

The management of Otitis Media with Effusion in children with cleft palate (mOMEnt): a feasibility study and economic evaluation

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Disclaimer: this report contains transcripts of interviews conducted in the course of the research and contains language that may offend some readers.

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Scientific summary

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Scientific summary

Background

Cleft lip and palate are among the most common congenital malformations, with an overall incidence of around 1 in 700 individuals. Approximately 90% of children with cleft palate (CP) have a history of non-trivial otitis media with effusion (OME). OME ('glue ear') is the accumulation within the middle-ear space of a mucoid or serous fluid. Although the exact mechanism for the development of OME is not fully understood, dysfunction of the Eustachian tube connecting the middle-ear space to the postnasal space is thought to be of fundamental importance. The function of the Eustachian tube is to equalise pressure either side of the tympanic membrane, avoiding the development of negative pressure in the middle ear. In children, the Eustachian tube does not work as efficiently, with the resultant tendency towards the development of negative middle-ear pressure and the accumulation of fluid within the middle-ear space (OME). This tendency towards Eustachian tube dysfunction is further increased in children with CP due to dysfunction of the muscles originating from the palate which act to open the Eustachian tube orifice.

There are several approaches to the management of OME in children with clefts and they include watchful waiting, the provision of hearing aids (HAs) and the insertion of ventilation tubes (VTs). However, the evidence underpinning these strategies is not clear and there is a need to determine (i) the optimum study design to investigate which treatment is the most appropriate for children with CP; and (ii) whether or not the costs of running a trial are outweighed by the potential benefit of resulting information.

Objectives

- i. To identify current UK practice for the treatment of OME in children with CP.
- ii. To capture patient and parent opinions on willingness to take part in the trial and to identify their needs regarding the content and form of information required to make a decision on whether or not to participate.
- iii. To develop a core outcome set (COS) for use in future trials of OME in children with CP.
- iv. To evaluate if the extent of existing decision uncertainty about OME care for children with CP justifies the cost of further research.
- v. To determine feasibility and identify the optimum study design to add to knowledge about the treatment of OME in children with CP.

Methods

Clinician survey

A survey of current clinical practice for the treatment of OME in children with CP with or without cleft lip was carried out. This was directed at collecting information on the following main areas: (i) the method of provision of care; (ii) the clinical practice; and (iii) the caseload of patients. This was sent to the 16 UK cleft centres.

Qualitative research

A qualitative methodology was adopted to explore in depth (a) parents' views about their willingness for a child to take part in a potential trial comparing VTs and HAs, and (b) outcomes of OME management considered important by parents and children.

Parents were recruited from two cleft centres in northern England. They were eligible to take part if they had a non-syndromic child with CP (including cleft lip and palate) between 0 and 11 years of age, who had a current or past diagnosis of OME. Families with particularly difficult social circumstances (e.g. domestic violence, recent bereavement) were not approached. Children aged 6–11 years were interviewed, if they were happy to talk to the researcher. Data collection continued until the sample was diverse in terms of the children's age, gender and type of treatment received for OME, and it was judged that data saturation had been reached.

Interviews were recorded with parents' consent and transcribed verbatim for analysis, with identifying features removed during this process (including names of health-care professionals). The data were analysed using framework analysis.

Development of a core outcome set

This involved the following stages: (i) a systematic review of the literature to identify a list of outcomes previously reported in studies of the treatment of OME in children with CP; (ii) a Delphi exercise to gather information on the outcomes of importance to health professionals; (iii) an online survey of parents and children with CP; and (iv) a consensus meeting.

The search strategy was applied to the Cochrane Central Register of Controlled Trials (CENTRAL), EMBASE, MEDLINE, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (January 2006 to April 2011).

Multiple databases were utilised to maximise the sensitivity of the search. CENTRAL comprises only studies that are deemed to be controlled trials by a team of reviewers. EMBASE, MEDLINE and CINAHL include published research of various study designs. The advantages conferred by using CENTRAL in addition to the other databases are that trials from other sources of research (e.g. journals not indexed in MEDLINE and conference proceedings) are hand-searched, and controlled trials from these are included. This improves the chances of identifying all relevant studies.

Economic analysis

This involved the following stages:

- i. A systematic search of the literature was conducted to identify published decision-analytic model-based economic evaluations of treatment options for the management of OME in children with CP. The search strategy was designed to retrieve relevant studies from MEDLINE, EMBASE and the American Economic Association's electronic bibliography. These databases were searched from the date of their inception to January 2014.
- ii. A de novo economic model was structured and populated to estimate the incremental costs and quality-adjusted life-years (QALYs) of four potential strategies for managing children with CP and OME.
- iii. Value of information analyses were performed to quantify the potential value of future research.

Results

Clinician survey

We identified lead clinicians for each of the 16 centres and received complete surveys from 10 (62%). Partial responses were received from 14 centres (87%). Two centres refused to complete any part of the survey. The survey revealed that most centres (12/13) have a 'hub-and-spoke' clinics infrastructure, with the number of 'spoke' clinics ranging from 2 to 14. In this method of delivery of care, patients are seen in the centre ('hub') by clinicians who decide on the optimum treatment. This is then delivered in

clinics/hospitals that are nearer the patient's home (spoke). The clinical practice showed adherence to the National Institute for Health and Care Excellence Guideline Development Group guidelines and practitioners prescribed both HAs and VTs. The information on caseload which we obtained was not accurate and this was supplemented from a centrally held database (Craniofacial Anomalies Network). This suggested that the caseload for each of the centres showed some uniformity, with most seeing between 35 and 60 new referrals per year. Three centres received between 90 and 130 referrals per year, and four had 35 or fewer referrals per year.

Qualitative research

Interviewees held strong opinions about treatment. Only 25% of parents were willing to enter their children into a trial. This reflected the fact that most parents were not in equipoise, and were concerned about specific risks or benefits of either VTs or HAs. Furthermore, parents required comprehensive and detailed information about HAs and VTs. In addition to information on safety procedures in a trial, the following appear to be important: a clear explanation of clinical equipoise; a need for the investigators to understand patients'/parents' previous experience of treatment (bearing in mind that the burden of care for a child with a cleft is very high); ensuring that the study is introduced by clinicians with whom the parent and child are familiar and trust; and highlighting how the study will enhance knowledge and help others in the future. Addressing these issues may optimise trial recruitment.

When we evaluated outcomes that were important to parents and children, we found that they stressed the significance of speech and language development, educational outcomes and establishing social networks. Their concerns were not solely related to hearing difficulties but were associated with having a cleft. As a result, although hearing was the key outcome, this was largely because of its consequences on social and educational development, and psychological well-being. Findings from this part of the project fed into the development of a COS.

Core outcome set

The systematic review of the literature identified 49 papers which were assessed for outcomes used. Outcomes were grouped into relevant domains and individual outcome and domain names were agreed with input from the Study Advisory Group. A final list of 45 individual outcomes, together with an additional four outcomes identified through free-text responses, were included in the Delphi. The scores provided in each round of the Delphi survey and the survey of parents and children were analysed against predefined consensus criteria. The results were then presented at a face-to-face consensus meeting attended by both health professionals and parents. At this meeting the delegates discussed and voted on whether or not the outcomes should be included in a COS. This resulted in nine outcomes being agreed for inclusion.

Economic analysis

There were limitations in the current evidence base for the management of OME in children with CP. When the treatment alternatives were considered, it appeared that the surgical insertion of VTs was likely to be the most cost-effective option, but the need for additional information from a future study is needed to inform this treatment choice. The expected value of perfect information was approximately £5.24M for a population of children with CP in England, Wales and Northern Ireland, assuming the willingness-to-pay threshold of £20,000 per QALY and a decision horizon of 10 years, suggesting that further research work in this area is potentially worthwhile. However, the expected value of partial perfect information analysis indicated significant uncertainty surrounding the estimates of hearing-level parameters used for quantifying the QALYs. Interpretation of this economic analysis should be undertaken with caution as, with no definitive guidelines identified for the treatment of OME in children, the clinical pathway used to structure the economic evaluation was developed using assumptions based on available published evidence.

Conclusions

There is a need for further study of the management of OME in children with CP. This research should be a randomised trial based in eight of the UK cleft centres. The trial should compare the effectiveness of VTs with that of HAs. Children will enter the trial when they are 2 years old and will be followed for 3 years. An initial calculation suggests that the trial should enrol a sample of at least 90 children. The outcomes should be based on the COS that has been developed, with a primary outcome of hearing. However, there is uncertainty about the required sample size and likely recruitment rate for a trial.

As a result, we recommend that additional data should be obtained from a note review of hospital records to inform the sample size calculation.

Concerns about recruitment rate could be addressed by designing a trial with an internal pilot. The aim of the internal pilot would be to check the recruitment rate and include a qualitative component to establish barriers to recruitment and optimise recruitment methods. For example, the qualitative component of our study suggested that parents were concerned about the safety of their child, were not in equipoise and were not clear on the relative risks and benefits of the potential interventions. Progression to the main trial would be reviewed at 6 months after recruitment has started.

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