Does nose blowing improve hearing in serous otitis? A community study

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SUMMARY. Otitis media with serous effusion (glue ear) is one of the most common problems seen by family doctors. In order to evaluate the effect of regular nose blowing on the resolution of serous otitis a randomized trial was carried out in a community health audiology department in Oxfordshire over the period 1983–87. A total of 84 children aged three and a half to four and a half years, found to have a conductive hearing loss owing to serous otitis were included in the study. The hearing test combined a discrimination test of seven named toys and full audiometry with earphones. The children's ears were examined by otoscope and Rinne's tuning fork test was performed. Randomly selected children were advised to blow their noses or were given no advice. The children were retested two months later and the outcome determined for children who were or were not given advice and who were or were not naturally good nose blowers. A record was made of any surgical intervention by insertion of ventilating tubes carried out before the children started school and of the results of the children's routine hearing tests on school entry. No significant differences in the proportion of children passing the second hearing test were found between children advised to blow their noses and those given no advice or between those children who were naturally good at nose blowing and those who were not. Neither was there any association between the proportion of children passing the school audiometry test and nose blowing advice being given, nose blowing ability or surgical intervention. However, more good nose blowers passed the second hearing test than poor nose blowers and further studies with larger numbers of children might produce significant results.

Introduction

Otitis media with serous effusion (glue ear) is one of the most common problems seen by family doctors. Maw found that 40% of cases were unresolved after three years and 25% unresolved after five years.[1] Chalmers and colleagues summarize various results, mostly from countries in temperate zones; they report that in 9.5% to 32% of children with chronic serous otitis the condition lasts for 12 weeks and in 2.3% to 10% for between one and four years.[2] Their own prevalence rates were comparable and showed a decline in children aged six to seven years. In an interesting study from Kuwait, which has a desert climate, Holmquist and colleagues found a prevalence rate of 12.2% among children aged seven to nine and a half years in the winter months.[3] Shurin and colleagues have expressed concern at the possible effect on a child's cognitive development[4] while Lous and Fiellau-Nikolajsen report recurrence of acute otitis media in one third of children with persisting effusion.[5]

Many treatments of serous otitis have been tried. These vary from decongestants through antibiotics to adenoidectomy and insertion of ventilating tubes. Luntz and Sade have studied the use of aeration by politzerization (forcible introduction of air into the middle ear through the nose via the eustachian tube) in cases of atelectasis of the middle ear in adults.[6] They found that there was no lasting effect and that after a short time the eardrums returned to their original retracted positions. Chan and colleagues studied the autoinflation of the eustachian tube in young children using a modified valsalva technique with a mask.[7,8] The children were asked to exhale forcibly through the nostrils keeping the mouth closed which seems a difficult exercise for children as young as three years. No beneficial effects were demonstrated. Buckingham demonstrates a paradox.[9] He states that if sniffing produces a negative middle ear pressure, then the eustachian tube must be patent.

It is possible that by regular nose blowing serous otitis would eventually resolve by aeration of the middle ear through the eustachian tube. However, little research has been done into the benefits of trying to get children to blow their noses regularly. The aim of this study was to evaluate the effect of regular nose blowing on the resolution of serous otitis media.

Method

The study was carried out by a team from the community health audiology department in Oxfordshire. General practitioners, health visitors, speech therapists and clinical medical officers refer children to the department for a hearing test. Those children aged three and a half to four and a half years found by one tester to have a conductive hearing loss owing to serous otitis in one or both ears over the period 1983–87 were included in the study.

The test procedure comprised a word discrimination named seven toy test at three metres without face pattern together with pure tone audiometry at six frequencies (250, 500, 1000, 2000, 4000 and 8000 Hz). A response at less than 25 dB was taken to be a pass while a lack of response at 25 dB or above on any frequency was considered to be a failure. The children's ears were examined with an otoscope, and Rinne's test using a tuning fork was carried out.

Following failure at this first test and the diagnosis of a conductive hearing loss with glue ear, the tester opened an envelope containing one of two randomly selected advice strategies. Under the first of these strategies, the children were to blow their noses as advised while under the second no mention of nose blowing was made. Those children selected to blow their noses were shown how to do this — through one nostril at a time, to be followed by a drink. They were told to blow their noses in this manner at least once a day. It was explained to all parents that many children with this condition recover spontaneously and that a retest was advised in two months. Parents were advised to visit their doctor in the usual way should an acute infection occur before the second test was carried out.

The second test was identical to the first but was performed by a second tester who had no knowledge of the results of the first test, nor of whether any advice had been given.

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Submitted: 5 June 1990; accepted: 6 November 1990.

Following the examination, the second tester asked the parents about the children's ability to blow their noses, and this was demonstrated. She noted if the children were able to blow their noses well, and at this stage the parents mentioned whether this had been recommended by the first tester. If children failed the second test they were referred to their general practitioner in the usual way.

A record was made of any surgical intervention with ventilating tubes that had been carried out before the children started school and this was analysed in relation to the results of the audiometry test on starting school. Details of surgical intervention were obtained from the ear, nose and throat departments at the local hospitals. School audiometry is performed when children are five or six years old using pure tones at six frequencies (250, 500, 1000, 2000, 4000 and 8000 Hz). A response at 20 dB is taken to be a pass. Some of the children who failed the test or gave unreliable results were tested twice. Children were considered to have passed if they satisfied the tester at either the first or second attempt.

All statistical analyses were based on chi square tests.

Results

The first tester found that 84 children had a conductive hearing loss owing to serous otitis in one or both ears. Three children were not retested as one was found to be too unreliable and two were referred to an ear, nose and throat department before the second test. Therefore, a total of 81 children were retested.

Of the 81 children who were retested 42 received advice to blow their noses and 39 received no such advice. There was no significant association between advice on nose blowing and passing or failing the subsequent hearing test (Table 1).

A total of 80 children were assessed for nose blowing ability (data were unavailable for one of the children who had been given nose blowing advice). Forty five children were observed to be good nose blowers and 35 to be poor nose blowers. Although more good nose blowers passed the second test than poor nose blowers, there was no significant difference between the results (Table 1). In addition, there were no significant differences between the results for good nose blowers who had or had not received nose blowing advice or for poor nose blowers who had or had not received advice (Table 1).

Records of surgical interventions and school audiometry results were traced for 73 of the 81 children who received the second hearing test. Thirteen children had received surgical intervention with ventilating tubes before starting school. A higher proportion of the children who had not received surgical intervention passed the school test than of those who had had surgery (Table 2). However, this difference was not significant. The results of the school entry test could be compared with whether nose blowing advice was given and nose blowing ability for 70 children (Table 2). There were no statistically significant differences between any of these results.

Table 1. Proportion of children passing and failing the second hearing test according to whether or not they were given advice to blow their nose and whether or not they were good nose blowers.

	No. of children	Percentage of children: Passing test	Percentage of children: Failing test
All	81	*41*	*59*
Given advice	42	*40*	*60*
Good nose blowers	26	*42*	*58*
Poor nose blowers	15	*40*	*60*
Not given advice	39	*41*	*59*
Good nose blowers	19	*53*	*47*
Poor nose blowers	20	*30*	*70*

Table 2. Proportion of children passing and failing the school audiometry test according to whether or not they had received surgical intervention, were given nose blowing advice and were good nose blowers.

	No. of children	Percentage of children: Passing school test	Percentage of children: Failing school test
Received surgical intervention	13	*77*	*23*
No surgical intervention	60	*82*	*18*
Given advice	35	*89*	*11*
Not given advice	35	*77*	*23*
Good nose blowers	38	*87*	*13*
Poor nose blowers	32	*78*	*22*

Discussion

This study failed to show any benefit from nose blowing for children with serous otitis. In addition, surgical intervention with ventilating tubes before the children started school was not found to affect the outcome of hearing tests at school entry.

It was found that the discrimination and audiometry test results corresponded well. The Rinne test was surprisingly reliable given that Capper found that young children showed poor sensitivity to tuning forks.[10] He found the best test to be a combination of whispered voice and pure tones as used in this study. Maw advises audiometry and carefully performed whispered voice tests.[11] Tympanometry was considered for this study but rejected because what the children could actually hear was of prime importance and was the reason for their referral.

It was important to avoid contact between the children in the study as parents and older siblings would be likely to discuss with each other the advice given and thus invalidate the trial. To this end, the tests were carried out over a wide geographical area. If children were seen at a health centre, the other children attending were unlikely to be of the same age. Opportunities for communication were thus virtually eliminated.

Wanatabe and Okubo have found that eustachian tube function changes when children are about 10 years old.[12] Their study of children aged four to six years, showed that only 60% of children had a positive opening rate on swallowing, and that the eustachian tubes were open for a shorter time than in normal adults. They advise that the simplest treatment for serous otitis media is inflation of the middle ear via the eustachian tube but that children frequently resist this treatment. As Gellis states, when commenting on the work of Chan,[7,8] 'we are still left with a prayer or tubes'.[13]

Although the study failed statistically to show any benefit from nose blowing, it was noted that more good nose blowers passed the second test than poor nose blowers. The authors feel that this is because the study covered a relatively small number of children (81) and suggest that further studies should include a larger number.

Previous informal data collected by one of the authors showed that of 97 children of similar age who passed their hearing test first time, 85% were naturally good nose blowers and therefore able to aerate the middle ear. This clinical experience led to the setting up of this study.

Despite the results, the authors still believe that many children with unresolved glue ear are unable to blow their noses easily and effectively and therefore unable to aerate the middle ear.

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Acknowledgements

Sheila Hutchings' work was undertaken by a grant from the Central Oxford Research Committee. We thank the Oxfordshire school audiometricians for their results of the school tests, the ENT department, Radcliffe Infirmary for access to their records, Aidan Macfarlane for his encouragement and help and June Scanes for her work on the manuscript.

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