DENTAL CARIES IN NEPAL : A 10-YEAR COMPARISON

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Abstract

Many researchers have suggested that dental caries is reducing in industrialised societies but increasing in the developing world. The aim of this study has been to assess the current situation in Nepal by comparing caries prevalence in cross-sectional studies a decade apart. This shows a rising incidence in caries in every age group examined.

Introduction

As Nepal develops and urbanises the background in which its citizens live and work is rapidly changing. Health epidemiology indicates some improvement in under-5 mortality rates (UNICEF, 1997) but diseases such as tuberculosis, intestinal infections and HIV/AIDS continue to present a serious threat to the population (Sapkota, 1997).

Dental caries research in Nepal has been carried out by a few oral health pioneers during the past 20 years but studies have usually been small-scale and uncalibrated. Such information is useful, nonetheless, and comparison over a suitably lengthy period can help give us insight into disease incidence (i.e. the increase over time). Such important information can help in the planning of preventive and curative services and in the prediction of future manpower requirements.

Materials and Method

1. All eight caries prevalence studies in Nepal (country code 569) were obtained from the World Health Organisation Global Oral Data Bank (GODB). These covered the period 1977-1989. Because of the diversity of examiners, varied sample sizes and lack of information about calibration the data for both urban and rural locations were pooled and averaged for each WHO age cohort (i.e. 6, 12, 15 year-olds *etc*) using the formula:

$$\sum \frac{n\ (sample) \times mean\ (sample)\ DMFT}{n\ (total)}$$

Seven of the eight studies were carried out during the 1980's. For convenience it was decided to attribute the label '1985' to the overall mean Decayed, Missing & Filled Tooth (DMFT) results during this period.

2. A Pathfinder survey (WHO, 1987) was completed in April and May 1995 in Palpa, Western Nepal (McDonald, 1996). One examiner (NM) was used throughout and subjects were from both rural and peri-urban locations. The study was uncalibrated but 10% of subjects were recalled during the period producing 92% agreement in caries diagnosis. Both children and adults were examined as follows:

a) **Children:** Verbal consent for examination was obtained from school headteachers and all children in the 6, 12 and 15 year-old age groups (total n=178) were examined in natural light whilst supine on a school bench. Dental caries was diagnosed using a plane no.4 mouth mirror only. A conservative protocol designated caries in enamel only as 'arrested'. This, while scoring on the 'D' (decayed) component of the DMFT, did not constitute a treatment need.

A pre-trained assistant recorded data on WHO Simplified (1986) Oral Health Assessment forms. The Nepali language was used throughout by examiner and recorder.

b) **Adults:** WHO cohorts 35-44 years (n=162) and 55+ years (n=30) were included in a hospital-based survey of employees and OPD patients who had not self-referred with dental complaints. Verbal consent was obtained from each subject prior to examination. Randomisation was not carried out. The subjects were simply invited to have a dental check-up whilst at work or as they emerged from the outpatients department. Males and females were examined 3:2 in this study.

Results

Caries results from the first study period (1985) are summarised in Table 1.

Table 1 Summary information 1985: Percentage of subjects affected by dental caries with mean overall decayed, missing and filled teeth in all age groups in Nepal.

Age Cohort (years)	*Number of subjects*	*% affected by caries*	*Mean overall DMFT (dmft)*	*DT (dt)*	*MT*	*FT*
6	1047	20.53	0.68	0.68	-	-
12	1392	26.00	0.61	0.51	-	-
15	1376	45.49	1.38	1.32	-	-
35-44	433	58.89	2.46	1.54	0.92	-
55+	27	44	3.3	0.4	2.9	-

Caries results from the second study period (1995) are summarised in Table 2.

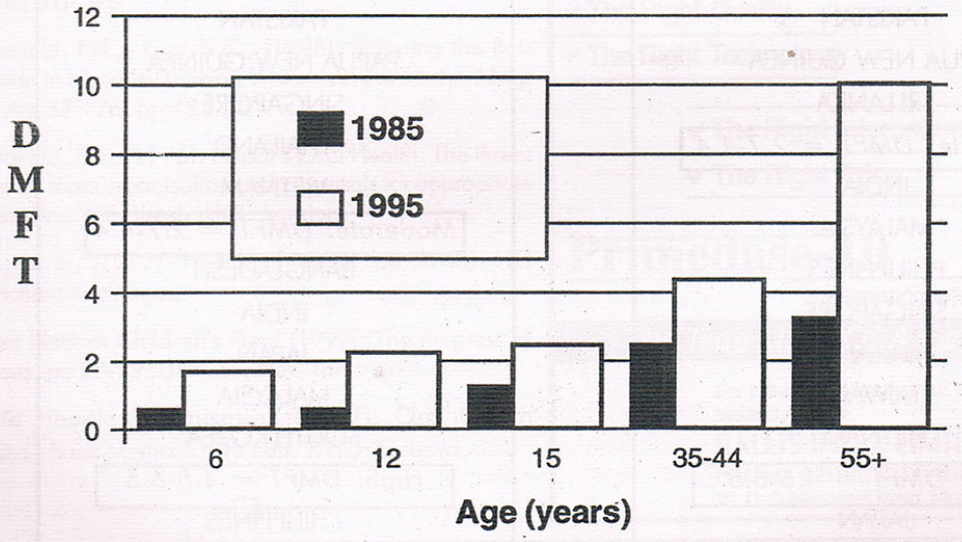
Table 2 Summary information 1995: Percentage of subjects affected by dental carie with mean overall decayed, missing and filled teeth in all age groups in Nepal.

Age Cohort (years)	*Number of subjects*	*% affected by caries*	*Mean overall DMFT (dmft)*	*DT (dt)*	*MT*	*FT*
6	48	52.08	1.79	1.79	0.00	0.00
12	69	62.32	2.25	2.22	0.03	0.00
15	61	65.57	2.51	2.39	0.10	0.02
35-44	162	75.31	4.35	2.39	1.43	0.54
55+	30	77.5	10.06	2.11	7.94	0.00

Discussion

A comparison of DMFT results from 1985 and 1995 would seem to indicate that dental caries trends are upwards. Although provisos over calibration have been mentioned the hypothesis is put forward that Nepal is moving from the 'very low'

Fig 1. 1985 and 1995: Mean DMFT/dmft for age cohorts.



(12 year-old DMFT 0-1.1) caries ranking it has historically occupied with China (WHO, 1994) to a new 'low' *(12 year-old DMFT 1.2-2.6)* position. This is shown graphically in Fig 1 with a caries prevalence rise in all age cohorts.

It is noted that 12 year-old children (a key indicator) have experienced the greatest incremental rise in caries over the decade. (Because of low sample sizes the results for the 55+ age cohort are less reliable). Whereas children in this cohort had a DMFT of 0.61 in 1985 this has risen to 2.25 in 1995. The incidence starts to rise in the deciduous dentition (6 year cohort) and is also reflected in teenagers (15 year cohort) and in (35-44 year) adults in whom the full extent of established disease is seen. Furthermore it is notable that in 1985 there are minimal MT (missing teeth) and no FT (filled teeth) components. Ten years later MT and FT show a small rise. This may possibly reflect an increase in the availability of dental services over the decade.

Table 3. DMFT rankings for 12 year-olds living in various Asian countries in 1985 and 1993. *(Modified from Oral Health Unit, WHO, 1994).*

1985	1993
Very low: DMFT = 0-1.1	*Very low: DMFT = 0.1.1*
CHINA	CHINA
NEPAL	*Low: DMFT = 1.2-2.6*
SOUTH KOREA	BHUTAN
Low: DMFT = 1.2-2.6	CAMBODIA
BANGLADESH	HONG KONG
BURMA	INDONESIA
HONG KONG	LAOS
INDONESIA	MALDIVES
MONGOLIA	*NEPAL*
PAKISTAN	PAKISTAN
PAPUA NEW GUINEA	PAPUA NEW GUINEA
SRI LANKA	SINGAPORE
Moderate: DMFT = 2.7-4.4	THAILAND
INDIA	VIETNAM
MALAYSIA	*Moderate: DMFT = 2.7-4.4*
PHILIPPINES	BANGLADESH
SINGAPORE	INDIA
THAILAND	JAPAN
TAIWAN	MALAYSIA
VIETNAM	SOUTH KOREA
High: DMFT = 4.5-6.5	*High: DMFT = 4.5-6.5*
JAPAN	PHILIPPINES

A comparison of 12 year-old DMFT in Nepal with other Asian countries between 1985 and 1993 is shown in Table 3. Nepal's near neighbours (India, Bangladesh and Pakistan) have either retained or increased their caries rankings. Only China has remained in the 'very low' band and Thailand, Singapore and Vietnam are the only countries to actually reduce their 12 year-old DMFT.

Conclusions

1) Future trends -

There are clear signs that dental caries is increasing in all age groups in Nepal. The number of carers must also increase to cope with this. Questions need to be asked about which level of carer should be trained and whether such carers will be equitably distributed throughout the country.

2) Preventive strategies -

There are a number of options available to help prevent dental caries. The most important of these involves the use of fluoride. In Nepal water fluoridation presents problems because of the many separate supplies. Fluoridated toothpaste can be safely recommended instead (McDonald & Cox, 1998) and should be advocated by the Nepal Dental Association. The Association should also consider putting its logo on tested, locally-produced, tooth-healthy products to boost consumer confidence and raise the profile of responsible manufacturers and of the whole dental profession.

References

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