



Are there health benefits from improving basic nutrition in a remote Aboriginal community?

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BACKGROUND

Otitis media, chronic suppurative otitis media, and skin infections are common in many Aboriginal communities.

METHOD

Primary school students in a remote Aboriginal community were examined by blood testing. Audiometry was compared before and 6 months after children were provided with fresh fruit each school day, as were rates of skin infections, and the prescription of antibiotics for otitis media and skin infections.

RESULTS

All 12 students who completed both points of hearing testing had slight or greater hearing loss at baseline. Five had improved hearing at 6 months and seven (58%) had no change. Mean antibiotic prescriptions decreased from seven to 1 per month. All 15 tested had low serum vitamin C concentrations and 11 had abnormal iron studies, suggesting their poor health might be caused by poor nutrition.

DISCUSSION

Although many other factors may have contributed to the improvements, the results suggest nutrition as a possible factor for poor health outcomes in remote Aboriginal communities, which could be easily overcome. A randomised trial should be conducted.

Otitis media, chronic suppurative otitis media, and skin infections are common in many Aboriginal communities.^{1,2} Several effective strategies include improving nutrition, decreasing overcrowding and reducing passive smoking.³

We report our experience from a rural New South Wales Aboriginal community 80 km from the nearest shop, which limits the availability of fresh produce. General practitioners from the local Aboriginal medical service observed high rates of skin infections and recurrent otitis media on regular fortnightly clinic visits. Teachers routinely amplified themselves in the classroom, which has a totally Aboriginal population of 15–20 students enrolled at any time, from kindergarten to year 6.

Method

We investigated poor nutrition as a possible contributing cause, and speculated whether treating this might help. On every school day, we provided students with 1.4 g powdered vitamin C and mineral supplements dissolved in apple juice. However, the students disliked this.

We noticed that they liked fresh fruit (including citrus, apples, bananas and pineapple), although it was observed that students rarely brought any in their lunchboxes. Accordingly we provided fresh fruit once or twice per school day, at morning tea and lunch time, supervised by teachers, as an intervention.

We tested blood samples from 15 students in September 2003 for haematology, vitamin C levels, and iron studies.

Audiometry was conducted by the Royal Deaf and Blind Society, which measured hearing loss in each ear at 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz. This was conducted before introducing the nutrition program and repeated 6 months after providing the fresh fruit. Audiometry results were categorised according to the American Speech Language Hearing Association criteria.

Parents or guardians provided informed consent for their children to participate in this study.

The project was approved by the Ethics Committee of the Aboriginal Health and Medical Research Council, Australia.

Results

All subjects had low (below 40 µmol/L) serum vitamin C levels, and 11 had abnormal iron studies, suggesting iron deficiency (three had anaemia). Before the intervention, a quarter of the children at the primary school had infected skin lesions (especially impetigo) and an average of seven prescriptions for antibiotics were written per month. Half the children had some form of middle ear infection, and all 12 experienced hearing loss rated as slight or greater, in at least one ear.

After introducing fresh fruit, antibiotic prescriptions decreased to an average of one per month and five students (42%) experienced improved levels of hearing by one or more classification levels (the remainder stayed at the same classification). Teachers abandoned voice amplification.

Discussion

Noncompliance with prescribed antibiotics for skin and middle ear infections may have first caused the failure of the conventional treatments. However, we were struck by the students' poor eating habits, with lunchboxes usually containing highly processed foods such as potato crisps, chocolate bars, meat pies, pizzas and soft drink. The low serum vitamin C levels were also supportive of poor nutritional choices. Vitamin C enhances nonhaeme iron absorption, so iron status may have improved postintervention, although for ethical reasons we could not repeat the blood tests.

Can we attribute the health improvements to the nutritional intervention? Many other factors may have contributed. However, there was no change in medical treatments such as insertion of grommets, increased compliance with antibiotics, or concurrent community programs addressing infection rates during the intervention period, nor were there any changes in the school or Aboriginal medical service staff. A randomised trial would answer the question.

Implications for general practice

- Nutritional deficiencies may be contributing to health problems among some Aboriginal children.
- This small uncontrolled study, in which

fresh fruit was introduced, found that health improved along several parameters.

- The study was small and uncontrolled.
- It needs a randomised controlled trial to answer the question.

Conflict of interest: none declared.

Acknowledgments

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