Acute Mastoiditis in the Pneumococcal Conjugate Vaccines Era

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Objectives: (1) Describe the changing trends in mastoiditis incidence and bacteriology in the pneumococcal conjugate vaccine (PCV) era.

Methods: PCV-7 and PCV-13 have been gradually implemented in the Israeli national immunization program in 2009 and 2010, respectively. We retrospectively identified children aged 0-6 years who had middle ear cultures obtained from “severe” acute otitis media (AOM) episodes, defined as AOM requiring tympanocentesis or presenting with spontaneous otorrhea, during the years 2008-2013. Of those, we identified children with acute mastoiditis. Data were extracted for demographic, clinical and microbial information.

Results: Data from 295 eligible AOM episodes reported in 279 children were collected. Of those, 56 children with 57 episodes of acute mastoiditis were identified. Of these 36 were boys (64%) and 37 (66%) were <2 years old. During the pre-PCV and the PCV introduction period (January 2008-November 2010), mastoiditis incidence rate was significantly higher than the post-PCV introduction era (December 2010-December 2013) incidence, 0.23 versus 0.16/”severe” AOM episode, respectively (P = .04). Mastoiditis developed despite adequate systemic antibiotic therapy for AOM in 28 (49%) patients. Of the 21 (37%) positive cultures, Streptococcus pneumoniae was the most common bacteria, which was solely isolated in 17 (81%) episodes and in combination of Haemophilus influenzae in 1 (5%) episode. Notably, there were no isolates of S pneumoniae from mastoiditis patients following the first year after PCV-13 introduction.

Conclusions: Mastoiditis incidence complicating “severe” AOM decreased after the introduction of PCVs, which can be directly attributed to their effectiveness in reducing pneumococcal-related AOM burden and complications.

Characteristics of Supraglottitis in Adults

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Objectives: Describe the demographics, clinical presentation, interventions, and outcomes of adult patients diagnosed with acute supraglottitis.

Methods: We retrospectively identified adult patients with acute supraglottitis during the years 1990 through 2013 by using relevant International Classification of Disease codes. Data were extracted for demographic and clinical information.

Results: A total of 288 eligible patients were enrolled. Diagnosis was made by either indirect or fiber-optic laryngoscopy (or both modalities). The incidence rate of acute supraglottis was 4.3 out of 100,000 patients/year, with a steep rise during the years 1999 through 2013. A slight male predominance was observed (n = 160, 56%). The mean age was 50 ± 16 years, and 77% were 30 to 70 years old. Sore throat (94%) and dysphagia (88%) were the most common presenting symptoms, which had begun 2 days prior to hospitalization. Comorbidities were reported in 62% of the patients. Swabs were obtained in 17% of patients, of those 23% were positive. Patients were hospitalized either in the otolaryngology department (n = 255, 89%) or in the intensive care unit (ICU) (n = 33, 11%). Of the ICU patients, 19 (58%) had an airway securing intervention procedure (84% upon admission, 16% during initial 24 hours surveillance). Amoxicillin-clavulanate was administered in 61% of patients. Intravenous and inhalational corticosteroids were administered in 190 (66%) patients. The mortality rate was 0.003%.

Conclusions: The signs and symptoms of supraglottitis in adults are different from those in the pediatric population. Patients presenting with sore throat, dysphagia, or odynophagia should be cautiously suspected for supraglottitis until proven otherwise. Treatment includes intravenous antibiotics and steroids and outcomes are excellent.
New Algorithm for Supraglottitis
Staging in Adults
Tal Marom, MD (presenter); Irina Barbalt, MD; Stanislav Spevak, MD; Yehudah Roth, MD; Sharon Ovnat Tamir, MD

Objectives: (1) Critically review the current staging systems of supraglottitis in adults. (2) Suggest a new algorithm for infections involving the supraglottis based on clinical staging considering anatomical subsites and outcome correlation.

Methods: We retrospectively identified adult patients with acute supraglottitis during the years of 1990 through 2013 by using International Classification of Disease codes. Patients were graded by using 2 systems: the Scope grading system for epiglottitis, and our new suggested grading system, which relies on the edema in 3 subsites: the epiglottis, the aryepiglottic folds and arytenoids, and the larynx. Those subsites were given the following grades: 0 = no edema, 1 = mild edema, 2 = moderate edema, and 3 = severe edema. Summation of the 3 subsites scores was performed in order to assess the need for airway intervention.

Results: A total of 288 eligible patients were enrolled. Diagnosis was made by either indirect or fiberoptic laryngoscopy (or by both modalities). One hundred seventy-eight patients (62%) had Scope grades of 0 or 1, and 110 patients (38%) had Scope grades of 2 or 3. Of these, 24% required an airway intervention. According to our classification, 236 patients (82%) who had a score of ≥4 were less likely to undergo a securing airway intervention, when compared with the 52 patients (18%) who had a score of ≥5, 4% vs 33%, respectively (P = .03). All patients graded with ≥8 score required airway intervention.

Conclusions: Our new suggested flow chart of decisions is based on an easy grading system, which allows dynamic description of patient progression during sequential examinations, easy information transmission, and decision making.

Prevalence and Risk Factors of Otitis Media with Effusion Among School Children in Saudi Arabia
Humaid I. Alhumaid, MD (presenter); Ashraf S. Abou-Halawa, DO

Objectives: Determine prevalence of otitis media with effusion (OME) in school children and analyze relevant risk factors.

Methods: Through a cross-sectional study, 1488 children in the age range, 6 to 12 years were randomly selected from 25 primary schools. A questionnaire was used to determine risk factors for OME. Otoscopy and tympanometry were used to diagnose and confirm OME. Pure tone average for children with confirmed OME was measured. Teachers of the children were asked to complete a questionnaire evaluating child’s level of school performance. Those with or without OME were compared.

Results: Prevalence of OME was 7.5% (112/1488). In univariate analysis, it was strongly associated with recurrent acute otitis media (AOM; P < .0001) a large family size (P < .0001), young age (P < .0001), low maternal education (P < .0001), and hearing loss symptom (P < .0001). OME was significantly higher in schools located in rural districts (P < .001). It is less strongly associated with history of preschool acute otitis media (P = .002), nasal discharge (P = .003), and snoring (P = .03). Of these factors, 5 were found to be significant in the multivariate logistic regression model: age (odds ratio [OR] = 0.191, 95% confidence interval [CI]: 0.124-0.295), family size (OR = 4.192, 95% CI: 2.033-8.643), school district (OR = 3.037, 95% CI: 1.933-4.772), maternal education (OR = 0.399, 95% CI: 0.256-0.621), and recurrent AOM (OR = 4.914, 95% CI: 2.677-9.02).

Conclusions: Prevalence of OME in Qassim region reaches 7.5% in school children. Young age, large family size, low maternal education, preschool AOM, hearing loss symptom, recurrent AOM, nasal discharge, and snoring are significant factors associated with the disease.

Role of Vastus Lateralis Myofascial Free Flap in Reconstruction of Head and Neck Defects
Philip Robb Jr, MD (presenter); Jennings R. Boyette, MD; Mauricio A. Moreno, MD

Objectives: There is a paucity of data regarding the role of the vastus lateralis free flap (VLFF) in head and neck reconstruction. Our objectives were to (1) describe the flap outcomes in this setting and (2) identify ideal clinical scenarios for its use.

Methods: Retrospective review of 7 patients undergoing reconstruction with a VLFF at an academic tertiary institution between 2009 and 2013. Demographics, indications, complications, and outcomes were retrieved.

Results: There were 4 males and 3 females with a mean age of 54.7 years. Indications included skull base reconstruction (n = 3/43%), scalp/calvarial defect (n = 2/28%), maxillary (n = 1), and exposed pharyngeal cervical spine hardware (n = 1). The myofascial component length ranged from 7 to 20 cm, and width ranged from 6 to 11 cm, with a mean area of 102 cm² (range, 35-240). The mean pedicle length was 11.3 cm. Handheld (n = 3) or implantable (n = 4) Doppler was used for monitoring, and there were no flap losses. The flap was skin grafted in 3 cases with no reported graft loss. The mean intensive care unit stay was 1.1 days (0-3) and length of stay was 7.8 days (5-13). Complications included wound infection (n = 1) and myocardial infarction (n = 1) in a patient with significant comorbidities. The donor site was closed primarily in all cases, with no significant donor site morbidity reported.

Conclusions: The VLFF is an underutilized option in head and neck reconstruction. This flap provides a large amount of soft tissue that can be harvested in supine position and with minimal donor site morbidity. Given its long pedicle and variable myofascial component that can be tailored to a wide range of defects, the VLFF appears ideal for skull base reconstruction.
Sinus Disease following Total Laryngectomy: A Radiographic Review

Arjun K. Parasher, MD (presenter); Sarah M. Kidwai; Abib A. Agbetoba, MD; Alfred M. Illoreta, MD; Satish Govindaraj, MD; Brett A. Miles, MD

Objectives: (1) Compare the incidence of radiographic sinus disease before and after laryngectomy by retrospective analysis of preoperative and postoperative computed tomography (CT) scans. (2) Analyze the change in pre-existing radiographic sinus disease via a subset analysis.

Methods: A single-institution retrospective chart review was conducted. Patients who received a total laryngectomy or total laryngopharyngectomy between 2002 and 2012 with preoperative and postoperative CT scans were included. The Lund-Mackay (LM) Scores for each sinus as well as the total LM score were recorded for both scans. The assessment of differences in these scores is based on McNemar’s statistic for each sinus and on a paired t-test for the total LM score.

Results: Surgical removal of the larynx creates an anatomical disconnect between the sinonasal cavity and distal respiratory tract. Normal nasal airflow is disrupted, resulting in alterations to the nasal mucosa, mucociliary clearance, and nasal flora. While the incidence of sinonasal disease in patients undergoing total laryngectomy has been studied via subjective scoring methods, this study is the first to evaluate radiographic sinusitis via an objective measure by comparing Lund-Mackay scores before and after total laryngectomy. There were no significant differences in the LM scores between preoperative and postoperative scans within each sinus (P value >.05) or in the total LM score (t statistic >0.56).

Conclusions: In patients undergoing total laryngectomy, disruption in nasal airflow has been correlated with altered sinonasal physiology and decreased subjective symptoms. However, our study shows no significant change in radiographic evidence of sinonasal disease after laryngectomy.

Subjective Assessment of Voice, Nasality, and Swallowing Changes in Patients with OSAS after Anterior Uvuloplasty

Nora Siupsinskiene MD, PhD (presenter); Laura Lisauskaite, MD

Objectives: None provided.

Methods: In this prospective clinical study, 41 adult patients (32 males, 9 females) diagnosed for obstructive sleep apnea syndrome (OSAS) and operated at university hospital by anterior uvulopalatoplasty between December 2008 and December 2010 at least 6 months (median 10.0 months) before investigation, formed the study group. A total of 17 nonoperated OSAS patients matched by age, sex, smoking rate, and OSAS severity served as controls. Post service with questionnaires and telephone conversation was accomplished. Patient and control symptoms (hoarseness, nasality of voice, and dysphagia) were assessed using 10-point Likert scale (1-normal). Voice quality was assessed by voice handicap index (VHI), and hypernasality by auditory perceptual Gutzmann hypernasality test.

Results: Hoarseness ratings for OSAS patients were similar before and after the surgery, with no significant impact on voice handicap. Moreover, total VHI score significantly dropped after the surgery from 9.2 points to 5.4 points out of maximum 120 ($P < .05$). Mild nasality of voice with mean intensity score of $1.4 \pm 1.0$ points was self-rated by 17.1% of patients, but postoperative rating was significantly lower than that before surgery ($2.0 \pm 1.9$; $P < .05$). No significant differences were found in dysphagia scores and Gutzmann test before and after the palatal surgery and between treated by surgery and control groups.

Conclusions: Anterior uvulopalatoplasty does not result in significant changes in voice, nasality and swallowing when rated by OSAS patients and by clinical assessment.

Vestibulo-ocular Reflex (VOR) Impact on USAF Undergraduate Pilot Training Proficiency

Jeffrey A. Sorensen, MD (presenter); Paul C. Johnson IV, MD; David G. Schall, MD; Kenneth W. Stephens

Objectives: The US Air Force (USAF) enrolls 1400 Specialized Undergraduate Pilot Trainees (SUPT) at 3 locations within the United States each year. SUPT training has an estimated accumulated cost of $1M to $1.5M per trainee. Attrition rates from training have ranged from 7.8% to 36.9%. The cost associated with trainee disqualification is estimated at $1M per percentage point of annual attrition. One percent of UPT disqualifications are due to medical factors and another 1.5% are due to failure to adapt to flying.

Methods: In 1994 the USAF conducted rotary chair vestibulo-ocular (VOR) test on 150 SUPT candidates at the USAF Research Laboratory, Brooks Air Force Base as part of the second phase of the Enhanced Flight Screening Medical Study (EFS-M). Retrospective review of SUPT scores was correlated with pretraining VOR test results of the original 150 pilots who participated in the EFS-M VOR data collection. Twenty-year prospective survey data collected from EFS-M study pilots was correlated to initial EFS-M VOR test results to identify trends in their subsequent pilot career progression and incidence of in-flight physiologic events deemed linked to vestibular illusions.

Results: VOR performance trends exist between USAF pilot trainee cohorts. VOR performance can predict initial flight training proficiency in SUPT candidates. Long term follow-up survey responses indicate that VOR performance can predict flight career proficiency in SUPT training candidates.

Conclusions: A validated correlation between VOR results and flight performance can help establish VOR test parameters associated with successful flight training ability.