Viral and bacterial causese of otitis media

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Acute otitis media (AOM) is a common clinical problem facing all providers who care for children. Before the age of 2 years, 94% of children will have had at least one episode of otitis media (OM). The peak age for OM is between 6 and 13 months. The occurrence of AOM decreases, however with age, and by 6 years of age, AOM is relatively uncommon in healthy children.Otitis media is defined as an inflammatory reaction of the lining mucous membrane of the middle ear cleft. There are many forms of OM concerning the etiology, pathophysiology, clinical manifestations and duration.The epidemiological studies of OM in children are difficult to be performed and interpreted, due to difficulty in collecting adequate and representative materials and due to the lack of sensitive and reliable diagnostic methods. Nevertheless, several prospective studies have recently investigated the role of viruses, bacteria, and other agents in the etiology of OM, using cultures, immunological methods, PCR, or combinations of these methods.The predisposing factors for the occurrence of OM are low birth weight, malnutrition, passive smoking, poor socioeconomic status, large family size anatomical craniofacial abnormalities, family history of asthma, and air pollution. Presence of a respiratory tract infection or conjunctivitis increases the risk of development of AOM.Studies have documented the close association between OM and viral upper respiratory tract infection (URI) that clinics have long suspected. Also URI has been also determined to be the most important risk factor for development of early OM in infants.Epidemiologic evidence has long suggested a close association between URI and AOM. For example, AOM generally occurs concurrently or just after viral URI, the age of peak incidence of AOM (6 to 24 months) coincides with ages when viral URIs are prevalent, and the highest incidence of AOM occurs during the winter respiratory seasonAOM is typically caused by 1 of 3 pathogens, S. pneumoniae, nontypeable H. influenzae (NTHi) or M. catarrhalis. Although these 3 pathogens are responsible for most cases of AOM, their individual incidence varies by the type of AOM infection.AOM is generally considered a bacterial infection that is treated with antibiotics. However, bacterial pathogens cannot be isolated from the MEF in approximately 30% of AOM cases. Although the causes of such sterile cultures might include technical inadequacies resulting in loss of bacterial growth or the presence of fastidious bacterial organisms, the substantial proportion of AOM cases without a proven bacterial etiology has initiated an intensive search for the role of viruses in the etiopathogenesis of this condition. During the past 2 decades, research in this area has produced strong evidence for the crucial role of viruses in the development of AOM.The most common viruses detected in the middle ear fluid

(MEF) are respiratory syncytial virus (RSV), influenza viruses, adenovirus, and parainfluenza (PIV) viruses, however, several other viruses, such as cytomegalovirus and herpes simplex virus, have also been isolated in the MEF specimens from children with AOM.The development of the PCR technique has substantially increased the rates of viral detection in middle ear effusion (MEE). In recent PCR-based studies, viral materials have been detected in up to 70% of MEEs from children with AOM.The aim of the work is identification of the etiological viral and bacterial causes of OM in children.This work was carried out in Microbiology and Immunology Department of Benha Faculty of Medicine from October 2005 to June 2007 and included 40 pediatric patients of OM selected from ENT Outpatient Clinic of Benha University Hospital.Two samples were taken from each patient, ear discharge was taken and used for viral and bacterial isolation and a serum sample, collected to be used for detection of IgM by indirect IF assay. Patient sera were tested for IgM antibodies against RSV, PIVs, influenza A and B viruses and adenovirus by indirect IF using the pneumoslide M.As regard to the comparison between indirect IF using pneumoslide M and cell culture for detection of respiratory virus infection, the sensitivity of the test was 95 %, the specificity was 100%, the positive predictive value was 100%, the negative predictive value was 95.2% and the accuracy was 97.5%.As regard to bacterial isolation from ear discharge, virus isolation from ear discharge and IgM detection by indirect immunofluorescence using Pneumolside M test, bacterial causes were identified in 16 cases (40%), viral causes were identified in 14 cases (35%), mixed viral and bacterial agents were identified in 7 cases (17.5%), in addition to 3 of undiagnosed cases (7.5%).As regard to viral isolation from ear discharge, viral causes of OM were identified in 14 cases. Out of these positive cases, 9 cases were caused by RSV infection (22.5%), 3 cases of PIV (7.5%), one case of adenovirus (2.5%), and one case of influenza A virus infections (2.5%).As regard to the bacteriological examination of ear discharge, bacterial causes of OM were identified in 16 cases (40%). Out of these 16 positive cases, 4 cases of pneumococcal infection (10%), 4 cases of H.influenza infection (10%), 2 cases of Moraxella catarrhalis infection (5%) 2 cases of Staph. aureus infection (5%), one case of Pseudomonas, infection (2.5%), in addition to combined infection with Strept. pneumoniae, H.influenza and Moraxella catarrhalis (5%) and combined infection with Strept. pneumoniae, H.influenza (2.5%).from this study we conclude that etiological diagnosis of OM is very essential for proper management as 35% of OM were caused exclusively by viruses which will not need empirical antibiotic treatment and need only supportive care. This will improve the economic impact of antibiotic therapy and will decrease the potential development of antibiotic resistant bacteria.RSV is the most frequently isolated virus in this study as it was identified to cause 22.5% of the studied cases followed by PIVs, adenovirus and influenza A virus.Strept.pneumoniae is the commonest identified bacteria to cause OM in children, followed by H.influenza, Moraxella catarrhalis and Staph. aureus.IgM detection by indirect IF using pneumoslide-M test is a useful method of diagnosis. It is an economic easy technique as it dose not require well equipped laboratories, but it needs a fluorescent microscope, high quality reagents to perform and read it reliably.It has a high sensitivity and specificity in diagnosis of respiratory virus infection. It is better than cell culture because no heavy equipment and little

experience are needed.