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Buznytska O. V.

LABORATORY INDICATORS OF THE FATTY LIVER DISEASE IN ADOLESCENTS WITH METABOLIC SYNDROM

Scientific director professor Strashok L. A.
Department of Pediatrics №2
V. N. Karazin Kharkiv National University

Relevance. Currently, nonalcoholic fatty liver disease (NAFLD) is one of the most common chronic liver diseases in the world. NAFLD is one of the criteria for metabolic syndrome (MS).

Goal of our research: To improve the noninvasive diagnosis for progression of fatty liver disease in adolescents with signs of metabolic syndrome.

Methods. On the base of SI "Institute of children and adolescents health care of the NAMS" were inspected 200 patients with obesity and common signs of MS (criteria of IDF, 2007) in age 14–18 years and 30 healthy children for control group. Investigation of liver fibrogenesis consisted of measurement in blood serum of level Fibronectin («Биохиммак»), serum collagen type IV («Argutus Medical»), N-terminal propeptides of type I collagen (N-TP) («Biomedica»). C-terminal telopeptides of type I collagen (C-TT) («Immunodiagnostic Systems Ltd») is index of fibrolysis. Statistical processing was made by program «Stadia-6».

Results and discussion. It was found that 100 (50,0%) patients had the main signs of MS, the rest 100 children with obesity were without MS. The study of liver fibrogenesis revealed a significant increase in levels of type IV collagen and fibronectin in adolescents with obesity ($p < 0,05$), (Table 1). The levels of fibronectin blood significantly differed in groups MS + and MS -, which apparently indicates a more severe liver damage in children with MS ($p < 0,05$).

Table 1. Levels of collagen type IV, fibronectin in adolescents with obesity ($M \pm \sigma$).

Adolescents with obesity	Collagen type IV, mkg/l	Fibronectin, mkg/ml
MS +	107,61 ± 7,04*	115,86 ± 7,20* **
MS –	103,76 ± 8,31*	93,00 ± 6,31*
Control group	85,91 ± 2,38	78,36 ± 2,12

* Difference between patients with obesity and control group ($p < 0,05$)
** Difference between patients MS + and MS - ($p < 0,05$)

As diagnostic criteria for two physiologically diverse processes - fibrogenesis and fibrolysis, the levels of N-TP and C-TT of type I collagen, respectively, were determined. The serum level of N-TP of type I collagen significantly exceeds the normal values in all adolescents with obesity, in contrast to the children of the control group ($p < 0,05$), (Table 2).

Table 2. The levels of N-terminal propeptides and C-terminal telopeptides of type I collagen in adolescents with obesity, ($M \pm \sigma$).

Adolescents with obesity	N-TP, pmol/l	C-TT, ng/ml
MS +	8,32 ± 0,71 * **	1,68 ± 0,18
MS -	6,11 ± 0,65 *	1,61 ± 0,18
Control group	4,33 ± 0,13	1,75 ± 0,3

* Difference between patients with obesity and control group ($p < 0,05$)
** Difference between patients MS + and MS - ($p < 0,05$)

In patients group MS + the level of N-TP of type I collagen were more elevated than in the group MS -, which indicates a more intensive process of liver fibrogenesis in the presence of metabolic disoders. The levels of C-TT of type I collagen in adolescents with obesity were within the norms and did not differ statistically significantly from those in the control group ($p > 0,05$). Apparently, this is due to the predominance of fibrogenesis processes over fibrolysis, which is typical for liver fibrosis.

Conclusion. Thus, non-invasive diagnostic methods using serum biomarkers of liver fibrosis (type IV collagen, fibronectin, N-terminal propeptides and C-terminal telopeptides of type I collagen) have confirmed their diagnostic sensitivity in establishing the progression of fatty liver disease.