Reviewer's report

Title: High burden of otitis media in Aboriginal and non-Aboriginal children and otitis media in Aboriginal children predicted by failed otoacoustic emissions: a birth cohort study in an arid zone of Western Australia

Version: 1 Date: 26 March 2008

Reviewer: Mark Haggard

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Background and declaration of interest

This is a solid and potentially interesting piece of work from a respected team who have done much for Aboriginal health and made a genuine research contribution as well. I have met several of its members at international meetings mostly > 5 years ago, but do not know any particularly well and have had no collaborations: equally our main objectives differ so there would be no rivalry.

Overall strategic alignment with Arch Dis Ch and publication priority

Some of the lessons here generalise to other aspects of health and other indigenous peoples. Whilst not to be overplayed, this can be mentioned and constitutes some claim on journal space.

However the word “and” in a title usually worries me, as a marker of failure to think through and express what the specific relationship is between the two things or concepts (A, B) linked by the “and”, or possibly a search for two reasons where a single one is not important enough. Its occurrence in the title suggests a weakness at the heart of the rationale. Is that weakness real?

There is a well known high burden of ear disease in Aboriginal populations and a definite literature. Does this work add precision, generality, variety to profile, detail to profile, specific predictive risk factors, or pathogenetic explanation? For publication in Arch Dis Ch one would wish to see a clear claim on this as justification for submission, and this being largely borne out by findings. I do not see such claim or findings. In any revision this is the aspect that is indeed a priority peg to hang the work on, but background and should be played down and left out of the title, thus getting rid of the liability in the “and”.

It is well known that the otoacoustic emission technique (OAE) is sensitive to fluid in the middle ear as well as to malfunction of the inner-ear hair cells (PCHI). It is known but less widely appreciated that, given the difficulties over non-standard (high-frequency) tympanometry, if it is appropriate from a public health (PH) point of view that a screen for otitis media and/or inner-ear hearing loss be carried out in the very young (say below 1 year), then OAE becomes consequently a more suitable technique than tympanometry. This could be more succinctly and clearly stated than it is, but as a justification it is implicit and correct. Stating this
explicitly. is important because since discovery of OAE over a quarter of a century ago, and particularly since instrumentation became available in the late 80s there have been far too many mindless studies pointing OAE at ever phenomenon under the sun without good appreciation either of the pathophysiology on which the technique rests or the PH and diagnostic issues in the application.

The problem then divides into two sub-problems. Is a screen so early merited overall on PH grounds? There is not a large evidence base on this question specific to aboriginals, but I am prepared to accept an a priori epidemiological case that where a rural setting with scattered population does not permit universal neonatal screening in large concentrated maternity units, a combined screen for OM and PCHI a bit later in the first year is a sensible proposition. The idea of combination points directly to use of OAE, but of course a clinical pathway with a diagnostic test potentially dividing into 2 distinct paths. Again, this could be more succinctly and clearly stated than it is.

The second sub-problem is the evaluation of a field model for a real-world screen, which is broad and pragmatic (perhaps including total service costings) and how far towards that the present work goes. The Conclusions recommend precisely such a thing, but also contain some statements about the capital costs (only) of different equipments. These should not be in the Conclusions but in the background justification for the work. The nature and magnitude of the step that has been made by the present study towards the recommended wider evaluation is not the subject of a very clear claim. It does not seem to be the operational validation of a technology (for which there is not much need, anyway). Rather it seems to be a documentation of the yield, acknowledged to be less than in some other Aboriginal populations (or at least studies), but material nevertheless. Yield is a sort of mixture of condition prevalence as a policy issue and the reasonably assumed sensitivity of the technique. This has an aspect differential (Table 3) between the Aboriginal and other population, with the main difference being in OME found and in perforations – two things which don’t particularly go together in Western populations but do more strongly here, but this does not seem to be particularly new. There is apparently an interesting cross-over whereby the hazard ratio (the legend to Table 4, should re-state for what) is higher in the very youngest of non-aboriginals but reverts later to having the expected higher value in aboriginals. The implication of this may be that for the aboriginal population a very early screen is unsuitable. However we are not given the appropriate test for an interaction with age (is the age-difference in HR itself significant – statistical advice needed here on whether to test for the interaction in the logistic with a continuous or dichotomised age – I would start by doing continuous for scientific power and only dichotomise for representation and optimal action). This crossover idea only makes it into the conclusions in a very partial and implicit way via an absolute statement about screening at later age.

Recommendation

I would be very prepared to more detailed work on points in the text of a resubmission but this is premature and would not be a good use of time. The
authors need to decide more clearly what are the few most important ideas their results most directly speak to and to re-submit a shortened and conceptually clarified version. They should in this be mindful throughout of what would go in the traditional “BMJ Boxes”. (What was known on this topic, what this study adds.) The introduction should succinctly cover the first of these and address the PH desirability, potential health-technology promise etc of the second, and then clearly list the questions that the results (may) answer. There are too many cathedratic professional opinion statements about need. I don’t disagree that there are needs, but these need to be converted into statements of morbidity, prevalence, severity and consequences, and potential for cost-effective treatment or secondary prevention.

Middle-level point

The recommendations for research are sensible but far too long and too broad for the main material of the article, unnecessarily adding to the impression of clutter. Failure of 7-valent pneumococcal vaccination to remedy the OM problems of Aborigines is an important point, but it should go only briefly in the introduction as a strategic justification of the continuing relevance of screening-treatment approach, as the substance of the article is not bacteriological.