 25, 237–242.

9. Mtaya, M., Brudvik, P., A. strøm, A.N. Prevalence of malocclusion and its relationship with socio-demographic factors, dental caries, and oral hygiene in 12-to 14-year-old Tanzanian schoolchildren.Eur. J. Orthod. 2008; 31, 467–476.

10. Pine, C., Harris, R.. Community Oral Health, second ed. Quintessence Publishing, USA.2007; 166–167.