



Problems of Pediatrics

# The Incidence of Exudative Otitis Media in HIV Infected Children

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## Abstract

Diseases of the ENT organs are among the commonly prevalent and dangerous pathologies of childhood, occurring as a complication of respiratory, bacterial diseases and HIV infection. One of the serious complications of HIV infection in children is the lesion of ENT organs. In HIV infected children, in addition to suppurative diseases occur middle ear diseases with nonsuppurative origin. A total of 79 HIV infected children aged 3-14 years with different pathologies of the nasal cavity, nasopharynx and paranasal sinuses were included into the current study. The control group included 20 healthy children of comparable age and sex. The survey was conducted in the ENT department of the Children's Multi-Medical Center, in Bukhara region. Children with a diagnosis of suppurative otitis media and/or history of suppurative otitis media were not included into the study. All HIV infected children, along with physical examination, were performed ENT examination, finger study, X-ray examination of the paranasal sinuses, audiological research and impedancemetry. IJBM 2012; 2(3):211-213. © 2012 International Medical Research and Development Corporation. All rights reserved.

**Key words:** *exudative otitis media, HIV, children.*

## Introduction

Diseases of the ENT organs are among the commonly prevalent and dangerous pathologies of childhood, occurring as a complication of respiratory, bacterial diseases and HIV infection. One of the serious complications of HIV infection in children is the lesion of ENT organs. In HIV infected children, in addition to suppurative diseases occur middle ear diseases with nonsuppurative origin [1, 5, 8].

In recent years, among the non-purulent middle ear pathology occur the significant increase in the frequency of exudative otitis media (EOM) [3, 6, 7]. The high frequency of disease, low efficiency of the treatment and the development of complications with the transition to the chronic forms, often leading to the development of hearing loss, dictate the need for early detection of disease, development of timely diagnosis and adequate treatment of the EOM [4-7].

There is evidence that in 90% of children under 5

years old at least once had EOM symptoms, and the peak of incidence is usually between the ages of 2 to 4 years [3, 5, 6]. The frequency of the EOM occurrence and the nature of hearing loss are correlate with the conditions of the upper respiratory tract, the diagnosis and treatment of the ENT diseases [5-7].

The purpose of this study was to determine the frequency of occurrence of the EOM in HIV infected children with pathology of the nasal cavity, nasopharynx and paranasal sinuses.

## Material and Methods

A total of 79 HIV infected children aged 3-14 years with different pathologies of the nasal cavity, nasopharynx and paranasal sinuses were included into the current study. The control group included 20 healthy children of comparable age and sex. The survey was conducted in the ENT department of the Children's Multi-Medical Center, in Bukhara region. Most patients (68.3%) were aged 3-7 years. The number of boys was greater (77.8%) than girls (22.2%). Children with a diagnosis of suppurative otitis media and/or history of suppurative otitis media were not included into

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the study.

All HIV infected children, along with physical examination, were performed ENT examination, finger study, X-ray examination of the paranasal sinuses, audiological research and impedancemetry.

Tone and threshold audiometry in children older than 4 years was performed using clinical audiometers Pracitronic MA-31 and Donac-22 (Germany) with a frequency range from 125 to 8000 Hz. Impedancemetry was performed on Welch Allyn Vision-4 and Zodiac-901 (Germany) devices, with ipsilateral stimulation with a probe tone frequency of 500 to 4000 Hz with pressurized air from +200 to -400 mm H<sub>2</sub>O. Obtained data was processed using the standard methods of medical statistics.

## Results and discussion

There were four main nosological forms of ENT diseases observed: in 55 children diagnosed adenoid vegetations, in 19 - curvature of the nasal septum, in 6 - vasomotor rhinitis, 4 of them - have had an allergic form, 2 - neurovegetative, and in 38 - inflammation of the paranasal sinuses.

In 36 children a combination of 2 or more diseases occurred. The most frequently observed combination of adenoid vegetation and purulent sinusitis - in 19 patients. The simultaneous presence of adenoid vegetation and the curvature of the nasal septum was detected in 7 children. Mixed-disease in the form of the curvature of the nasal septum and purulent sinusitis was diagnosed in 7 patients.

In 3 children revealed the simultaneous presence of three abnormalities: disease of the nasal cavity, paranasal sinuses, and throat - adenoid vegetation, purulent sinusitis, and the curvature of the nasal septum.

All the surveyed children with disorders of the nose and paranasal sinuses were divided into 2 - groups:

1. 43 patients with only one form of ENT pathology (pathology only the nasal cavity, paranasal sinuses or nasopharynx),
2. 36 patients with a combination of 2 or more diseases.

Audiological study allowed an accurate diagnosis of EOM in 58 HIV-infected patients. The nature of tympanogram and results of otoscopic examination allowed us to identify four stages in the course of the EOM according to the N. S. Dmitrieva's classification: catarrhal, serous, mucosal and fibrinous [3].

At otoscopy and audiological study signs of EOM detected in 15 (34.9%) children in Group 1.

EOM detected in 8 out of 20 children with adenoids, which is 40% in relative terms. In addition, the EOM was diagnosed in 5 (38.5%) HIV infected patients from a total of 13 patients with purulent sinusitis, and 1 patient (20%) of 5 with the curvature of the nasal septum.

A similar pattern was observed in children with vasomotor rhinitis: ESP was diagnosed in 1 (20%) of 5 patients.

In Group 2, the symptoms of the EOM observed in 34 (94.4%) HIV-infected children.

Among the patients in Group 1 was observed first or

second stage of the EOM. In 6 (13.9%) patients was diagnosed catarrhal stage and in 9 (20.9%) - the secretory one.

The opposite pattern was observed for children of the second group: 1 patient (2.8%) patients had a catarrhal, 19 (52.8%) - secretory, 12 (33.3%) - mucosal and 2 (5.6%) - fibrinous stage.

Catarrhal stage of EOM characterized by retraction of the eardrum, the shortening of the light reflex, and at least - infiltration of the tympanic membrane. Audiology studies in patients with catarrhal stage of EOM have shown that air sound conduction thresholds reach values of 20 dB, and the thresholds of bone - remained within normal limits. In patients with predominantly observed impedance C, at least a B-type tympanogram, which is characteristic of the auditory tube dysfunction, and, hence, the negative pressure in the tympanic cavity. It was also absent acoustic reflexes.

In patients with serous stage of EOM there were noted retraction of the eardrum, its opacity (sometimes with a yellowish tint), and also determined the exudate level. Air sound conduction thresholds were in the range of 20-30 dB, bone thresholds remained within normal limits. At the impedancemetry equally often identified the C-and B-type of tympanograms. Absence of acoustic reflexes had also been observed.

In patients with mucosal stage of EOM otoscopic pattern was characterized by retraction of the eardrum which had bluish color, uneven infiltration, immobility, and sometimes - a bulging in the lower quadrant. Air thresholds ranged between 30-40 dB, bone thresholds - up to 10 dB at high frequencies. At the impedancemetry determined mainly B-type of tympanogram while the absence of acoustic reflexes.

In 2 patients with fibrous stage of EOM at otoscopy the eardrum looked pale and drawn, with scar changes and developments of timpanosclerosis. In audiogram the air thresholds reached 35-50 dB, the bone thresholds - 15-20 dB. At impedancemetry detected type B of tympanogram, acoustic reflexes were absent.

According to the author [2], if the child has the disease of the nasal cavity, paranasal sinuses and nasopharynx it significantly increases the risk of EOM. Our results do not contradict, but rather to confirm the above conclusions. For example, in contrast to the control group in patients with adenoid vegetations, purulent sinusitis, vasomotor rhinitis, and curvature of the nasal septum, significantly increases the risk of the EOM ( $p < 0.05$ ) and in 28.8% of cases leads to the development of EOM.

Statistically significant ( $p < 0.01$ ) is the position that the simultaneous presence (combination) of 2 or more of the above pathologies dramatically increases the risk of EOM (up to 95%).

The negative impact of mixed pathologies is not limited to increased risk of the EOM. The second negative point is that in children with the EOM on the background of a combination of diseases of the nasal cavity, paranasal sinuses to the nasopharynx, the nature and extent of lesions of the middle ear and hearing is much higher than in children with the EOM on the background of a single disease [2, 5, 6].

With increasing of duration and chronisation of disease, there is a shift to the next stage of EOM, which

certainly reduces the effectiveness of not only conservative, but surgical treatment. In this regard, it is difficult to overestimate the importance of early diagnosis of the EOM in children [3, 6].

Thus, it becomes obvious conclusion, that if the presence in a child of several pathologies (diseases of the nasal cavity, paranasal sinuses, and nasopharynx) is a prerequisite for further study of hearing. The combination of 2 or more of these diseases dictates the need to include the study of hearing ability in the compulsory examination of such patients. This will facilitate both early diagnosis and treatment efficiency of EOMs in HIV infected children, which, of course, lead to a significant reduction in the number of complications, as the EOM in HIV infected children can be a source of persistent hearing loss, which has an adverse effect on the formation of speech and the overall development of the child.

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