

# State of Sexual Development of Boys with Bronchial Asthma

**Kuldashev Sardor Furqatevich**

Assistant of Pediatrics No. 3 and Medical Genetics  
Samarkand State Medical University

**Normakhmatov Baxtiyor Botiraleyevich**

Assistant of Pediatrics No. 3 and Medical Genetics  
Samarkand State Medical University

**Annotation:** One of the risk factors for mental retardation among somatic diseases in boys is bronchial asthma.

**The purpose of the study:** to study the features of PR in pubertal boys with bronchial asthma.

**Materials and Methods:** The study included 56 boys with bronchial asthma aged 11 to 16 years.

**Results:** It was revealed that bronchial asthma in boys is accompanied by mental retardation, which is characterized by a decrease in the size of the genital organs and the late appearance of other secondary sexual characteristics and a decrease in the level of the main hormones that regulate the sexual function of boys (T, LH, FSH).

**Key words:** bronchial asthma, sexual development, sex hormones.

Violation of sexual development (PD) cannot be considered as a narrowly medical problem. Its social aspect is well known [2].

Puberty is an important component of the complex process of morphofunctional improvement in adolescence and ends with puberty. Four groups of factors take part in the regulation of puberty: genetic, endocrine, somatic, and environmental factors. Changes in any of these groups accelerate or slow down the normal course of the puberty process [1,2,5,6,7].

Retardation of sexual development (SPR) is detected during puberty, when the gonads begin to produce sex hormones. The degree of ZPR depends on at what age and at what stage of puberty an adverse effect was made. It can be caused by diseases suffered in childhood and puberty. Knowing the risk factors for mental retardation will in many cases prevent this pathology, as well as take them into account when choosing treatment methods.

One of these risk factors for mental retardation is chronic hypoxia during puberty against the background of somatic diseases. Bronchial asthma is a common disease in childhood. However, its severity, the development of complications, the consequences in terms of delayed physical and sexual development put the disease into the category of topical ones [3,4,8]. This course of the process is facilitated by persistent severe bronchial asthma, the lack of proper dispensary observation. In these cases, the underlying disease is accompanied by significant hypoxia.

**Purpose of the study:** To study the features of PR in pubertal boys with bronchial asthma.

**Materials and methods**

The study involved 56 boys with bronchial asthma aged 11 to 16 years in the acute phase.

The degree of sexual development of patients was assessed in accordance with the stages of sexual development according to Tanner. When assessing the PR of boys, the severity of pubic (P) and axillary hair growth (Ax), the size of the penis and testicles were determined. In sick children with bronchial asthma, the basal level of hormones in the blood serum was determined: FSH, LH and testosterone (T). The determination of hormones was carried out using standard kits from the company "Human" by ELISA at the Central Scientific Research Laboratory of the Tashkent Medical Academy.

**Results and its discussion**

When analyzing the features of the PR of boys with bronchial asthma, we identified the following changes (Table 1)

Table 1. Comparative dynamics of genitometric parameters in patients with bronchial asthma

Age, years		11	12	13	14	15	16
Penis	Length cm	2,7±0,12	2,89±0.09**	3.,4±0.22*	3,48±0.42**	4,5±0,13*	5,2±0,21*
		3,02±0.15	3,94±0.36	4.53±0.31	6.2±0.39	6,14±0.74	7,36±0,18
	pope r. cm	1,61±0,08	1,56±0.04*	1,8±0.10	2,01±0,14*	2,04±0,1*	2,25±0,07**
		1,5±0.06	1,88±0.1	2.10±0.11	2.47±0.11	2,46±0.13	2,8±0,05
testicle on the right	Length cm	2,3±0,2	2,55±0.11*	2,4±0.14**	2,8±0,12*	3,1±0,14*	3,28±0,12**
		2,55±0,18	3,10±0.09	3.42±0.21	3.82±0.13	3,88±0.38	4,12±0,06
	pope r. cm	1,46±0,09	1,63±0.08*	1,82±0.08*	1,98±0,06*	1,95±0,11*	2,02±0,09**
		1,26±0,08	1,82±0.07	2.12±0.11	2.26±0.09	2,41±0.14	2,75±0,07
testicle on the left	Length cm	2,22±0,23	2,4±0.09*	2,23±0.11**	2,9±0,19*	3,0±0,2	3,17±0,12**
		2,43±0.18	2.93±0.18	3.45±0.21	3.91±0.13	3,85±0.31	4,34±0,08
	pope r. cm	1,55±0,07*	1,53±0.07*	1,73±0.09	1,8±0,06*	1,84±0,08	1,93±0,09**
		1,2±0.,08	1,71±0.08	1.99±0.2	2.24±0.08	2,27±0,13	2,88±0,06

Note: \* \*\* - significance of differences in comparison with the data of the control group (P<0.05; P<0.001); - in the numerator - indicators of patients, in the denominator - healthy.

In boys aged 11 years, we did not detect significantly significant deviations from the norm in indicators reflecting the size of the penis and right testicle (P>0.1). However,



starting from the age of 12, these indicators in all examined begin to noticeably lag behind those of healthy children. So, in boys aged 12 years, the dimensions (length and diameter) of the penis are significantly less than the normative indicators, respectively  $P < 0.001$  and  $P < 0.05$ . As you know, the formation of sexual development occurs in the age range from 11 to 12 years, and the first sign of puberty that has begun is an increase in the right testicle. At the age of 12, the length of the right and left testicles was significantly less than in the control group ( $P < 0.05$ ). In the age subgroup of 13 years, these indicators also differed from the standards with significance for: the length of the penis -  $P < 0.05$ , the length and transverse size of the right testicle -  $P < 0.001$ ;  $P < 0.05$ , length of the left testicle -  $P < 0.001$ . We found a lag in all genetic parameters in patients aged 14, 15 and 16 years. Thus, in 14-year-old patients, the reliability of a decrease in the length and transverse size of the penis and the right testicle was, respectively,  $P < 0.001$  and  $P < 0.05$ , the same parameters of the left testicle -  $P < 0.001$ . In 15-year-old patients, all sizes of the penis and the volume of the right testicle were significantly reduced ( $P < 0.05$ ). The greatest lag of the studied parameters was detected in boys aged 16 years, here the significance of the difference in all parameters was highly significant ( $P < 0.001$ ).

Among the secondary sexual characteristics (SSP), in addition to determining the size of the penis and testicles, we studied such signs as pubic hair, axillary zone, facial hair and timing of oygarche. Normally, pubic hair growth begins 0.5-1.5 years after the onset of testicular enlargement, i.e. at about 12-13.5 years old. In the age subgroups of 12-14 years, this sign was not detected (P1). In patients aged 15-16 years, single sparse hairs appeared (P2). In 6 (10.7%) patients with hereditary pathology, even at the age of 16 years, pubic hair growth was absent, which corresponds to stage 1 according to Tanner. Hair growth of the axillary zone most often begins by the middle of the puberty period (at 13-15 years). In those examined at the age of 13-15 years, this symptom was not detected (Ax1). At the age of 16, single hairs appeared in this area in only 5 (8.9%) patients (Ax2). Hair on the face appears a little later on average at the age of 15 years. None of the patients examined by us had this symptom. According to the standards, oygarche becomes regular in most boys at the age of 14-15 years. Our patients did not have this symptom.

In general, ZPR was detected in 48 (85.7%) of the examined boys with bronchial asthma.

Functional disorders in the pituitary-gonadal system were confirmed by the results of studies of the content of gonadotropins and sex hormones in the blood serum (Table 2).

Table 2. The content of gonadotropic hormones and testosterone in the blood serum of boys with bronchial asthma

Index	Age, years	Compared groups			
		CONTROL		Bronchial asthma	
		M±n	n	M±n	n
FSH MIU/ml	11	0,97±0,01	6	1,74±0,02**	8
	12	3,06±0,14	10	0,93±0,15**	10
	13	3,68±0,30	7	2,5±0,45	9
	14	3,70±0,30	10	4,27±0,26	10
	15	3,16±0,21	17	2,26±0,27*	10
	16	5,2±0,047	12	2,15±0,09**	9

LG MIU/ml	11	2,5±0,36	6	1,74±0,24	8
	12	8,32±0,60	10	0,46±0,57**	10
	13	2,34±0,15	7	1,9±0,11*	9
	14	8,05±0,71	10	1,02±0,59**	10
	15	6,01±0,42	17	1,22±0,49**	10
	16	8,64±0,51	12	2,68±0,54**	9
T Nmol	11	3,56±0,59	6	3,57±0,67	8
	12	2,01±0,10	10	3,88±0,02**	10
	13	7,05±0,90	7	6,88±0,12	9
	14	9,49±0,36	10	7,8±0,42*	10
	15	17,16±1,21	17	4,58±3,02**	10
	16	13,44±1,21	12	7,78±1,34*	9

Note: \* \*\* - significance of differences in comparison with the data of the control group (P<0.05; P<0.001)

The study of the content of FSH in the blood serum, which, as is known, regulates the germinative function of the gonads in patients 11, 12, 15 and 16 years old, showed a significantly low level of this hormone (P<0.001). The concentration of LH, which mainly regulates the hormone-forming function of glandulocytes in all age groups, starting from 12 years old, was also significantly low compared to the control (P<0.05; P<0.001). The study of testosterone content showed that in the group of boys, also starting from the age of 12, this indicator was significantly reduced compared with the indicators of healthy children (P<0.05; P<0.001).

In general, our study showed that boys with bronchial asthma had a developmental disorder, which was clinically manifested by a delay in the onset of runway and a significant decrease in the level of gonadotropins and T in serum, which allows us to broaden our understanding of this issue.

Thus, the results of the study made it possible to conclude that bronchial asthma adversely affects the sexual development of boys, which highlights new aspects of this problem and dictates the need to develop targeted therapeutic and preventive measures.

**Conclusions:** With bronchial asthma in boys of pubertal age, clinical signs of mental retardation were revealed: a decrease in the size of the genital organs and the late appearance of the rest of the runway.

Revealed a decrease in the level of the main hormones that regulate the sexual function of boys: T, LH, FSH.

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