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ТИББИЁТДА ЯНГИ КУН
НОВЫЙ ДЕНЬ В МЕДИЦИНЕ
NEW DAY IN MEDICINE

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ANALYSIS OF THE MICROFLORA OF THE NASO-THROAT IN CHILDREN WITH ADENOIDITIS

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✓ ***Resume***

Adenoids in children - the most common disease of the upper respiratory tract in ENT practice. Children subject to adenoid vegetations up to 15 years. Most often the disease develops at a younger age - from 3 to 7 years adenoid vegetation disrupts nasal breathing, provokes the development colds. With adenoids, mucous discharge from the nose and in pharynx. Infection from the adenoid region can move to nearby "territories": the pharynx, bronchi and sinuses. Adenoids severe degree can even change the appearance of a person, and not in better side: the face becomes swollen and pale, nasolabial the folds are smoothed out, the mouth is constantly ajar, and the lips are cracked.

Key words: adenoids, adenotomy, children, tonsils, nasopharynx.

ADENOIDITLI BOLALARDA NASO-TOMOQ MIKROFLORALARINI TAHLILI

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Samarqand davlat tibbiyot universiteti O‘zbekiston

✓ ***Rezyume***

Bolalardagi adenoidlar – otorinolaringolog faoliyatida eng keng tarqalgan yuqori nafas yo'llarining kasalligidir. 3 yoshdan 15 yoshgacha bolalar adenoid vegetatsiyasiga moyil bo`ladi. Ko'pincha kasallik 3 yoshdan 7 yoshgacha bo`lgan bolalarda rivojlanadi adenoid vegetatsiyalari burun orqali nafasni buzadi, tez-tez shamollashga olib keladi. Adenoidlarda burundan va halqumdan shilliq ajralishi kuzatiladi. Adenoidlardan infektsiya yaqin atrofda joylashgan "hududlar": halqum, bronxlar va burun bo`shliqlariga o`tishi mumkin Adenoidlarning og'ir darajalarida hatto odamning tashqi qiyofasi ham albatta salbiy tomonga o'zgarishi mumkin, : yuz shishib, oqaradi, burun-lab burmalari tekislanadi, og'iz doimo yarim ochiq, lablar esa yorilib ketadi.

Kalit so'zlar: adenoidlar, adenotomiya, bolalar, bodomsimon bezlar, Burun-halqum.

АНАЛИЗ МИКРОФЛОРЫ НОЗОГЛОТЫ У ДЕТЕЙ С АДЕНОИДИТОМ

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✓ ***Резюме***

Актуальность темы: аденоиды у детей – самое частое заболевание верхних дыхательных путей в ЛОР-практике. Дети подвержены аденоидным вегетациям до 15 лет. Наиболее часто заболевание развивается в младшем возрасте – от 3 до 7 лет Появление аденоидных вегетаций нарушает дыхание носом, провоцирует развитие простуды. При аденоидах наблюдаются слизистые выделения из носа и в глотке. Инфекция из области аденоидов способна переходить на близлежащие «территории»: глотку, бронхи и носовые пазухи. Аденоиды тяжелой степени могут менять даже внешний вид человека, и причем не в лучшую сторону: лицо становится отекшим и бледным, носогубные складки сглаживаются, рот постоянно приоткрыт, а губы трескаются.

Ключевые слова: аденоиды, аденотомия, дети, миндалины, носоглотка.

Relevance

According to many studies, chronic adenoiditis (SA) has a polietiological nature. In this regard, environmental factors, anatomical and physiological characteristics, susceptibility to allergies, etc. are considered in the literature. However, the microflora of adenoid tissue which plays the most important role in children not studied . First of all, it is necessary to consider the importance of viral, bacterial, fungal infection.

Pathogens of acute respiratory diseases (ARD), entering the tissues covering the respiratory tract (including the lymphoid tissue of the nasopharynx), affecting the mucous membrane, migrating into all layers causes epithelial dystrophy, damages the floating epithelium, creates "bald" areas and disrupts its function, leads to the addition of bacterial flora and the appearance of repeated viral infections. There is an opinion that recurrent acute respiratory infections lead to disruption of regeneration processes and increased infiltration of the mucous membrane. In some areas of the laryngeal tonsil, the degree of infiltration is so great that the boundaries between the epithelium and the parenchyma of the tonsils disappear. Damage to the basal membrane and mucosal layer itself induces the secretion of transforming growth factor by fibroblasts, which leads to tonsillar tissue hyperplasia [4].

In the development of pathological changes in adenoids, lymphotropic viruses are of great significance: Epstein-Barr virus (EBV), herpes simplex type 1 and 2 (OGV 1,2), cytomegalovirus (SMV), infection with adenoviruses, possibly infection during pregnancy, play an important role. . The effect of pathogens on the body is a violation of the apoptosis mechanism of lymphocytes, which leads to severe hypertrophy of tonsils and lymph nodes [3].

Thus, EBV, which has lymphotropic properties, mainly affects V-lymphocytes. Nasopharyngeal epithelial cells, T lymphocytes, macrophages, and neutrophils also serve as target cells for EBV. The effect of the virus on the body can be acute or chronic (depending on the course of the process) and leads to the formation of a state of immunodeficiency and is manifested by symptoms of an infectious disease [1,5].

Currently, the EBV infection rate of the population of different countries reaches 80-100%. Doctors are faced with clinically manifested forms of primary EBV infection in the form of acute undiagnosed respiratory tract infection (more than 40% of cases) or infectious mononucleosis (about 18% of all diseases).

Otorhinolaryngological manifestations of EBV infection are characterized by severe hypertrophy and damage to the laryngeal tonsil followed by the formation of CA with persistent nasopharyngeal obstruction [6,9]. According to a number of authors, the persistence of EBV in the tissue of adenoid vegetations is considered as a factor in the transition of the inflammatory process to chronicity and corresponds to 15-20% of cases [2,7,8,10].

Purpose of the study: Analysis of the microflora of the naso-throat in children with adenoiditis

Materials and methods

The research work was carried out from 2020 to 2022 at the Pediatric Department of the SamDTU multidisciplinary clinic and the consultative diagnostic polyclinic of the SamDTU multidisciplinary clinic.

From 2020 to 2022, 154 children with CA between the ages of 4 and 14 were examined. The main criteria for the inclusion of children in the study was the presence of CA (clinical signs of inflammation of the tonsils of the larynx lasting more than 2 months with exacerbations more than 3 times per year):

- more than 6 times a year for all age groups
- children without severe accompanying disease comorbidities (congenital heart defects, diabetes, developmental defects, and hypothyroidism).

Exclusion criteria from the study:

- Under 4 years old and over 14 years old

The age and gender content of the examined children is presented in the table.

Children's age was from 4 to 14 years , of which 96 (55%) are boys and 78 (45%) girls children _ It 's a lot children the number was from 4 to 6 years old - 100 (57%) people, from 6 to 9 years old - 45 (26%) people , from 11 to 14 years old There were 29 (17 %) children .

Table 1

Distribution of patients by age and sex

Gender	4-6 years old	7-10 years old	11-14 years old	Total
Boys	19(28.7%)	14(29%)	4(8%)	49(61%)
Girls	9(14%)	12(18.%)	8(12%)	29(39%)
Total	28(42.4%)	26(39.4%)	12(18.1%)	7 8(100%)

Research methods: Endoscopic examination of the nasal cavity and nasopharynx in children was carried out in a sitting position using a flexible or rigid optic with a diameter of 2.7 mm from Karl Storz (Germany) company (viewing angles 0 º 'z and 30 º). Nasal mucosa was previously anemized with 0.1% or 0.05% xylometazoline solution. Then application anesthesia was performed with 10% lidocaine solution by spraying it. The examination begins with the insertion of an endoscope or rhinofibroscope through the lower nasal passage, attention is paid to the color of the mucous membrane of the back of the lower nasal concha, the amount and nature of the discharge in the common and middle nasal passages. As the endoscope passes into the nasopharynx, the size of the posterior ends of the lower nasopharynx, as well as the position of the nasopharyngeal tonsils and the entrance of the auditory tubes were assessed. At the same time, the size of the nasopharyngeal lymphoid tissue compared to the larynx, its compatibility with the choanae, the presence or absence of a block of the ends of the auditory tubes were determined.

The following classification was used to assess the degree of hypertrophy of the laryngeal tonsil: level 1 - lymphoid tissue occupies an area of no more than 1/3 of the size of the pharynx, level 2 - up to 2/3 of the pharynx and grade 3 - covering more than 2/3 of the trachea or completely covering the alveolar cavity.

According to the generally accepted rules, the anesthetic test was carried out 15 minutes before the study by instilling 1 drop of anesthetic under the tongue.

It is obtained from the surface of adenoid vegetations Bacteriological examination of microflora was carried out in the clinic-diagnostic laboratory of the multidisciplinary Samarkand State Medical University (head of the laboratory – NR Jabbarova). The sensitivity of the microflora to antibiotics was also determined. The material for examination was taken from the nasopharynx on an empty stomach, after examination of the ENT organs, through the mouth with a sterile cotton probe bent at an angle of 120 º. The probe was inserted up to the nasopharyngeal dome without touching the teeth, the dorsal surface of the tongue and the tonsils of the palate. The material was placed in a sterile disposable test tube and sent to the bacteriological laboratory and kept in a thermostat at a temperature of +46 º C for 3 hours. Then the material was planted in a Petri dish with nutrient medium. The following media were used to obtain a pure culture and determine the amount of microorganisms: blood agar, egg yolk-salt agar, Endo, Saburo and Schauler's media.

Serological and molecular biological diagnostics was carried out in the multidisciplinary laboratory of the SamDTU clinic (head of the laboratory - Dzhabbarova NR)

The following infections were examined in TKB with CA: herpes group *(OGV 1,2, EBV, sMV, VGCh 6 type)*, atypical pathogens *(C.pneumoniae* and *Mpneumoniae).* We determined the titers of specific antibodies in the blood by the IFA method, and also determined the DNA of pathogens in the nasopharyngeal swabs by the PSR method.

We detected simple herpes virus type 1 and 2 using Anti-HSV-1 ELISA, EUROIMMUN AG and Anti-HSV-2 ELISA, EUROIMMUN AG, GmbH methods. The results were evaluated using semi-quantitative and quantitative methods. The interpretation of the results when evaluated by a semi-quantitative method was as follows: the result is negative < 0.8; threshold > 0.8 to < 1.1; positive > 1.1. When evaluated by quantitative method - up to 16 Od/ml - negative result, 16 - 22 Od/ml - suspicious result, more than 22 Od/ml - positive result.

Diagnosis of Epstein-Barr virus infection was based on detection of specific antibodies against capsid antigen (IgG-VCA), early (IgG-YeA) and core antigen (IgG-EBNA) by ELISA, EURO IMMUN methods. The interpretation of the results was as follows: the result is negative < 0.8; threshold > 0.8 to < 1.1; positive > 1.1. When evaluated by quantitative method - up to 16 Od/ml - negative result, 16 - 22 Od/ml - suspicious result, more than 22 Od/ml - positive result. Detection of

EBV-infection in the kit of the company "Sanofi Diagnostic Pasteur" (France) diagnostic antibody titer: VCA IgM 1:10; VCA IgG 1:160; EA was also performed with IgG 1:20 detection.

In order to detect SMV infection, qualitative assessment of IgG and IgM antibodies was carried out using the "HUMAN" immunoenzyme method. The interpretation of the data is as follows: if the optical density is greater than or equal to the value of cut-off +15% in the test tube, the result is considered positive. If the optical density is less than the cut-off+15% value in the test tube, the result is considered negative.

RESEARCH RESULTS

The main complaints reported by parents and patients with CA (medical history data): difficulty breathing through the nose, snoring, frequent ORK (more than 6 times a year), hearing loss, catarrh, frequent observation of cases of purulent and exudative otitis (more than 2g'3 in one year), signs of postnasal syndrome (feeling of discomfort and mucous discharge along the back wall of the larynx), long-term subfebrile temperature. In inspection of 49 (86%) children height in lymph in the field it was found that the lymph nodes are enlarged.

Statistically significant differences were found in the obstetric and family history survey data (Table 4) .

Table 4

Obstetric anamnesis and family anamnesis

Anamnesis data	Main group	Control group
Pathological course of pregnancy	40	3
presence of EBV and si megalovirus during pregnancy	19	0
Pathological course of childbirth	20	3
Chronic ENT diseases in the family	39	5

The pathological course of pregnancy was observed in 28% of mothers of seropositive patients, which is statistically significantly higher than that of seronegative children (9.7%) ($r<0.05$). The presence of chronic herpesvirus and/or atypical infection in the mother during pregnancy was 13.3% in the main group, no herpesvirus and/or atypical infections were detected in any mother during pregnancy in the control group ($r<0.05$). In the main group of patients, an important fact was revealed about the high frequency of infection of close people (parents, siblings) with herpesviruses and/or atypical pathogens (71.3%), while in the control group only two families (6.5 %) had cases of herpesvirus and/or atypical infection ($r<0.01$). It was found that the mothers of patients of the main group had a lot of pathological childbirth (13.9%), while in the control group it was observed in mothers of 8.5% of patients; also, cases of chronic ENT infections such as tonsillitis, sinusitis, otitis were found in a large number of family members (27.3%) of children of the main group: in the control group, only five (16.1%) family members had chronic ENT infections. However, the above differences are not statistically significant.

Table 5

Degree of enlargement of the laryngeal tonsil (main group)

Age (in years)	Hypertrophy rate N =143	Laryngeal tonsils (100%)
	II - level	Level III
4-6	29 (20.3)	53 (37.1)
7-10	17 (11.9)	21 (14.7)
11-14	15 (10.5)	8 (5.6)
Total	61 (42.7)	82 (57.3)
	143 (1 00%)	

In the main group, III degree of hypertrophy of adenoid vegetations was observed mostly (57.3%), II degree of hypertrophy of adenoid vegetations was found in 42.7% of patients. 73.4% of patients in the main group had a purulent form of CA, 26.6% of children had a swelling-catarrhal form of CA .

The following changes were observed in the control group of patients: the hypertrophy of the laryngeal tonsil was less marked, which was manifested by the percentage of patients with hypertrophy of adenoid vegetations of the II degree (58%), the enlargement of the laryngeal tonsil of the III degree in 42% of children. was determined.

Table 6

Laryngeal tonsil enlargement rate (control group)

Age (in years)	degree of laryngeal tonsil hypertrophy, N=31 (100%)	
	II - level	Level III
4-6	10 (32.2)	8 (25.8)
7-10	4 (12.9)	3 (9.7)
11-14	4 (12.9)	2 (6.5)
Total	18 (58.0)	13 (42.0)
	31 (100%)	

In both groups of children, we examined the microflora on the surface of the tonsils of the larynx. A total of 169 strains were studied in the main group and 28 in the control group. The content of microflora **in the studied groups (Table 7).**

Most identified pathogens in children of the main group:

1. S. aureus - 40 (28%);
2. M. catarrhalis - 39 (27.3%);
3. S.pneumoniae - 29 (20.3%);
4. H. influenzae -27 (18.9%).

Most identified pathogens in children of the control group:

1. *S. aureus - 6 (19.3%);*
2. *H. influenzae - 6 (19.3%);*
3. *S.pneumoniae - 4 (12.9%);*

7 tables

Specific composition of microflora in children with SA (n= 174)

Pathogens	Main group n=143 (100 %)	Control group n=31 (100%)
Mixed flora	34 (23.8)	4 (12.9)
S. aureus	40 (28.0)	6 (19.3)
S. pneumoniae	29 (20.3)	4 (12.9)
H. influenzae	27 (18.9)	6 (19.3)
S. epidermidis	5 (3.5)	1 (3.2)
S. pyogenes	9 (6.3)	1 (3.2)
S. saprophyticus	7 (4.9)	1 (3.2)
M. catarrhalis	39 (27.3)	2 (6.5)*
Candida spp.	4 (2.8)	2 (6.5)
No flora growth	10 (7.0)	5 (16.1)
Other microflora	4 (2.8)	2 (6.5)

In the main group, the most common pathogenic microflora is S.aureus - 28% and S.pneumoniae - 20.3% was found . The main difference of M. satarrhalis , in terms of composition, was revealed more in the main group than in the control group (respectively, 6.5% and 27.3%) ($r<0.05$) (Figure 1) .

Figure 1. 3rd degree hypertrophy of adenoid vegetations, exacerbation of CA, infection with M. *catarrhalis*

Clinical examination and endoscopic examination of the main group of children, in which M. satarrhalis was isolated from nasopharyngeal swabs, showed that during this period, the purulent form of SA increased in 71.8% of patients.

Dominant transient flora is represented by H. influenzae and was shown in the same percentage in children of the main (18.9%) and control (19.3%) groups.

In the microbiological examination of nasopharyngeal microflora in the main group of patients, the following features were revealed: 23.8% of children had a microbial association, 69.2% of patients had a monoculture, 7% of patients had no growth of microflora

In the control group, the association of microorganisms was revealed in fewer cases (12.9%). Monoculture was detected in 71.3% of cases, microflora growth was not observed in 16.1% of children.

The presence of markers of atypical infections (M. pneumoniae, C. pneumoniae) and herpesviruses (OGV1,2, sMV, EBV, GVCh type 6) was found in TKB with SA using IFA. The results were evaluated together with an infectious disease specialist-pediatrician. Atypical pathogens and/or herpesviruses were detected in 143 examined children (main group), in the control group (31 children) no atypical and herpesvirus infection markers were detected. Predominance of herpesvirus infection was observed: sMV - 43.4%, EBV - 42.0% and VGCh 6 type - 42.0%, VPG 1.2 type - 35.0%. Pathogens of atypical infections were identified in fewer cases: M. pneumoniae - 24.5%, C. pneumoniae - 26.6%. Mixed infection was observed in 53.1% of children. Smv infection contains a combination of herpesviruses (50%); also the combination of herpesviruses and atypical pathogens prevails (46.1%). A rare (3.9%) mixed intracellular infection is detected

Analysis of data obtained from the study of nasopharyngeal smears in patients with chronic adenoiditis using the PSR method showed significant specificity for VGCh type 6, EBV, sMV, which emphasizes their lymphotropic nature. The highest percentage of DNA detection by the PSR method (37.8%), with a positive IFA result (42%) was found in patients with VGCh type 6. Less concordance of IFA/PSR results was observed in infections such as EBV (42% and 29.4%, respectively) and sMV (43.4% and 25.9%, respectively). The special role of VGCh type 6 in the formation of SA that we identified should be emphasized, but according to the literature, this aspect is given little attention and undoubtedly requires further study.

Analyzing the prevalence of infection depending on the degree of hypertrophy of the laryngeal tonsils (Table 13), the following features were revealed: in most of the examined patients ($r<0.05$) in the case of atypical monoinfection (23.0%), grade II hypertrophy of the laryngeal tonsils was noted , atypical monoinfection was detected in 6.1% of children with grade III hypertrophy of tonsils and herpesviruses prevailed.

8 tables

Variants of infection depending on the degree of hypertrophy of laryngeal tonsils in the main group of patients (N = 143)

Options for infection	Degree of hypertrophy of laryngeal tonsils	
	Hypertrophy of adenoid vegetations II degree	Hypertrophy of adenoid vegetations III degree
	N = 61 (100 %)	N = 82 (100 %)
Herpesviruses (monoinfection) _	17 (27.9)	31 (37.8)
Association of herpesviruses	14 (23.0)	24 (29.3)
Herpesviruses and atypical infections _	15 (24.6)	20 (24.4)
Atypia k (monoinfection)	14 (23.0)	5 (6.1)*
Type A infection association	1 (1.6)	2 (2.4)
Total	61(100)	82 (100)

The majority of patients diagnosed with hypertrophy of adenoid vegetations of the III degree (67.1%) were infected with herpesviruses (monoinfection - 37.8%, combination of herpesviruses - 29.3%).

However, herpetic infection was less frequently detected in II degree of laryngeal tonsil hypertrophy (50.9%) - monoinfection in 27.9% of patients, combination of herpesviruses in 23% of children.

A combination of herpesviruses and atypical pathogens, as well as a combination of atypical pathogens, was detected in patients with II degree (24.6% and 1.6%, respectively) and III degree (24.4% and 2.4%, respectively) of laryngeal tonsil hypertrophy .

Thus, infection with herpesviruses and atypical pathogens contributes to the increase of pathogenic and conditionally pathogenic bacteria in the nasopharynx.

Infection _ in the composition of herpesviruses makes superiority does _ In 50% of patients - smv-infection was detected . Herpesviruses _ and of herpesviruses of atypical microflora with combination superiority does _ Lymphotropic effect showing herpes viruses and their atypical flora with unification mas i of the nasopharynx lymphoid tissues of size significant level to increase take will come Infection of the process constant shape all to pathogens is typical . smv of infection persistence stage to the advantage (41.3%) separately attention _ _ to be given should be , this is probably atypical _ microflora and pathogen bacteria addition respectively to add to it TKB remains the " background " for CA. In nasopharyngeal ointments E BV, sMV, VGCh Diagnosis of type 6 P S R check for transfer t ausia he wished _

Conclusion

So so S A b died _ TKB held at research as a result , he is in this group patients are also atypical pathogens _ and g herpesvirus existence Contribute to the increase in ORK cases, the increase in the size of the nasopharyngeal lymphoid tissue, the dysfunction of the auditory tube and the development of exudative otitis adds _ Herpesvirus _ and / or atypical infectious in patients of the nasopharynx microbiological composition main pathogen flora (S.aureus, S.pneumoniae i H.influenzae) dominance and many cases local of flora lack of with described as well as M. satarrhalis in the purulent form of SA of statistics in terms of significant to a large extent to be determined observed .

Herpetic _ infection larynx tonsils _ _ development of hypertrophy and larynx tonsils _ _ in the tissue inflammation of the process It becomes the basis for chronic course, and later, due to its persistence, it becomes a background that allows the addition of other agents - atypical and pathogenic bacterial microflora . Herpetic _ high frequency of infection markers TKB with SA was detected both in nasopharyngeal smears and in blood IFA data . Marked features patients treatment algorithm work exit for application can.

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