The Use of IRS 19 During Respiratory Tract Infections in Atopic Children

Ekaterine Chkhartishvili, Lia Zhorzholiani**, Rusudan Karseladze**, Nino Gelovani***

*Children's Clinical Hospital #1, Tbilisi, Georgia;
**Scientific-research Institute of Pediatrics, Tbilisi, Georgia

ABSTRACT

The ecosystem of the bacterial flora in nasopharynx is the reservoir for bacterial pathogens involved in respiratory tract infection, bacteremia and meningitis. Respiratory infections are the third leading cause of death worldwide and are a priority for vaccine development. The aim of our study was: 1. to reveal some bacterial strains in nasopharyngeal flora during asthma-like symptoms accompanied other respiratory tract diseases in atopic children and, 2. to assess effectiveness of IRS 19 in complex treatment, probably, as a preventive agent against recurrent respiratory tract infections. Microbiological technology specific for microbial and fungal flora for nasopharyngeal smear culture techniques was used. On the basis of the scientific-research reports and on the results of our study, we can suggest that topical vaccines (microbial lysates) might have positive influence on nasopharyngeal flora or/and respiratory tract mucosal microbial environment.

KEYWORDS: *respiratory tract disease, nasopharynx, bacterial flora, topical vaccine*

Epidemiological and clinical studies have provided indirect evidence that infections may prevent the development of atopy and atopic disease. On the other hand, several studies suggested, that infections exacerbate established allergic diseases: e.g. bronchial asthma, airway hyperresponsiveness and atopic dermatitis. Therefore, viral and/or microbial infections and/or their products may have bi-directional effects on the development of allergy and asthma [5]. However, research into molecular mechanism(s) governing recognition and response to microbial stimuli [3,8] provides cause for cautions optimism that safe and effective methods to control these processes may be feasible in the not too distant future [4]. Perinatal risk factors are associated with lung function and respiratory symptoms in adult life. Whether the same holds for distinctive asthma features, such as bronchial hyperresponsiveness and atopy, has scarcely been studied. A severe respiratory infection in the first year of life appears associated with bronchial hyperresponsive development [7]. The bacterial flora of the nasopharynx is a complex ecological niche in a constant state of flux. Factors controlling bacterial acquisition, elimination and reacquisition in this ecosystem are poorly understood. This ecosystem is the reservoir for bacterial pathogens involved is respiratory tract infection, bacteremia and meningitis [1]. Respiratory infections are the third leading cause of death worldwide and are a priority for vaccine development [6].

MATERIAL AND METHODS

The aim of our study was: 1. To reveal some bacterial strains in nasopharyngeal flora during asthma-like symptoms accompanied other respiratory tract disease in atopic children, 2. To assess effectiveness of IRS 19 (Solvay Pharma) in complex treatment, probably, as a preventive agent against recurrent respiratory tract infections. Microbiological technology specific for microbial and fungal flora for nasopharyngeal smear culture techniques was used. We collected nasopharyngeal discharge with sterile swab during fasting or 2 hours after meal intake periods. Microbiological investigation was performed on specific chemically defined synthetic media by cultivating pathological material either in a suspension or spread out on a culture plate, receiving pure culture, as well as detecting its pathogenity, serology group establishment (for streptococcus). Several specific culture media were as follows: I. 5% blood agar, II. egg+saline agar (Chistovich medium), III. 1% sugar broth suspension, IV. Bile salt broth suspension, V. Saburo medium (to detect fungal infection). We kept them in thermostat on 37°C for 18 - 24 hours. Results were evaluated by the pathogen dispersion degree. Positive identification was accepted when growth was abundant or/and moderate.

RESULTS

A recent report evaluated a group of patients (2002-2003 years period) from 3 to 13 years old (15 boys, 5 girls) with asthma-like symptoms during: 1. Influenza complicated by pneumonia (6 patients), 2. Influenza infection with other respiratory manifestations (2 patients) and croup (12 patients) by using multiple nasopharyngeal cultures for some microbial strains detection. Of the 20 patients evaluated, 5 patients had positive S. aureus identification, and 7 patients had positive for S.pyogenes results. 5 patients were culture positive for both S.aureus or S.pyogenes and Candida albicans. Single cases were reported for Candida albicans and E.coli, S.epidermidis and Candida albicans and etiologically not significant bacterial growth was detected. According to seasonal period following was revealed: during autumn period 14 cases, summer - 2 cases, spring - 3 cases, winter 1 case. All patients reveal atopy symptoms: 9 patients were with hay fever, 7 patients were with allergic rhinitis and 4 patients were with atopic dermatitis. All patients complained frequent recurrent upper respiratory tract diseases/infections. The second - control group - included 20 patients with the same diagnosis and age group. Patients in both groups received the same routine symptomatic treatment. For preventive purposes IRS 19 was delivered after acute period of disease in every four months for two weeks in a first group of children. In general, IRS 19 was well tolerated, except for one case of skin allergic rash, which immediately disappeared without specific treatment.

After inclusion of IRS 19 in the treatment it has been revealed shortage of recovery period in patients 7±1,2 days vs 9±2,3 days in control group. Upper respiratory tract symptoms disappeared in patients in 2±0,5 days vs 6±1,1 days in control group. As for preventive effect, the

recurrence incidences of respiratory tract diseases diminished 1,7 times compared with control group. The results of microbiological investigations are given in *Tab.1*

CONCLUSION

According to update theoretical, experimental and clinical data we have to take into consideration that the exposure to microbes (as opposed to infection) in childhood protects against asthma. Microbial pattern- recognition receptors of the innate immune system are expressed on dentritic and other cells, and polymorphisms in special receptors have all been shown to influence asthma susceptibility [2].

On the basis of all above mentioned, we can suggest that topical vaccines (bacterial lysate) might have positive influence on nasopharyngeal flora or/and respiratory tract mucosal microbial environment. The use of such type of treatment should have a clinical value. However,

for relevant treatment and preventive measures there is still need for further case-control studies.

Microbe type	Treatment group				Control group			
N= cases	Before		After		Before		After	
S. aureus	5	25%	1	20%	6	30%	3	25%
S. pyogenes	7	35%	2	40%	8	40%	4	33,3%
S. aureus or S.pyogenes + Candida albicans	5	25%	2	20%	6	30%	5	41,7%
E. coli + Candida albicans	1	5%	-		-		-	
S. epidermidis + Candida albicans	1	5%	-		-		-	
Etiologically not significant	1	5%	-		-		-	
Total	20	100%	5*	100%	20	100%	12*	100%

*We also paid attention to diminished growth from abundant to moderate growth.

Tab.1 *Some datas of nasopharyngeal flora in atopic children.*

REFERENCES:

1. Cohen R.,"CESP Meeting of scientific working group", Brussels.2003
2. Cookson W.,M.D.,D.Phil., Moffatt M.,D.Phil., "Making sense of asthma genes", N Engl J Med, 2004, 351;17,pp.1794-1796.
3. Kline JN.,Waldschmidt TJ.,Businga TR.,et al,"Modulation of airway inflammation by CpG oligodeoxynucleotides in a murine model of asthma",J Immunol.,1998;160,2555-59.
4. Martinez Fd.,Holt PG.,"Role of microbial burden in aetiology of allergy and asthma", Lancet 1999;354(supplI):12-15.
5. Renz H.,Herz U.,"The bidirectional capacity of bacterial antigens to modulate allergy and asthma",Eur Respir J.,2002,Jan;19(1);158-71
6. Snelgrove R.,Williams A.,Thorpe C. et al.,"Manipulation of immunity to and pathology of respiratory infections",Expert Rev Anti Infect Ther,2004,Jun,2(3):413-26.
7. Vonk JM.,Boezen HM., Postma DS. Et al., "Perinatal risk factors for bronchial hyperresponsiveness and atopy after a follow up of 20 years", J Allergy Clin Immunol, 2004, Aug 114 (2):270-6.
8. Wright SD.,"Toll, a new piece in the puzzle of innate immunity",J Exp Med, 1999,189:605-09

Применение препарата IRS 19 при инфекциях респираторного тракта у детей с атопией

Екатерине Чхартишвили, Лиа Жоржолиани, Русудан Карселадзе, Нино Геловани

Детская клиническая больница №1, Научно-исследовательский институт педиатрии, Тбилиси, Грузия

Р Е З Ю М Е

Изучено действие препарата IRS 19 с целью профилактики инфекции респираторного тракта у часто болеющих детей с атопией. Исследована микрофлора носоглотки у детей от 3 до 13 лет (15 мальчиков, 5 девочек) с астматическим синдромом при гриппе с пневмонией, гриппе с другими респираторными проявлениями и крупе. Установлено, что при комплексном лечений с включением IRS-19 периоды выздоровления и исчезновения симптомов верхних дыхательных путей сокращаются. Уменьшается число случаев заболевания. Мы разделяем мнение авторов, считающих, что экспозиция микробами (бактериальные лизаты) имеет положительное влияние на микрофлору носоглотки и/или на микробную среду слизистой респираторного тракта. Этот метод лечения следует признать эффективным.

Ключевые слова: *инфекции респираторного тракта, вакцины, микрофлора носоглотки*