



Fighting disease with fruit



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Aboriginal health finally became a major political issue during 2007, having been seen as a public health crisis for many years. This article is presented both as a reminder of the power of simple nutritional interventions to improve health, and also of the great medical research tradition of general practitioners being curious about the health benefits they can bring to their communities through health advocacy, community mindedness and common sense.

Steve Tumble, Editor in Chief, *Australian Family Physician*

Otitis media and chronic suppurative otitis media are common conditions in Aboriginal communities,¹ and are associated with poor nutrition, overcrowding and passive smoking.² This article reports on an extension of our nutrition program, which was first reported in *Australian Family Physician* under the title 'Are there health benefits from improving basic nutrition in a remote Aboriginal community?'³

Our original research project was conducted in response to a need identified by the Aboriginal Medical Service servicing a remote Aboriginal community with high rates of otitis media and skin infections among 15 children attending the local primary school. These infections were not responding to more traditional approaches such as antibiotics and referral to ear, nose and throat specialists for treatment. We found that supplementation of the students' diet with fresh fruit led to a decrease in prescription of antibiotics for staphylococcal skin infections and otitis media. Students were given a fruit platter with the recommended intake of at least one piece of fruit per student each school day. Of the 12 students who underwent pre- and post-hearing tests, 5/12 (42%) experienced improved levels of hearing after 6 months of the intervention. Although our study was small, unblinded and uncontrolled, our observations encouraged us to persevere.

We have continued to provide fresh fruit to the students at this primary school for the past 3 years.

Blood tests performed in 2006 on all nine students in attendance that day showed that the average vitamin C level was 41.7 µmol/L compared with an average level of 21.9 µmol/L when 11 students were tested almost 3 years earlier. Four of the nine students (44%) were in the normal range for vitamin C (40–100 µmol/L), whereas 11/11 (100%) were deficient in vitamin C before the intervention commenced. Due to the transience of the community, only two students underwent both pre- and post-blood tests.

Hearing was tested in late 2003 (immediately before the introduction of fruit), 6 months later in mid 2004, and again in mid 2006. At baseline only 5/12 (42%) students had normal hearing. There was a substantial improvement in hearing after 6 months of the intervention and 9/11 (82%) students had normal hearing 2.5 years into the intervention. All of the students present on the day were tested on each occasion. Five of the students whose hearing was tested on 30 May 2006 were part of the original cohort tested on 25 November 2003.

Due to our observations of dramatic improvement in the children's health with better nutrition, since June 2004 we have employed a full time dietician. The dietician runs a cooking program with the students with an emphasis on healthy recipes that incorporate vegetables from the school garden. A separate healthy cooking program is run for their parents, who also contribute to the school garden.

The program has also been extended to families of other Aboriginal communities. Families pay \$5 per week to receive \$40 worth of home delivered fresh fruit and vegetables. The \$35 difference is subsidised by the Aboriginal Medical Service from a grant. The families targeted are those with children who repeatedly present to the service with skin and ear infections.

In order to further elucidate how best to target our simple nutritional intervention, we examined Aboriginal students in another community that we service. This is a coastal community with a good range of grocery shops. Pre-intervention blood samples were obtained from 27 students: 23 local primary school students and four children attending a playgroup. Fifteen of these children were chosen for the fruit and vegetable delivery program because of their repeated skin and ear infections. The remaining 12 children are not participating in the program.

Initial results revealed that 7/27 (26%) students were deficient in vitamin C. Of these, 6/15 (40%) students who are now on the program, were deficient in vitamin C

compared with only 1/12 (8%) students not on the program.

Overall 20/27 (74%) children in this second community had at least one abnormal parameter in their iron studies, indicating iron deficiency. Of the children we selected to join the nutrition program, 15/15 (100%) were iron deficient compared to 4/12 (33%) students who were not selected to join the program. Children were selected to participate in the program based on their clinical presentation. The vitamin C and iron blood test results reinforce that the children we chose – based on high rates of skin and ear infections – also had the highest rates of nutritional deficiencies.

Screening of the eight children at the playgroup showed that six had skin infections (75%), compared with only 1/5 (20%) children at repeat examination after 7 months on the nutrition program. Otoscopy revealed that 3/8 (38%) of these children had active ear infections and 2/8 (25%) had normal eardrums. At follow up 7 months later, 4/5 (80%) children had normal eardrums.

The transient nature of the Aboriginal communities studied and the small number of children who participated (as well as the uncontrolled and unblinded nature of our observations) means that we cannot be certain that the improvements in the children's health is only due to their improved eating habits. However, it adds further weight to our original research article. The significant improvements in the health of these Aboriginal communities since the introduction of the nutrition program means we now see preventive health programs as a major initiative for our medical service and Aboriginal health in general.

Conflict of interest: none declared.

References

1. Coates H, Morris P, Leach A, Couzos S. Otitis media in Aboriginal children: tackling a major health problem. *Med J Aust* 2002;177:177–8.
2. Couzos S, Metcalf S, Murray R of the National Aboriginal Community Controlled Health Organisation (NACCHO). Systematic review of existing evidence and primary care guidelines on the management of otitis media in Aboriginal and Torres Strait Islander Health, 2001. In: Coates H, Morris P, Leach A, Couzos S. Otitis media in Aboriginal children: tackling a major health problem. *Med J Aust* 2002;177:177–8.
3. Jones R, Smith F. Are there health benefits from improving basic nutrition in a remote Aboriginal community? *Aust Fam Physician* 2006;35:453–4.

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