Objective Evaluation of Otoscopy Skills Among Family and Community Medicine, Pediatric, and Otolaryngology Residents

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INTRODUCTION: The objective of this study is to evaluate and compare the perceived need for otolaryngology training and otoscopy diagnostic skills in primary care (Family and Community Medicine, Pediatric Medicine), and Otolaryngology Head and Neck Surgery (OTO-HNS) postgraduate trainees. Participant otoscopy skills were evaluated using the OtoSim simulator.

METHODS: Family and Community Medicine, Pediatric, and OTO-HNS residents were recruited. Each resident participated in 3 separate otoscopy training and assessment sessions. The ability to correctly identify middle ear pathology was objectively evaluated using OtoSim[TM]. Pretest, posttest, and 3-month retention test results were compared among residents in a paired comparison paradigm. Survey data assessing exposure to OTO-HNS during undergraduate and postgraduate training were also collected.

RESULTS: A total of 57 residents participated in the study. All residents reported limited exposure to OTO-HNS during undergraduate medical training. Primary care trainees performed poorly on pretest assessments (30% ± 7.8%; 95% CI). Significant improvement in diagnostic accuracy was demonstrated following a single 1-hour teaching session (30%-62%; p < 0.001). Primary care residents demonstrated a significant decrease in diagnostic accuracy at a 3-month follow-up assessment (62%-52%, p < 0.001).

Self-perceived comfort with otology was poorly correlated to pretest performance among primary care trainees ($r = 0.26$) and showed a stronger positive correlation among OTO-HNS trainees ($r = 0.56$).

CONCLUSIONS: A single teaching session with an otoscopy simulator significantly improved diagnostic accuracy in primary care and OTO-HNS trainees. Improved performance is susceptible to deterioration at 3 months if acquired skills are not frequently used. Self-perceived comfort with otology may not be an accurate predictor of otoscopic diagnostic skill. (J Surg Ed 73:129-135. © 2015 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: otoscopy, ear pathology, otolaryngology, family medicine, Family and Community Medicine, pediatrics, primary care, OtoSim, acute otitis media, otitis externa

COMPETENCIES: Practice-Based Learning and Improvement, Medical Knowledge, Patient Care

INTRODUCTION

Otologic complaints are among the most common causes of medical consultation worldwide, especially in children.[1] The accurate diagnosis and appropriate treatment of outer and middle ear pathologies, specifically acute otitis media and otitis media with effusion, have been brought to the forefront of educational needs by the American Academy of Family Physicians, the American Academy of Pediatrics, and the

American Academy of Otolaryngology-Head and Neck Surgery (OTO-HNS).[1] In addition, otoscopy is a learned clinical skill that requires a willing patient, no visual obstruction (i.e., cerumen), and a reference bank of "normal" otologic variations. Not surprisingly, medical students, primary care trainees and practitioners, and frontline consultants have difficulty in correctly recognizing otologic pathology.[2,3] This difficulty is further compounded by variable exposure to clinical and didactic teaching in OTO-HNS during medical school and residency.[4,5] Finally, evaluation of otoscopy accuracy in both undergraduate and postgraduate medical training is lacking, and thus, an important clinical skill that directly affects patient care may not be objectively evaluated.

The objective of this study is to evaluate and compare the perceived need for otolaryngology training and otoscopy diagnostic skills in primary care and other consultant frontline physician groups such as pediatrics and OTO-HNS in postgraduate trainees. Additionally, this study sought to determine if a hands-on training session with an otoscopy simulator results in improved diagnostic performance.

METHODS

The Hospital for Sick Children Research Ethics Board's approval was obtained before commencing this study. Inclusion criteria required participating study subjects to be residents from the Departments of OTO-HNS, Pediatric Medicine, and Family and Community Medicine. Pediatric Medicine residents were based out of The Hospital for Sick Children. Family and Community Medicine residents were based out of Toronto East General Hospital, Women's College Hospital, and Trillium Health Partners. Exclusion criteria included residents who were not in the residency programs mentioned earlier at the University of Toronto, residents who were unable to commit to 3 study sessions, or residents who failed to complete all 3 study sessions. An e-mail recruitment letter was sent to residents within the Departments of OTO-HNS, Pediatric Medicine, and Family and Community Medicine. A total of 40 Pediatric Medicine residents, 45 Family and Community Medicine residents, and 25 OTO-HNS were sent the recruitment letters through the administrative assistant for each department. All residents who were able to voluntarily attend all 3 sessions were included in the study. Study participation was completely voluntary and did not have any effect on resident academic scores. Each resident participated in 3 separate otoscopy sessions: (1) preintervention assessment, (2) immediate postintervention assessment, and (3) a 3-month intervention follow-up assessment.

Preintervention Assessment

The preintervention assessment involved completion of a 3-page OTO-HNS needs assessment questionnaire (Supplementary Fig. S1) and otoscopy skill assessment. The needs assessment questionnaire was graded using a 5-point Likert scale. Study participants' assessment of OTO-HNS exposure was based on their subjective experiences during medical school and residency training. Before completing the needs assessment questionnaire, study participants were informed of the current OTO-HNS exposure provided to medical students at the University of Toronto[6] and were asked to use these standards as a reference point when assessing their own OTO-HNS exposure during medical school. To date, a study on OTO-HNS exposure during Canadian residency programs has never been performed. Comfort levels were based on participant's personal experience and not on feedback that they may have received in the past.

Otoscopy skills were assessed using 25 otologic images, where participants were asked to identify common otologic/ear (external and middle) pathologies using the ear simulation teaching tool, OtoSim. It is an education otoscopy simulation tool that allows practice of otoscopy on a realistic model ear with exposure to more than 200 high-fidelity images of varying ear anatomy and pathologies. Previous studies have validated OtoSim's[TM] ability to significantly increase the diagnostic accuracy of medical students in small-group settings.[7,8] A total of 25 otologic images were selected at random. This number of images allowed for appropriate representation of common ear pathologies (i.e., acute otitis media) and less common ear pathologies (i.e., congenital cholesteatoma).

Intervention and Immediate Postintervention Assessment

For the immediate postintervention assessment, each participant underwent an intervention of a 1-hour otoscopic skills training seminar including didactic teaching and hands-on simulator (OtoSim[TM]) training. This was followed by another examination with 25 otologic images using OtoSim[TM] to identify common otologic pathologies —these images were unique with no repeat images from the previous assessment.

Three-Month Postintervention Assessment

The 3-month follow-up assessment was a retention assessment. The 3-month follow-up period was chosen to (1) ensure that participants remained at their hospital site, allowing for better follow-up, and (2) to provide adequate time between sessions to assess retention. Participants' otoscopy skills were reassessed with an additional examination with 25 otologic images at the aforementioned 3 months following their postintervention assessment. Again, these images were unique from the 2 previous sessions with no repeat image presentations. Objective assessment of OTO-HNS exposure between study sessions was not performed.