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Should obtaining a preoperative audiogram before tympanostomy tube placement be used as a quality metric? A survey of pediatric otolaryngologists

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ABSTRACT

Introduction: Obtaining a preoperative audiogram prior to tympanostomy tube placement is recommended by the American Academy of Otolaryngology-Head and Neck Surgery clinical practice guideline (CPG): *Tympanostomy tubes in Children*, and this process measure is also used as a quality metric by payers. However, whether audiograms should be mandated in cases of tube placement for both chronic otitis media with effusion (COME) and recurrent acute otitis media (RAOM) is controversial. The objective of this study is to determine reports of practice patterns of pediatric otolaryngologists regarding obtaining audiograms before and after tympanostomy tube placement and opinions regarding utility of CPGs and use of this process measure as a quality metric.
Methods: A 16-question cross-sectional survey of American Society of Pediatric Otolaryngology (ASPO) members was conducted. Per ASPO policy, no repeated requests or other enhanced response techniques were permitted. Independent *t*-tests for proportions were used to compare responses.
Results: 127 pediatric otolaryngologists completed the survey (response rate 26.9%). Nearly 70% of respondents reported being in practice for >10 years. 74% of respondents reported obtaining preoperative audiograms "always" or "most of the time" for COME, vs. 56.7% for RAOM ($p < 0.0001$). 76% agreed that obtaining a preoperative audiogram was representative of high quality for COME, vs. 52% for RAOM ($p < 0.0001$). 12% of respondents "completely agreed" that compliance with all aspects of CPGs represented high quality, while 68.8% responded that they somewhat agreed.
Conclusion: There is no consensus among pediatric otolaryngologists regarding the necessity of a preoperative audiogram in tympanostomy tube placement, especially for RAOM. Further evidence demonstrating the benefit of preoperative audiogram obtainment should be developed prior to inclusion as a guideline recommendation and as a quality metric.

1. Introduction

Insurance companies often use guidelines from professional societies to rank physicians on the quality of care. Within otolaryngology, fourteen guidelines have been published, with two new guidelines and three updates to current guidelines in progress as of March 10, 2016 [1]. In 2006, the Massachusetts Group Insurance Commission (GIC), which provides insurance to over 420,000 state employees, retirees, and their dependents, began a tiering program, a patient cost-sharing variant of pay-for-performance. One of the GIC quality metrics requires obtainment of a preoperative audiogram for all cases of tympanostomy tube placement; this was developed based on the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) clinical practice guideline (CPG): *Tympanostomy tubes in Children* [2]. However, local practitioners have questioned this metric due to the different primary etiologies for tympanostomy tube placement for chronic otitis media with effusion (COME) vs. recurrent acute otitis media (RAOM)—hearing loss vs. improvement of symptoms of ear

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infections. However, there currently is no definitive evidence to suggest that preoperative audiogram before tube placement correlates with improved outcomes [3–5]. In addition, there exists some variability in audiogram results based on the quality of testing. These concerns have led to the question of whether or not this process measure should be used as a quality metric affecting reimbursement decisions.

In light of this controversy, we sought to determine if consensus exists among practitioners as to whether or not obtainment of a preoperative audiogram for tympanostomy tube placement reflects standard of care. Our objectives were 1) to identify clinical decision-making with regards to audiogram obtainment for tube placement in different clinical scenarios, and 2) to solicit opinions regarding use of this process measure as a quality metric, and general views on CPGs.

2. Methods

2.1. Survey administration

We developed an online survey to assess clinical decision-making with regards to obtaining an audiogram prior to tubes in different clinical scenarios, and to assess judgment about the use of this measure as a quality metric. We performed cognitive testing [6] of the original survey draft to determine the understanding of the intent of the questions among five pediatric otolaryngologists at the Massachusetts Eye and Ear Infirmary. The final instrument was a 16-question survey (Fig. 1) that was formatted for web-based administration (Research Electronic Data Capture, REDCap [7]). The survey had questions pertaining to three domains: clinical scenario management and audiogram obtainment, quality of care and guidelines, and demographics.

2.2. Questionnaire

2.2.1. Clinical scenario management and audiogram obtainment

The initial portion of the survey presented questions regarding management of COME and RAOM once criteria for tube placement have been met, as well as questions about obtaining pre- and postoperative audiograms. The clinical scenarios presented for COME and RAOM were created based on established definitions of each disease process [2], and respondents were given three options for management: observation, tube placement, or other.

For questions regarding frequency with which pre- and post-operative audiograms were obtained, the questionnaire offered five options from which to select: always, most of the time, sometimes, rarely, and never. Those who responded “always” or “most of the time” were categorized as “routinely” obtaining preoperative audiograms. Based on the responses to these questions, respondents were given five options from which to select why they would be more likely or and nine options from which to select why they would be less likely to order pre- and/or postoperative audiograms (Fig. 1), with the ability to select more than one.

2.2.2. Quality of care and guidelines

The second portion of the survey addressed the respondents' attitudes toward whether or not a preoperative audiogram prior to tube placement for either COME or RAOM represents high quality. Respondents were asked to select a response from a 4-point Likert scale (ranging from completely agree to completely disagree). In addition, this section asked about the respondents' familiarity with the Tympanostomy tube CPG [2] using a 4-point Likert scale (ranging from very familiar to not at all familiar). Lastly, respondents were asked about whether or not they felt that compliance with all aspects of CPGs represented high quality care using a 4-point Likert scale (ranging from completely agree to completely disagree).

2.3. Subject selection and administration

The final instrument was sent to the research committee of the American Society of Pediatric Otolaryngology (ASPO) for approval. Following approval, all ASPO members ($n = 471$) were sent an invitation by email from ASPO to complete the survey via REDCap [7] in March 2015 with a 3-week window for completion, indicating that the study was being conducted by academic pediatric otolaryngologists at the Massachusetts Eye and Ear Infirmary. Respondents were assured confidentiality of their answers. Per the ASPO survey protocol, no incentives or other response enhancement techniques, including additional requests to complete the survey, were permitted.

2.4. Data analysis

We tabulated responses and performed analysis, using Stata for Mac, Version 13.1 (StataCorp, College Station, TX). Descriptive statistics were generated, and an independent *t*-test for proportions was used compare responses for questions about COME vs. RAOM. Logistic regression was performed to determine the influence of respondent characteristics on the odds of audiogram obtainment. The study was approved the Massachusetts Eye and Ear Infirmary institutional review board.

3. Results

3.1. Participant characteristics

Of the 471 pediatric otolaryngologists who were surveyed, 127 returned the survey, yielding a response rate of 27%. 73% (91/127) of respondents were male, 68% had been in practice over ten years, and 76% reported placing over ten sets of tympanostomy tubes monthly. When asked about postoperative sensorineural hearing loss (SNHL) following tubes that was not present preoperatively, over half of the respondents reported that they had none of these cases in the past two years, while ~20% had seen over two cases (Table 1).

3.2. Clinical scenario management and audiogram obtainment

When presented with clinical scenarios, 80% would proceed with tube placement for COME, while 24.4% would do so for RAOM ($p < 0.0001$) (Table 2). Among the 10.2% and 22% who cited a need for further information for COME and RAOM, respectively, the most common factors were severity of hearing loss for COME, and parental preference, time of year, antibiotic tolerance, and severity of infections for RAOM.

Nearly three-fourths of respondents reported routinely getting a *preoperative* audiogram for COME, and 56.7% did so for RAOM ($p < 0.0001$). Evaluation for conductive hearing loss (CHL) and/or for sensorineural hearing loss (SNHL) were cited most frequently, followed by “To comply with guidelines”. Among those who rarely or never obtained pre-operative audiograms for COME, 54% cited cost, and 54% claimed that the test would not affect surgical decision-making; for RAOM, about 40% cited cost, and nearly 80% reported that the results would not alter surgical decision-making (Table 2). About 85% of respondents reported routinely obtaining a *postoperative* audiogram for COME, and ~71% did so for RAOM ($p < 0.0001$). For RAOM, 42.5% reported obtaining both a preoperative and postoperative audiogram for tube placement routinely while this increased to 65.4% for COME (Results not shown in table).