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Pneumatic Otoscopy and Tympanometry - A Prerequisite for Adenoidectomy/ Adenotonsillectomy-Our Protocol

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Short Communication

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Short Communication

Otitis Media with Effusion (OME) associated with risk factors like recurrent upper respiratory tract infections is considered as the most common cause of silent hearing impairment among children.OME is defined as the presence of fluid in the middle ear without signs and symptoms of acute ear infection. Synonyms of OME include Ear fluid (Glue Ear) and serous, secretory or non-suppurative otitis media. Approximately 80% of children aged 2-4 year have hearing loss due to middle ear effusion that lasts 3 months or longer. The prevalence of otitis media with effusion in children is bimodal. The first peak is in those aged 2 years or younger and second peak is at 5-6 years. Thereafter it sharply declines in children older than 6 years [1]. Besides this, OME plays a significant role in delayed language development, social developmental backwardness and also affects educational skills [2]. Even World Health Report describes hearing loss due to OME as a serious problem due to its influence on the language development as well as its impact on school life.

Thus OME needs monitoring over time to identify the persistence of disease and to assess their hearing thresholds as a surrogate of auditory disability. It will be useful if tympanometry can be used to predict those having hearing impairment. Studies have shown that limiting audiometry to those with Type B and Type C tympanogram reduces the workload to 69% of the sample and 95% of children will be identified. With such data decisions as to how to allocate audiometric resources for monitoring children, tympanometry should be really recommended [3,4]. Under Preventive Audiology, we have made continuous efforts and have done various studies. Assessment of hearing impairment was done in nursery and primary school children both in Urban and Rural areas to assess the volume, type and causes of hearing impairment in young children.Keeping in view large number of young children having recurrent upper respiratory tract infection, tonsillitis, adenoiditis and chronic adenoidal hypertrophy, another study in 1000 young children presenting to Department of ENT and Paediatrics in a tertiary health care centre was done where all these children were evaluated by taking proper history, general physical and complete ENT examination, followed by Pneumatic Otoscopy and tympanometry. Whenever there was subjective/objective hearing impairment or tympanometry showed B or C type, the hearing evaluation was done by Pure Tone Audiometry/ Free Field Audiometry/ Brainstem Evoked Response Audiometry depending upon mental age of the child. In our studyin 2000 ears, 665(33.4%) were having B type tympanogram (indicating fluid behind the tympanic membrane) and 197(9.85%) were having C type (indicating retracted tympanic membrane). So as per the parameters for diagnosis of OME, the incidence came out to be 33.4%. It was seen to be 33% in a study by Sinha, et al. [5] and 20.75% in another study done by Yadav [6].

Another study, Clinico-Audio-Radiological and Operative Evaluation of 300 diagnosed cases of Otitis Media with effusion was undertaken by us. All these children underwent pneumatic otoscopy, tympanometry, PTA/ABR and X-Ray soft tissue nasopharynx lateral view for adenoids. All patients were given adequate medical treatment and were followed up for 3-6 months. Patients who did not respond to the treatment were subjected to Adenoidectomy along with ear examination under magnification (EUM) and Myringotomy with or without grommet insertion. Adenoidectomy was done in all these patients with Myringotomy in 472 ears and Grommets were inserted in 365 ears. Otoscopy examination showed

amber or blue discoloration with thickening and loss of landmarks. Bubbles or fluid level was seen in very few (2%). Demonstration of impaired drum mobility by pneumatic otoscopy was much more reliable than simple inspection. Tympanometry revealed B typein 50.17%, C type in 15.33% and in rest 34.5% it was Type A. Adenoid hypertrophy was Grade II, III and IV in 22%, 54.6% and 23.33% respectively. Myringotomy was done in 78.6% and in them, 22.67% had dry tap, 28.81% had serous whereas 48.52% had mucoid type. The sensitivity, specificity, positive and negative predictive values and accuracy of various diagnostic parameters used in the study were calculated taking Myringotomy as the Gold Standard. Type B tympanogram had the best balance of sensitivity and specificity of 85.07% and 93.94% respectively. Average improvement in air conduction threshold was observed to be 8 dB and 7.5 dB in right and left ears respectively at 2 months followup, however it dropped to 6 dB and 5.5 dB at 6 months follow up. The correlation of clinico-audio-radiological and operative evaluation with each other asserted that OME with adenoid hypertrophy should be managed aggressively (Adenoidectomy with Myringotomy in a single sitting) and it can help in avoiding hearing impairment and developmental delay.

After these studies and our experience, we have adopted a Protocol that all children going to be operated upon for Adenoidectomy or Adenotonsillectomy must undergo Pneumatic Otoscopy before surgery. Ears with B and C type tympanograms are being subjected to Myringotomy and Grommet insertion (if indicated) along with the required Adenoidectomy or Adenotonsillectomy. It not only helps in restoring hearing impairment being caused by OME but will also prevent its more serious sequelae such as Tympanosclerosis, Chronic adhesive otitis media and even chronic otitis media. Tympanometry is a simple, quick, non-invasive and objective test making it the Ideal Diagnostic tool for Otitis media with effusion. The American Academy of Otolaryngology – Head and Neck Surgery Foundation in their "Clinical Practice Guidelines: Otitis Media with Effusion" has also emphasized the Role of Pneumatic Otoscopy and Tympanometry to improve the diagnostic certainty for Otitis media with effusion [7].

Under Preventive Audiology with our experience we recommend that for prevention of this silent hearing impairment, "Peep into the ears of the child at the earliest opportunity and proceed accordingly if one suspects OME." Pneumatic otoscopy and Tympanometry is a Gold Standard examination and investigation that needs to be done in young children for preventing and managing OME, the commonest cause of silent hearing impairment. The protocol "Pneumatic Otoscopy and Tympanometry – A prerequisite for Adenoidectomy/ Adenotonsillectomy", if followed, will definitely contribute towards Global and National Programmes on Prevention of Hearing Impairment especially in young children.

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