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Anangu oral health — the status of the Indigenous population of the Anangu Pitjantjatjara lands

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The Indigenous population (2635) of the Pitjantjatjara and Yankunytjatjara speaking communities of the NW of SA call themselves anangu. Since the land rights legislation the place they call home is named the Anangu Pitjantjatjaraku (AP) Lands comprising about one tenth of the area of South Australia. The interpretation and discussion of the oral health data presented in this paper represent the opinions of the authors. We do not speak for anangu or necessarily report the views of the Nganampa Health Council (NHC). The NHC is the anangu controlled health service of these communities.

The oral health needs of these communities was highlighted following surveys between 1982–84 initiated by the Aboriginal Health Organisation of SA (AHO). The NHC commenced a regular dental service in 1986. For most of the time since then the priorities had been to provide regular access to timely oral care. Service provision data was collected with evaluation support from the South Australian Dental Service (SADS) that documented the activity of the program. It is appropriate to highlight that the program has operated for many of these years in the context of limited resources, with until recently, modest objectives.

A recent redefinition of the NHC Oral Health Program Aims and Objectives has included an ongoing evaluation of service activity and outcomes, which with appropriate levels of resourcing will develop into a model oral health program for remote Australia. The first step of collation of oral health information about the population in the remote Pitjantjatjara communities of South Australia begins a new phase. This presentation reports on the first year of this evaluation and presents some implications about the oral health of Indigenous Australians.

INTRODUCTION

The AHO Dental Report (Chryssides 1986) recommended “that a regular dental service is made available to the Aboriginal People in all (remote) areas” and simply noted some of the oral disease indicators. From the apparent survey results of 462 people from the AP Lands it was reported that “the average number of teeth with untreated dental decay was 1.58”. Also reported was periodontal disease from the same surveys of “no disease 11%, mild/moderate disease 66%, advanced 23%”.

The report Adult access to dental care — Indigenous Australians indicated significantly poorer oral health than non-Indigenous Australians and identified the need to collect more information about the oral health of Indigenous Australians. A collaboration between the NHC and the Dental Statistic and Research Unit (DSRU) has developed a system of oral health data collection as part of the routine delivery of
dental services by the NHC Dental Program. This paper highlights some significant trends and indicates that further investigation and investment need to be made in improving oral health for Indigenous Australians. We hope that this contributes to improving oral health outcomes for these populations.

There have been earlier reports of Aboriginal children’s low dental caries experience (Kailis 1971; 1971b)\(^4,5\) compared to other Australian children. As the improvements in child dental health from water fluoridation, better understanding of dental caries, and access to dental care became more widespread in the Australian community a worsening of the situation for Aboriginal children was reported (Davies et al 1991)\(^6\). Reporting of high dental caries experience (Schamschula et al 1980)\(^7\) and loss of teeth amongst Aboriginal adults is also noted. The increasing significance of periodontal diseases and tooth loss for adults with non-insulin dependant diabetes mellitus (NIDDM) in the Aboriginal communities in Central Australia has been identified (Simmons 1988)\(^8\). The epidemiology of periodontal disease elsewhere in the world has a reported prevalence in some studies of 13% (severe) to 44% (moderate)\(^9\) and that periodontal disease accounts for 30% to 35% of tooth loss in adults\(^10\). The association between periodontal disease and control of diabetes\(^11\) is now well recognised. A relationship between periodontal disease and other systemic diseases\(^12\) is gaining more attention in the literature.

A changing pattern of oral health has been observed in the 15 years of operation of the NHC Dental Program. A characterisation of the present oral health status and comparisons with earlier data from the same population (Bourke C et al 1991)\(^13,14\) and other published reports of the oral health of Australians are presented. The opportunity to follow the oral health indices of this population is explored and discussion of the issues in providing dental services and the impact and implications is described.

**METHODS**

An optical mark read (OMR) scan form has been developed with the DSRU for use by the NHC Oral Health Program (Program). These child and adult oral health records are modified from similar forms used for recording in other surveys\(^15\). Some specific modifications have been included to reflect the particular circumstances in remote Aboriginal communities such as school-based toothbrushing, gingivitis scores and fluorosis index. The authors (CE and SW) completed the examinations from November 1999 to November 2000 with data recorded on the OMR form by our dental assistant. During the first six months of the survey period the recording of examination data was on interim forms which were later transcribed when printing of final format was complete. The refining of the categories of data required in this time was a work in progress, which has resulted in some fewer recordings of certain data fields.

The dental examination is recorded for the first client visit of each year. Subsequent attendances in the same year record treatment received and course of care information only. It is recognised that the extra examination and recording time of this “new paperwork” adds about 5–7 minutes to each patient attendance. All child and adult clients visiting the dentist have this comprehensive oral examination and recording completed. The population sample of children includes 58% of 5–14 year olds and represents the aim to screen all school aged children. This results in a good survey
sample for school aged children. Most adult presentation is for “emergency” or an urgent specific dental problem (46.7% of all adult visits). There are insufficient resources to allow a more systematic attempt to screen all adults or promote regular dental attendance for a “check-up”. The adult sample size of 20% of the estimated population is biased towards those seeking care for existing dental problems. It is not necessarily representative of the adult population, but of those attending for dental care. Adult data is reported with this qualification.

The dental visits vary from 2–3 days for small (population 65–110) to 2 weeks for large (population 506–576) communities and cover a one-way cycle of about 600 km from the Stuart Highway to the WA border. The Program has operated a mobile dental surgery located in a Pantech light truck since 1993. This has enabled both a thorough survey and a comprehensive treatment service through ready access to dispersed communities with a modern well-equipped dental surgery. We aim to complete all urgent dental treatment needs and keep a record of follow up treatment requirements for subsequent visits.

The acceptance and ownership of this service by anangu is also of significance for the collection of oral health data. The arrival of the dental truck in the 9 communities is part of regular community life and is well received. The good attendance for dental care reflects the trust that has developed over many years. The cycle of return visits although sometimes quite irregular has become a successful way to provide access to oral care. In recent years this cycle of visits has been twice yearly. We feel that with these program issues of access, acceptance and service addressed it is both feasible and ethical to proceed with the survey. This is consistent with the respected ethos “No survey without service” adopted by Fred Hollows (Hollows and Corris)16.

We report on the common oral conditions that occupy most of the service delivery activity of the Program. Tooth decay or dental caries is the bacterial disease that causes damage to the dental hard tissues or teeth. Advanced or large dental cavities can infect the dental pulp causing pain. This dental infection can spread into periapical tissues and sometimes result in cellulitis or facial swelling. Other potentially painful symptoms from inflammation of the pulp (pulpitis) can arise earlier in the caries process. It is widely accepted that timely access to regular dental care and early diagnosis and preventive measures can effect minimal impact from dental caries. Data on dental caries is presented as the DMFT index (dmft for deciduous teeth) and records the tooth specific cumulative effect of dental caries experience. D — decayed, M — missing or F — filled because of dental caries, for T — permanent teeth. The surface specific (DMFS/dmfs) index records the caries experience of each of the tooth surfaces and is used in the 1991 survey (Bourke et al)13.

The gum diseases (periodontal diseases) are the inflammatory diseases caused by bacteria infecting the gum (gingiva) and tooth supporting structures (alveolar bone and periodontal ligament). These oral infections vary in severity and extent from reversible gingival inflammation (gingivitis) to destruction of periodontal tissues (adult periodontitis). In children the incidence of gingivitis is reported as a modified gingival index17. The Community Periodontal Index (CPI)18 is used to measure periodontal status for the adult survey. CPI scores (0–4) range from a best score (0) of periodontal health to a worst score of periodontal pockets of 6mm or greater (4).
RESULTS

The estimated resident population is taken from the NHC Population Database and shows that in the school age group 5–14 years 58 per cent of children in the population were examined in this survey.

There were 345 anangu adults surveyed with incomplete data for 8 (age) and 14 (CPI). There were 10 adults presenting with no teeth (overall edentulous 2.9%) and 95 adults with diabetes attending for oral care (27.5% of adult sample). All of the edentulous adults have diabetes (10.53% of adults with diabetes edentulous). The diabetes status for the purpose of this survey is a recorded diagnosis as per CARPA protocols and NHC maintains an electronic database that records adult chronic illness including diabetes status. This database records a diabetes prevalence of 19% for adults aged 20 years and over. This compares to diabetic screening survey results from some of these communities of 18.5% for 25–55 age group (1990–91).

Anangu child oral health

Deciduous teeth: age-specific caries experience

The deciduous caries experience of anangu children is highest at age 5 with a mean of over 3 decayed teeth (3.34). As the first deciduous teeth exfoliations commence soon after this age the dmft score declines. This is more than twice the reported rate (1.26) for Australian children in 1996. Figure 1 shows this pattern from age 4–10 years.

Anangu child caries comparisons, SA, NT, Australia

The 5–6 year old dmft and 12 year old DMFT comparison with SA, NT and national child populations (1996) are shown in Table 3. This indicates that the higher caries experience of anangu children when commencing school is not as apparent at age 12 years when permanent teeth have erupted.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Children in sample and estimated resident population</th>
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<tr>
<td>Age</td>
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</tr>
<tr>
<td>0–4</td>
<td>31</td>
</tr>
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<td>5–9</td>
<td>216</td>
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<td>10–14</td>
<td>145</td>
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<td>15–19</td>
<td>11</td>
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<td>403</td>
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<table>
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<th>Table 2</th>
<th>Adults in sample and estimated resident population</th>
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<td>Age</td>
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<td>15–24</td>
<td>120</td>
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<tr>
<td>25–44</td>
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<td>45+</td>
<td>85</td>
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<td>Age missing</td>
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Figure 1  Deciduous teeth age specific caries comparison

Table 3  Anangu child caries experience comparison SA, NT, Australia

<table>
<thead>
<tr>
<th>Population</th>
<th>Year</th>
<th>dmft (5–6 yr)</th>
<th>% dmft=0</th>
<th>DMFT (12 yr)</th>
<th>% DMFT=0</th>
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<tr>
<td>Anangu</td>
<td>2000</td>
<td>3.20</td>
<td>26.7</td>
<td>0.90</td>
<td>62.1</td>
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<td>SA</td>
<td>1996</td>
<td>1.28</td>
<td>64.4</td>
<td>0.52</td>
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<tr>
<td>NT</td>
<td>1996</td>
<td>1.90</td>
<td>52.6</td>
<td>0.73</td>
<td>65.8</td>
</tr>
<tr>
<td>Australia</td>
<td>1996</td>
<td>1.35</td>
<td>63.1</td>
<td>0.90</td>
<td>61.8</td>
</tr>
</tbody>
</table>

Aboriginal child caries experience comparison SA
The survey of caries experience of Aboriginal children in SA (Bourke et al 1991)\textsuperscript{13} compared metropolitan, rural and remote Aboriginal child groups. The communities of the AP Lands were included in the survey as the “remote” group of Aboriginal children and comparison of results are shown in Table 4. This survey reported surface specific caries data (dmfs/DMFS) and the sample number included was small at 91 anangu children in the 5–14 year age group. The authors reported that the anangu children had considerably lower caries experience than the urban and rural Aboriginal child groups at this time. Although the small number of anangu children surveyed may not be fully representative of the caries experience in 1991 the comparison is made of more than double deciduous experience now.
Table 4  Child caries experience comparison 1991 and 2000; Anangu and metro and non-metro Aboriginal children, mean dmfs/DMFS

<table>
<thead>
<tr>
<th>5–10 year age group</th>
<th>dmfs</th>
<th>5–14 year age group</th>
<th>DMFS</th>
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<tr>
<td>Anangu 2000</td>
<td>4.23</td>
<td>Anangu 2000</td>
<td>0.94</td>
</tr>
<tr>
<td>Anangu 1991</td>
<td>1.90</td>
<td>Anangu 1991</td>
<td>0.30</td>
</tr>
<tr>
<td>Metro 1991</td>
<td>5.19</td>
<td>Metro 1991</td>
<td>1.33</td>
</tr>
</tbody>
</table>

Further comparison of caries experience over time in the same population is derived from a casenote audit in 1987 of information for the NHC Annual Report (Meihubers 1987)\textsuperscript{14}. The 441 case records (1987) of anangu child caries experience are compared to this data from 2000 in Table 5. The increase in anangu child caries experience in this larger sample size is more modest and may represent a more realistic picture of changes in caries experience over the last decade.

Table 5  Anangu child caries experience comparison 1987 and 2000

<table>
<thead>
<tr>
<th>Age</th>
<th>dmft 2000</th>
<th>dmft 1987</th>
<th>DMFT 2000</th>
<th>DMFT 1987</th>
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</thead>
<tbody>
<tr>
<td>0–4</td>
<td>1.61</td>
<td>1.44</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5–9</td>
<td>2.85</td>
<td>2.00</td>
<td>0.27</td>
<td>0.11</td>
</tr>
<tr>
<td>10–14</td>
<td>0.81</td>
<td>0.40</td>
<td>1.03</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Severity of child gingivitis

A gingivitis score was recorded for 230 children in the second half of this survey after modification to the OMR scan form included this recording. Of these children 91.7% had gingivitis (gum inflammation with bleeding on probing) recorded for at least one sextant of the mouth. It is accepted that gingivitis is a reversible condition and will return to a healthy status when removal of the bacterial plaque is regularly performed (effective toothbrushing). Nearly half (41.3%) of the children surveyed had more severe gingivitis that would require some further intervention other than simple toothbrushing.

The children were asked if they brush their teeth at home or at school. 49.3% reported toothbrushing at school and 10% reported toothbrushing at home.

Anangu adult oral health

Edentulism: the loss of all teeth

Edentulism is a recent experience amongst the adult anangu population. There were no adult patients in 1987 reported to be edentulous. During this survey period 10 (2.9% overall adults) fully edentulous anangu adults attended for dental care associated with the fabrication of dentures. A further 4 adults have no remaining top or bottom teeth (one arch edentulous). All these edentulous anangu adults also had a diagnosis of diabetes.
Permanent teeth: age-specific caries experience

The caries experience of anangu adults is lower than reported for public-funded dental patients\textsuperscript{21}. The mean DMFT of 18–24 yr old anangu adults of 3.86 compares to scores of 7.27 (urban), 8.75 (rural) and 6.56 (remote) and for older anangu adults (45+) of 8.5 (dentate) compares with the 16.11 (urban), 15.70 (rural) and 13.16 (remote) amongst 45–64 yr old public-funded dental patients.

The following figures compare the results from the current survey and the casenote audit of 1987\textsuperscript{14}. This analysis is of dentate only (people with some teeth remaining) adults. In Figure 2 the rise in the DMFT of the anangu adult population is considerable in this survey of 2000. There is also a modest rise in the F or filled teeth (treated dental caries) until age 30–39. This was not the situation in the population 14 years ago. The components of the DMFT index are also examined in Figure 3 and it is apparent that the D or untreated dental caries experience does not follow this sharp rise. The M or missing teeth rises considerably after age 20–29. It is noteworthy that the considerable and rapid loss of anangu adult teeth is not due to dental caries.

Adult periodontal diseases

The adult gum diseases can vary with aetiology, severity and pathogenesis. The CPI is an indicator of gum disease activity, measuring gingival inflammation (bleeding), presence of calculus, and periodontal pocketing. It does not necessarily measure the history of attachment loss (loss of periodontium).

Table 6 compares the anangu adult scores with a survey of public-funded dental patients\textsuperscript{21}. Healthy gums were only found in 1.2% of anangu adults whilst 63.9% (80% non diabetes) had subgingival calculus present. The higher scores for calculus present, although not necessarily correlating with future periodontal pocket formation can be a predisposing factor. Subgingival calculus requires professional dental intervention for removal and cannot be reversed by personal oral hygiene. Severe gum disease is most evident when periodontal pocketing is greater than 6 mm and requires specific periodontal intervention strategies.

<table>
<thead>
<tr>
<th>Table 6</th>
<th>Anangu and public-funded dental patients\textsuperscript{21} CPI comparison, % with worst sextant score</th>
</tr>
</thead>
<tbody>
<tr>
<td>(CPI score)</td>
<td>Periodontal health (0)</td>
</tr>
<tr>
<td>Anangu adults 2000</td>
<td></td>
</tr>
<tr>
<td>Diagnosed diabetes</td>
<td>2.5</td>
</tr>
<tr>
<td>No diabetes</td>
<td>0.8</td>
</tr>
<tr>
<td>All anangu</td>
<td>1.2</td>
</tr>
<tr>
<td>Public-funded dental patients</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>5.7</td>
</tr>
<tr>
<td>Rural</td>
<td>15.6</td>
</tr>
<tr>
<td>Remote</td>
<td>5.4</td>
</tr>
</tbody>
</table>
Figure 2  Mean DMFT and filled teeth, 1987 and 2000

Figure 3  Adult tooth decay and missing teeth, 1987 and 2000
Adult anangu with diabetes have the most severe gum disease with 79% having periodontal pocketing and 45.7% with pocketing greater than 6 mm.

Figure 4 compares this pattern of periodontal disease between adult anangu by diabetes diagnosis. Advanced periodontal disease (CPI score 3 and 4) is strongly correlated with diabetes in this population.

Figure 4  Per cent with maximum CPI score by diagnosis of diabetes

Anangu adult tooth loss and missing teeth

Edentulism and missing teeth have been noted in the results reported so far. This early loss of teeth in the adult population is significantly related to having diabetes. Although not measured in this survey it is reported by NHC medical staff that nearly all anangu adults with diabetes in this population have poor glycaemic control (uncontrolled diabetes). It would seem that this combination of poor glycaemic control and poor oral hygiene is causing an epidemic of tooth loss amongst anangu adults with diabetes.

The mean number of 0.95 teeth are extracted due to advanced periodontal disease per attendance for dental care for anangu adults with diabetes.
Figure 5 shows these significant correlations with mean 8.29 missing teeth for all (including edentulous) anangu adults with diabetes compared with mean 1.53 missing teeth non diabetic anangu (P<0.000 Anova test). Amongst dentate anangu adults with diabetes mean 5.51 missing teeth compared with mean 1.72 missing teeth for non diabetic anangu adults (P<0.000 Anova test) is also significant.

DISCUSSION

Anangu child oral health

Younger anangu children are shown to have a prevalence of dental caries more than twice the Australian average in the deciduous dentition and the same as the national average for permanent teeth. Whilst caries incidence has shown a consistent decline over the past 20 years for most Australian children the trend in this population is shown to be increasing dental caries experience. Dental caries is a dietary carbohydrate and saliva modified bacterial infectious disease. The susceptibility of tooth surfaces to plaque acid demineralisation is modified by fluoride in a number of recognised ways, most significantly in this population the fluoride incorporated into tooth mineral structure. Dental caries prevention is achievable with fluoride and other strategies such as fissure sealants and dietary modification to restrict cariogenic foods.

All communities source their reticulated water from bores and groundwater mineral content and quality varies at different sites. A recent study (Fitzgerald J et al 1999) of the groundwater reported “About a quarter of the water bores in the AP Lands (32 out
of 129) meet all the requirements of the Australian Drinking Water Guidelines (ADWG)\textsuperscript{10} and elevated concentrations of fluoride in some groundwaters. They report that 50.4\% water supplies exceed 1.5 mg/L fluoride concentration and 4 of these water bores had fluoride concentrations of 3–4 mg/L. A further 2 sites exceeded 4 mg/L fluoride concentration:

The ADWG value for fluoride in drinking water is 1.5 mg/L and a concentration of 1 mg/L is recommended for optimal protection against dental caries (ADWG 1996)\textsuperscript{23}. At concentrations exceeding 2 mg/L, some dental fluorosis is likely to be apparent where the groundwater is the principal source of fluid intake. Skeletal fluorosis is likely to be of concern for fluoride levels greater than 4 mg/L. In hot, arid climates, total fluoride intake may be excessive even if the water conforms to the guideline value of 1.5 mg/L. (Fitzgerald J et al 1999, p 17)

The dental literature recommends that the optimal fluoride concentration for protection against dental caries should be around (varying with temperature and fluid consumption) 1 mg/L concentration if dental fluorosis (briefly, mottling from white flecks (mild) to more brown staining and pitting (severe)) is to be avoided especially where fluoride toothpaste is used widely by the child population. This survey has recorded fluorosis scores for the second half of the survey period and analysis of these findings will be undertaken in the future to correlate with the reported fluoride concentrations. However, dental fluorosis appears widely evident from mild to severe. Variations in the fluoride content of fluids and beverages consumed by anangu depend on rainwater tank usage (unknown but possibly minimal and intermittent), tea consumption (a fluoride-containing beverage) and non local sources of bottled drinks (soft drinks and mineral waters).

Changes in child caries experience in this population reflect increasing consumption of sugar containing foods and acidic beverages (soft drinks). Average consumption of sugar containing foods (UPK nutrition survey, 1988) has been estimated to be very high and therefore children are at high risk of dental caries. The changes in anangu children’s diet that predisposes to dental caries are also similar to the dietary contribution to adult onset diabetes (NIDDM). We believe that the anangu child dental caries experience is significantly modified by the high concentrations of fluoride in reticulated groundwater. This results in the permanent teeth with almost no smooth surface dental caries (the non-biting tooth surfaces) and the fissures surfaces of the permanent teeth as the sites of caries initiation. The preventive measure of sealing the newly erupted tooth fissure system with a resin or other dental material is a well recognised primary prevention intervention for tooth decay. This years survey reports that 43.3\% (cf 33.4\% of Australian 1996\textsuperscript{15}) of 9 year old and 27.9\% (cf 38.4\% 1996\textsuperscript{15}) of 12 year old anangu children have fissure sealants present on permanent teeth. This is an indication of some success of the NHC school dental program in the prevention of child dental caries. A further 298 fissure sealants were placed during the year to continue this strategy to prevent dental caries in the permanent teeth.

Regular effective toothbrushing is necessary for control of gingivitis. Toothbrushing is not widely practiced within these communities. There is little evidence of traditional cultural practices that were similar to oral hygiene activity. The authors (CE and SW) have observed that school-based daily toothbrushing routines appear to demonstrate improved gingival health. No correlations between gingival health and presence or absence of toothbrushing practices have been attempted in this report. It is anticipated that this will be correlated in the future.
Anangu adult oral health

Reports of higher rates of edentulism amongst Indigenous Australians reflect the poor outcomes of oral health measures for this population of Australians. This survey of anangu adult oral health presents lower overall edentulism (10.5% cf. 14.1% 45–64 year-olds, and 2.88% cf. 16.3% overall) than other Indigenous Australians, however the change in this population from no recorded edentulism in 1997 to 2.88% (all adults) in 2000 reflects a significant change in oral health outcomes for anangu.

Total tooth loss is a failure of oral health measures to maintain a functioning dentition. It is generally recognised that tooth loss from dental caries reflects poor access to oral health care. Tooth loss from periodontal disease is also usually recognised as preventable with access to appropriate periodontal therapy, however this requires significant ongoing commitment from both patients and dentist/hygienist to achieve. This will be even more problematic in these populations with diabetes and periodontal disease association.

This survey reports a significant change for anangu adults in the last 15 years from dentate and mostly functional (mean DMFT 1987) to rapid tooth loss (mean DMFT 2000 and 2.88% edentulous) and loss of masticatory function (ability to chew effectively). This tooth loss is associated with a diagnosis of diabetes (mean missing teeth 8.29 diabetes cf. 1.53 no diabetes, p<0.000) with all edentulous adults also having diabetes diagnosis (10.53% of adult anangu with diabetes are edentulous).

The trends in oral health for Australian adults have improved with dramatic declines in edentulism (age 65 years and older 66% in 1979, 50% 1987/88, 40% 1994)³. Our findings report an opposite and more dramatic rise in total tooth loss (age 65 years and older from 0 to 12.5%).

The rapid loss of teeth in middle age for anangu with diabetes in the past 15 years is of alarming proportion (average nearly 1 tooth extraction per visit for adults with diabetes). The pathogenesis of periodontal diseases for anangu adults with diabetes is devastating. From a functional oral health at age 18–24 years (mean DMFT 3.64%, Decay 1.45% and mild reversible gingivitis with calculus 91.3%) a diagnosis of NIDDM between the age 25–44 years results in recurring acute periodontal abscesses, rapid development of periodontal pockets, loss of periodontal support (alveolar bone and periodontium), mobile (loose) and then loss of teeth. We estimate that tooth loss from periodontal diseases in this population becomes substantial 5–10 years after diagnosis of diabetes and with poor glycaemic control it appears that restoring periodontal health is not achievable at present. The result is of an inevitable continuing tooth loss, recurrent episodic acute infections and a chronic suppurating “gingival wound” of sizeable proportion. Chewing is extremely compromised during this period of “periodontal decay” which is particularly significant for anangu with diabetes who are advised to modify diet (eat more fruit, vegetables and reduce saturated fats) loose weight and increase exercise.
CONCLUSION

Gum diseases (periodontal diseases) in anangu adults and children are of significant prevalence. The widespread morbidity (episodic pain, recurring acute infection, early tooth loss, difficulty chewing) from periodontal disease in adults with NIDDM is profound.

Periodontal diseases need to be more widely recognised as a complication of NIDDM especially with poor glycaemic control. Further investigation and analysis of the relationship between NIDDM, glycaemic control and periodontal diseases in Indigenous populations needs to be undertaken.

This epidemic of adult tooth loss begs the attention of the researchers, policy makers and service providers of Indigenous health. Efforts to reduce morbidity and modify the outcomes of the diabetes/periodontal disease relationship would require assistance from specialists in both these fields. Clearly there are implications for understanding the oral health of other populations of Indigenous Australians. A recent review (Martin-Iverson et al 2000) of Indigenous Australian dental health concludes that development of appropriate mechanisms to address the oral health needs of this group of Australians should receive priority.

Promoting effective oral hygiene practices, most significantly toothbrushing habits, have not to date become widely incorporated into daily personal care practice. It indicates a need to develop the appropriate strategies and vehicles for promoting these essential routines for changes in child gingivitis prevalence and adult periodontal health. School-based toothbrushing and personal care programs need to be enhanced to develop adequate hygiene habits. Further development of school screening, early intervention and preventive strategies should not be neglected.

The need to develop health promotion strategies for improving diabetes and cardiovascular disease risk factors has been evident for some time. Oral health promotion is integral to these issues and continuing to develop oral health programs and strategies a priority.

There are significant self-esteem, cultural perceptions and other psychosocial implications of premature tooth loss. For a culture with no previous experience of edentulism and the difficulties of adapting to use of dentures the effect of these changes to oral health are profound.

Understanding disease patterns and morbidity should inform our priorities and agenda for developing a responsive health system. Oral health is an important part of everyone’s well-being. We wake this sleeping issue in the picture of health for Indigenous Australians.
REFERENCES


19. Central Australian Rural Practitioners Association (CARPA)

20. High prevalence of obesity and diabetes in an Aboriginal population despite relatively recent European contact (unpublished results from Surveys in 1990–91)


AUTHORS

Colin Endean began working for Anangu in 1985, as the Nganampa Health Council Dental Program commenced, after graduating with a dental degree in 1982. The next 5 years of working as the wandering dentist was equally education and experience. Finding a large undiagnosed diabetic population attending with periodontal diseases lead Colin to co-ordinating a non-communicable disease project: “Mai Wiru, diabetes a chance for change”. After moving to Adelaide with a young family Colin became a manager for the South Australian Dental Service (SADS) at the Parks Community Health Centre, then District Dentist in the Clare region of country South Australia. He is now head of the Dental Unit at the Flinders Medical Centre (FMC). Colin returned to work for Anangu for locum dental visits in 1994 and 1996, and for further part-time involvement until 1999 as part of a small team of dentists committed to developing the dental service into an Oral Health Program. Taking a year’s leave from FMC and SADS in 2000, Colin undertook the development of the NHC Oral Health Program and collected the survey data that is presented at this Conference. Colin is a founding member of the newly formed Remote Oral Health Practitioners Association.