



Research Article

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On the Results of Detectability of the Level of C-Terminal Telopeptide of Type I Collagen in Patients with Post Hysterectomy Genital Prolapse in Uzbek Population

Shamirov DA and Mavlyanova NN*

Department of Obstetrics and Gynecology, Ministry of Health of the Republic of Uzbekistan, Uzbekistan

*Corresponding author: Mavlyanova NN, Department of Obstetrics and Gynecology, Practical Medical Centre, Ministry of Health of the Republic of Uzbekistan, Uzbekistan.

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Summary

The article presents an assessment of the levels of the C-terminal type I collagen telopeptide in patients with Post-Hysterectomy Genital Prolapse (PHGP). The results of an EIA study on the detectability of the level of C-terminal telopeptide of type I Collagen (CTX) in patients with PHGP amounted to 67.3% of cases. Among background diseases, patients with PHGP were most often diagnosed with urinary tract infections (47.3%), metabolic syndrome (obesity) (23.6%), and anemia (30.9%), respectively.

Post-Hysterectomy Pelvic Organ Prolapse (PHPOP) is a multifactorial disease with a syndromic course, characterized by a genetic predisposition to the formation and progression of the pelvic floor muscles [1-4]. Genital prolapse, which has an early manifestation, is also characterized by a high recurrence rate after surgical treatment. The clinical manifestations of genital prolapse are urgent incontinence in more than 84.7% of female patients. Also, defecatory disorder, sexual disorders, and dyspareunia have been reported. [3-9]. Collagen metabolism disorders, namely, changes in the extracellular matrix, play an important role in the GP formation and progression. During the remodeling of the components of the extracellular matrix, the processes of synthesis and degradation of collagen filaments are unbalanced, and collagen bonds between individual vascular smooth muscle cells, fibroblasts are lost. In this process, matrix metalloproteinase (MMP) plays a special role in GP pathogenesis [10,11]. Influenced by MMP-1, type I-III collagen molecules are broken down [11].

Keywords: Post hysterectomy genital prolapse, C-terminal telopeptide of type I collagen, Background diseases

The Aim of the study

It is to assess the level of C-terminal telopeptide of type I collagen in patients with genital prolapse after hysterectomy.

Material and Methods of Research

We examined 92 patients aged 35 to 67. Of them, there were 55 women (56.5%) with post-hysterectomy genital prolapse who were included in the main group. The control group consisted of 37 patients of the corresponding age. All women underwent clinical,

instrumental, functional, EIA, molecular-genetic and statistical tests. The content of C-terminal telopeptides formed during the degradation of type 1 collagen was determined by EIA. Statistical studies by analysis of variance using Student's t-test (Excel-2010).

Research Results

The results of an EIA to determine the detectability of the level of C-terminal telopeptide of type I collagen (CTX) in the examined



patients showed that among 55 women of the main group, 37 had in an increase in the level of CTX-1 in the blood, which accounted for 67.3% of cases. Whereas in the control group of women (37 subjects) only 3 women had an increased level of CTX-1, which accounted for 8.1% of cases (Table 1). The results obtained indicate the presence of a high level of CTX-1 in the blood of patients with PHGP. An analysis of the quantitative assessment of the C-terminal telopeptide of type I collagen in the blood of patients with PHGP revealed an increase in the level of CTX-1 in the blood of patients with PHGP by 4.4 times compared with the indicators of the healthy controls and averaged 2.2 ± 0.17 ng/mL and was statistically significant. ($P < 0.05$) (Table 1). As follows from the table, the level of the C-terminal telopeptide of type I collagen in the control group averaged 0.5 ± 0.06 ng/mL. The obtained data were analyzed taking into account the age aspects of the main group of women (Table 2).

Table 1: Evaluation of the level of C-terminal telopeptide of type I collagen in patients with PHGP ($M \pm m$).

Groups	Control Group N=37	Main Group N=55
C-terminal telopeptide, CTX ng/mL	0.5 ± 0.06	$2.2 \pm 0.17^*$

*Note: Significance indicator in relation to the control group of healthy subjects ($P < 0.05$).

Table 2: Evaluation of the level of C-terminal telopeptide of type I collagen in patients with PHGP, taking into account age (ng/mL) ($M \pm m$).

	35-40 N=8	41-45 N=12	46-50 N=14	Over 50 N=22
Main group	$1.8 \pm 0.7^*$	$1.7 \pm 0.3^*$	$1.6 \pm 0.2^*$	$1.7 \pm 0.2^*$
Control group	0.5 ± 0.06			

*Note: Significance indicator in relation to the control group of healthy subjects ($P < 0.05$).

The results of the study of the level of C-terminal telopeptide of type I collagen, considering the age of women, revealed the absence of significant differences in indicators, i.e., in all age categories, the level of CTX-1 in the blood was 3.2-3.6 times compared with the indicators of healthy control, and were statistically significant. ($P < 0.05$). It should be noted that among the examined patients, the maximum level of CTX-1 was observed at the reproductive age of 35 to 40 years. However, the indicator was not statistically significant. ($P > 0.05$). Thus, an increase in the level of C-terminal telopeptide of type I collagen was found in patients with PHGP compared with the control group of healthy women. It is known that in the PHGP development, an important role is attached to the background disease and in this regard, we analyzed the features of their detection in the examined women (Figure 1).

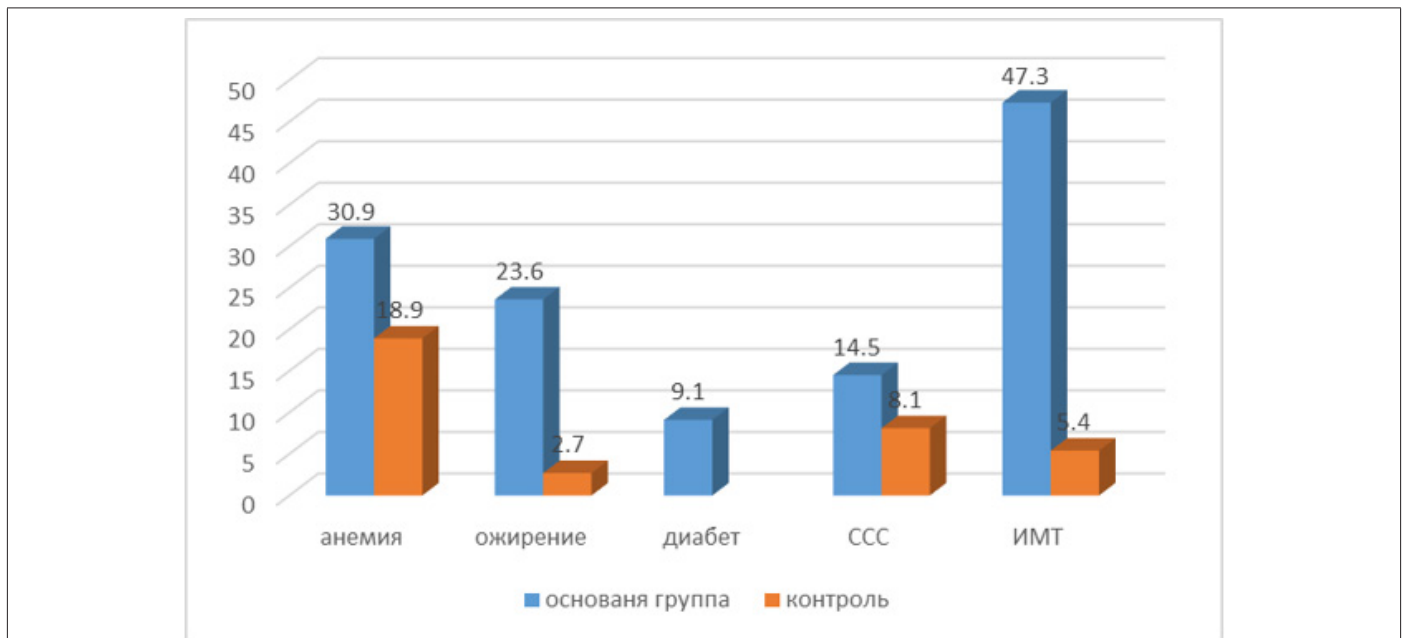


Figure 1: Rate of comorbidity in examined women (%).

As follows from the figure, women with PHGP in the main group were most often diagnosed with urinary tract infections-47.3% (in 26 out of 55), metabolic syndrome (obesity)-23.6% (13), anemia-30.9% (17), cardiovascular diseases-14.5% (8), and diabetes

mellitus-9.1% (5), respectively. Whereas in the control group of healthy subjects, anemia-18.9% (7 of 37), CVD-8.1% (3), BMI-5.4% (2) and obesity-2.7% (1), respectively, were often diagnosed. Thus, the analysis of the obtained results indicates that in women with

PHGP, there is an increase in the level of the C-terminal telopeptide of type I collagen compared with the group of patients without GP signs. The increase in the level of the C-terminal telopeptide of type I collagen in the patients revealed during the study reflects an increase in the processes of disorganization of the intracellular matrix and the breakdown of interstitial collagen, which is one of the biochemical markers of the trigger for the development of PHGP.

Conclusions

- a) Results of an EIA to determine the detectability of the level of C-terminal telopeptide of type I collagen (CTX-1) in patients with PHGP was 67.3% of cases.
- b) Analysis of the quantitative assessment of the C-terminal telopeptide of type I collagen in the blood of GP patients revealed an increase in the level of C-terminal telopeptide of type I collagen in the blood of GP patients by 4.4 times compared with the indicators of the healthy controls and averaged 2.2 ± 0.17 ng/mL and was statistically significant ($P < 0.05$).
- c) Patients with PHGP were most often diagnosed with urinary tract infections-47.3%, metabolic syndrome (obesity)-23.6%, anemia-30.9, respectively, as background diseases.

Acknowledgement

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Conflict of Interest

No conflict of interest.

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