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Role of parainfluenza virus types in otitis media in Babylon – Iraq

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ABSTRACT

Acute otitis media (AOM) happens as a developed of viral upper respiratory tract infections in young children. Respiratory viruses and AOM both exhibited seasonal discrepancy. Respiratory paramyxoviruses, consist of human parainfluenza viruses are highly predominant, cause the common of childhood croup, bronchiolitis, and pneumonia. The study was conducted from 5 February 2016 to 2 April 201650 cases of otitis media infection were identified in patients admission to AL-Hilla teaching hospital in Babylon, Iraq. Patients with chronic health problems or anatomic or physiologic deficiencies of the ear or nasopharynx were excluded Ear swabs and nasopharynx secretion specimens were collected for studies the viral infection. specimen was smeared on microscope slides and prepare to direct immunofluorescence for parainfluenza virus one, two and three types antigen detection.The results display the percentage of parainfluenza virus in AMO 46% , 23 were positive from 50 cases . The results also show percentage of parainfluenza virus one, two and three types were 34.7, 13.0 and 52.17 respectively .thestudy aim to show the correlation between the types of Parainfluenza viruses and ability to cause AMO in Babylon city.

KEY WORDS: Otitis media, Ear swabs, nasopharyngeal secretion, Parainfluenza virus

1. INTRODUCTION

(AOM) is the important cause of bacterial pediatric infections correlation with viral upper respiratory infections (Verhoeven, 2014). Bacterial cause AOM by Viral URI that stimulating the increased of bacteria and speed inflammation in the nasopharynx and Eustachian tube, that consequently allow bacterial pass into the middle ear space (Ruohola, 2013). Themain risk factor for AOM is a Viral URI however, the tendency to cause disease differ depend on the specific viruses (Pettigrew, 2011).More than 60% of upper respiratory tract infection series are developed by acute otitis media (AOM); a common reason for outpatient hospital admission and antibiotic use in children (Stockmann, 2014).Four distinct serotypes of Human parainfluenza viruses have envelop and single-stranded RNA belonging to the paramyxo virus family, They are about 150–250 nm in size and include of negative sense RNA with a genome compose ~15,000 nucleotides (Palermo, 2016).

2. MATERIALS AND METHODS

From 5 February 2016 to2 May 2016 50 cases of otitis media infection were identified in patient's admission to AL-Hilla teaching hospital in Babylon – Iraq. None of the children had received antibiotics, patients with chronic medical difficulties or anatomical or physiological deficiencies of the ear (puncture) were excluded. Measures for acute otitis media diagnosis involved the acute onset of signs (fever, irritability, or earache), signs of tympanic membrane inflammation, and the presence of fluid documented by pneumatic otoscopy and/or tympanometry. AOM series cause within a month of URI onset were considered a developed of URI. Ear swabs and secretion of nasopharynx specimens were collected for viral studies. Immediately after collection Ear swab and nasal-wash specimen add with three to five ml of phosphate buffered saline (PBS) to the specimen prior to centrifugation to reduce the viscosity and dilute the mucus. Centrifuge the mucus extractor at room temperature (15-30°C) for 10 minutes. After the remove of the supernatant re-suspend precipitate in two mL PBS and smoothly pipette the cells up and down with a wide bore pipette, or vortex gently, until the mucus is changing and cellular material is released. Specimen was smeared onto microscope slides and subjected to direct immunofluorescence for parinfluenza virus one, two and three types antigen detection was done in consistent with the manufacturer's instructions (OXOID, UK).

Statistical analysis: Data were analyzed statistically using complete randomized design (CRD), LSD and X2 test (Niazi, 2004).

3. RESULTS AND DISCUSSION

Direct immunofluorescence for parainfluenza virus 1, 2 and 3 type's antigen was positive in 23 of 50 tested cases demonstrating by using immunofluorescence microscope. Figure (1) show direct immunofluorescence examination for parainfluenza virus one, two and three types, in case from both Ear swabs and nasopharyngeal secretion

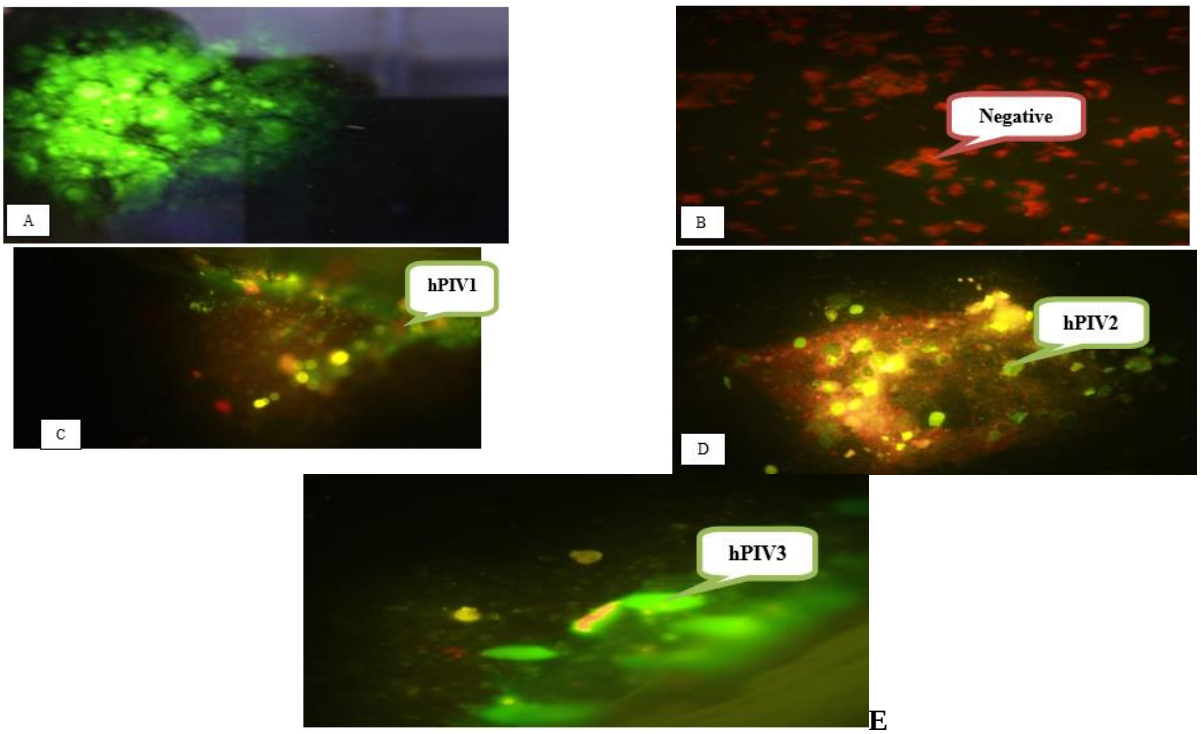

Figure.1.A positive control for parainfluenza virus by direct immunofluorescence assay, B negative specimen for parainfluenza virus by DIF assay revealed red color, C positive specimen in ear swabs for parainfluenza virus type 1 by DIF assay revealed green apple color, D positive specimen in ear swabs for parainfluenza virus type 2 by DIF assay revealed green apple color, E positive specimen in ear swabs for parainfluenza virus type 3 by DIF assay revealed green apple color

Table.1.Prevalence of parainfluenza virus in the middle Ear swabs and nasopharyngeal secretion in children with otitis media

Age of patient	No of specimens	**Positive cases for HPIV by** Direct immunofluorescence **assay**			
		Positive cases	Percentage %	Negative cases	Percentage %
New born- 7 month	19	9	39.1%	10	37.0%
1year- 4year	23	11	47.8%	12	44.4%
5year- 6year	8	3	13.0%	5	18.5
Total	50	23	46%	27	54%

Significant differences ($p<0.05$) = 0.0001

Table.2.Relation between types of parainfluenza and age of patient in ear swab and nasal swab

Age of patient	No of specimens	Positive cases of hPIV by Direct immunofluorescence assay			
		Positive cases	hPIV1	hPIV2	hPIV3
New born- 7 month	19	9	3(37.5)	1(33.3)	5(41.6)
1**year- 4year**	23	11	4(50)	2(66.6)	5(41.6)
5year- 6year	8	3	1(12.5)	0	2(16.6)
Total	50	23	8(34.7)	3(13.0)	12(52.17)

($p>0.05$) = 0.086

HPIVs known respiratory pathogens and are common causes of URTI and LRTI, Previous studies have mainly focused on HPIV-1, HPIV-2 and HPIV-3 in child infection because of high positive rate and morbidity of three types of this virus in children, therefore not as much of is known about HPIV-4 infection and parainfluenza infection in adults (Liu, 2013). The results shows significant dissimilarities ($P< 0.05$) the ratio of parainfluenza prevalence among otitis media infection were 46% (23 from 50 cases), the higher percentage occur in age group (1-4) year and (New born- 7 month), were 47.8 % and 39.1 % respectively, table (1). In 80% of children before the age of three years parainfluenza virus cause otitis media(OM) also some-times it may cause meningitis, learning difficulties and learning loss (Short, 2011).

The results also shows the percentage of parainfluenza virus type three were higher 52.17% follow parainfluenza virus type one were 34.7 % and parainfluenza virus type two were 13.0 % , no statistical significant

variances(P= 0.05) table (2). HPIV3 is widely prevalent in children at least 60% of children have been infected with HPIV3 at in age 2 years of age, with 80% infected at age of 4 years of age (Palermo, 2016 and Hsieh, 2010). This results identical with researcher Liu 2013 in his study HPIVs were identified in 178/4755 (3.7%) samples. A 99 (2.1%) smear samples were positive for type three, 58 (1.2%) for type one, 19 (0.4%) for type two.

4. CONCLUSION

The study showHPIV1 and HPV2 are widely prevalent in age group (1year-4year) while HPIV2 is widely prevalent in both age group (new born-7 month) and 1year-4year). The clinical appearance of parainfluenza viral infection may varies according to patient age.

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