

Bilous T., Bilyk G. A.

## INDICES OF EXHALED BREATH CONDENSATE IN CHILDREN WITH BRONCHIAL ASTHMA AND REMODELLING OF RESPIRATORY TRACT

Bukovinian State Medical University, Chernivtsi, Ukraine  
Department of Pediatrics and children infectious diseases  
(scientific advisor - M.D. Koloskova O.)

**Introduction.** The term “remodeling” usually means changes in the structure of the tissue content occurring as a result of disorders of natural reparation mechanisms in case of their damage. As a rule, remodeling occurs in individuals susceptible to this process in case of chronic inflammation, tissue damage or combination of these factors. The signs of stable vascular alternation of the respiratory tract in case of bronchial remodeling are determined by their hypertrophy and angiogenesis manifested by 2-3 times increased number of vessels in the area of small and middle-size bronchi. Increased permeability of the vascular wall, stagnation phenomena and increased general volume of the vascular bed are accompanied by bronchial obstruction, persisting inflammation, increased temperature on the mucous surface with increased concentration of nitrogen monoxide in the exhaled breath. All these factors promote hyperactivity of the bronchi, their reduced function, intensified course of the disease, and in some extent it influences upon the efficacy of treatment. Thus, aim of research was to detect the content of remodeling markers of the respiratory tract in the exhaled breath condensate of children suffering from bronchial asthma.

**Materials and Methods:** The study was in clinical groups of children with bronchial asthma (BA) were formed on the indices in sputum supernatant: the I group - “a high risk group” of bronchial remodeling (37 patients with VEGF more than 80 ng/ml, and MMP-9 more than 5,2 ng/ml), the II group “a moderate risk” of bronchial remodeling (41 patients with VEGF more than 80 ng/ml, and MMP-9 less than 5,2 ng/ml, or VEGF less than 80 ng/ml, and MMP-9 - more than 5,2 ng/ml), the III group “a low risk” of bronchial remodeling (38 patients with VEGF did not achieve 80 ng/ml, and MMP-9 - less than 5,2 ng/ml).

**Results:** The results obtained enable to believe that in exhaled breath condensate of children with a high risk of bronchial remodeling was higher azoalbuminolysis (1,8 ml/h comparison of II group - 1,5 ml/h,  $p=0,038$ , and III group - 1,4 ml/h,  $p=0,007$ ), high catalase activity (81,26 comparison of other group - 50,7,  $p=0,06$ , and 47,07,  $p=0,052$  mcmol/min•mg of protein). Also in the I clinical group the content of nitrogen monoxide metabolites (53,5 mcmol/L) comparison of II group of children (48,7 mcmol/L,  $p=0,28$ ) and the III group (41,7 mcmol/L,  $p=0,085$ ).

**Conclusions.** In children with a “high risk” of respiratory tract remodeling more significant inflammatory process in the bronchi is found than in children with a “low risk”.

Chandarana N.

## GENDER-SPECIFIC PECULIARITIES OF THE BRONCHIAL ASTHMA PHENOTYPES IN CHILDREN AFTER PUBERTY ONSET

Bukovinian State Medical University, Chernivtsi, Ukraine  
Department of Pediatrics and Childhood Infectious Diseases  
(scientific advisor - Ph.D. Bogutska N.)

Bronchial asthma (BA) is a complex disease with sex-specific differences in prevalence, in particular BA is far more common in boys than girls during early childhood, but the prevalence equalizes between the genders during adolescence. The investigations in order to examine the effect of gender-specific differences in changes of BA prevalence and phenotypes in post puberty are actual.

Purpose of the scientific work was to study sex differences of manifestations of the BA regarding prevalence of asthma phenotypes in post-puberty adolescence.

Seventy one children of post puberty period (Tanner stage  $\geq 2$ ) up to 18 years old (24 females and 47 males) with at least one year duration of persistent BA were examined (average age  $14,9 \pm 1,3$  years old). Clinico-anamnestic, allergologic, spirometric and statistical methods of research were used.

In the examined cohort late onset BA phenotype (debut after 6 years old) slightly predominated in post-pubertal females as compared to males (RR=1,1; 95%CI:0,4-2,8). Early onset BA (up to 3 years old) non significantly associated with male gender (RR=1,4; 95%CI:0,9-2,0). Post-puberty period in females associated with non significantly increased risk of severe BA phenotype as compared to males (RR=1,1; 95%CI:0,3-3,6). Atopic (allergic) BA predominated in males (RR=1,4; 95%CI:1,0-1,9), while non-atopic phenotype associated with female gender in post-puberty (RR=1,4; 95%CI:0,8-2,7). Max skin papula to the epidermal allergens and genealogic index of positive allergic familial anamnesis predominated in males as compared to females in post-puberty ( $15,1 \pm 8,3$  and  $12,8 \pm 6,6$  mm ( $p=0,34$ );  $0,16 \pm 0,09$  and  $0,127 \pm 0,06$  units ( $p < 0,03$ ) respectively). Exercise induced asthma was almost equally distributed among both sexes (RRmales=1,0; 95%CI:0,6-1,8). No any significant differences of the spirometric indices were revealed in groups of children depending on gender (bronchial lability index (FEV1, %) -  $17,9 \pm 13,9$  and  $18,6 \pm 13,9$  ( $p=0,12$ ); PC20H (mg/ml) -  $2,5 \pm 4,0$  and  $0,8 \pm 0,8$  ( $p=0,24$ ) in males and females respectively). After puberty risk of hospitalization to emergency department due to BA exacerbation in females non significantly increased as compared to males (RR=1,8; 95%CI:0,7-3,1). Males tended to have higher birth weight as compared to females ( $3465,0 \pm 495,0$  versus  $3150,0 \pm 578,0$  g,  $p < 0,03$ ) and no differences of actual BMI in groups of comparison were revealed ( $22,0 \pm 5,7$  versus  $21,2 \pm 3,5$  kg/m<sup>2</sup>,  $p=0,56$ ).

Thus, post-puberty in asthmatic children associated with predominance of early onset BA with debut before 3 years old and atopic asthma phenotype in males and increase of risk of hospitalization to emergency department due to asthma exacerbation in females. Equal distribution of the exercise induced and severe asthma phenotype among both sexes after puberty is to be taken into account by pediatricians.

**Міністерство охорони здоров'я України  
Вищий державний навчальний заклад України  
"Буковинський державний медичний університет"  
Студентське наукове товариство  
Рада молодих вчених**



**2017, випуск 19**

---

Всеукраїнський медичний журнал молодих вчених  
Заснований у 2000 році

---

**Головний редактор**

д.мед.н., проф. Т.М.Бойчук

**Заступник головного редактора**

к.мед.н., доц. О.А.Тюленева

**Відповідальні секретарі:**

С.Л. Говорнян

д. мед. н., проф. І.С. Давиденко,

д. мед. н., проф. Ю.Є. Роговий,

д. мед. н., проф. В.К. Тащук,

д. мед. н., проф. О.І. Федів,

д. мед. н., проф. О.С. Федорук,

д. мед. н., проф. Р.Є. Булик,

д. мед. н., проф. Н.В. Пашковська,

к. мед. н., доц. М.П. Антофійчук.

---

**Адреса редакції:** 58002, Чернівці, пл. Театральна, 2, СНТ БДМУ.

Тел./факс: (03722) 3-52-62; (0372) 55-17-39. E-mail: [snt@bsmu.edu.ua](mailto:snt@bsmu.edu.ua)

Повнотекстова версія журналу представлена на сайті: <http://bim.co.ua/>

**Чернівці, 2017**



Матеріали IV Міжнародного  
медико-фармацевтичного  
конгресу студентів і молодих вчених

---

Материалы IV Международного  
медико-фармацевтического  
конгресса студентов и молодых учёных

---

Abstract Book of 4<sup>th</sup> International  
Medical Congress for Students and  
Young Scientists