IRON METABOLISM UNDER SELECTIVE INDIVIDULIZED CORRECTION

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ABSTRACT — The aim of the study was to study the effect of individually formed vitamin and mineral complex is containing iron on the metabolism of this trace element. Methods: we examined healthy persons (n=314), is randomizing into 2 groups. The main group (n=116) received a vitamin and mineral complex with the necessary amount of iron (the dose was calculated based on the results of the initial laboratory examination of the patient) during 30 days, and the comparison group (n=198) got a similar complex without iron-containing component. Prior to administration of the complex and immediately upon completion of the full course, the total iron concentration in the blood, serum iron level and ferritin content in the blood were determined. Results: the randomized controlled one-center study confirmed the positive effect of the course of personalized correction of iron metabolism on a number of its biochemical indicators (total iron level in the blood, serum concentration of this trace element and the amount of ferritin).

KEYWORDS — iron, blood level, personalized correction.

INTRODUCTION

Iron deficiency is one of the most common problems of the population of large cities [1, 2, 5]. Numerous epidemiological studies indicate, on the one hand, a sufficiently high frequency of iron deficiency anemia and associated pathological conditions [1–3] and, on the other hand, indicate a significant proportion of persons with subclinical manifestations of metabolic disorders of this trace element [6]. Thus, according to the results of our previous studies, up to 27% of the adult population of the metropolis have either full-fledged or subclinical (at the level of the lower quartile) serum iron deficiency [4]. These facts clearly indicate the feasibility of targeted detection and personalized correction of iron deficiency. In this regard, the aim of the work was to study the effect of individually formed vitamin and mineral complex is containing iron on the metabolism of this trace element.

METHODS

The study was designed as an open prospective, randomized controlled trial. It included 314 people belonging to the category of *practically healthy people*. The inclusion criteria were the age from 20 to 50 years, the absence of acute or chronic in the acute stage of pathology, as well as the presence of subclinical or clinical serum iron deficiency. All participants in the study signed informed consent prior to the initial survey. Further, the examined persons were randomized into 2 groups: the main group (n=116), representatives of which received a vitamin and mineral complex containing the necessary amount of iron (the dose was calculated based on the results of the initial laboratory examination of the patient), and the comparison group (n=198), which received a similar complex, the only difference of which was the absence of an iron-containing component. The duration of reception of the complex was 30 days.

Prior to administration of the complex and immediately upon completion of the full course, the total iron concentration in the blood (in μg/l), serum iron level (in μmol/l) and ferritin content in the blood (in μg/l) were determined. All these parameters were evaluated by standard methods.

The data were processed in the software package Statistica 6.1.

RESULTS

It was found that the majority of the studied parameters in the second control point of observation did not change relative to the first one (Fig. 1–3).

Thus, the total concentration of iron in the blood and its serum level remained at the initial values (Fig. 1 and 2), while the amount of the main iron-transport protein of the blood — ferritin — even showed a downward trend (-2.6%; $p<0.1$).

On the contrary, the personalized correction of the metabolism of the microelement under consideration contributed to the increase of all the studied parameters (Fig. 1–3). In particular, there was an increase in the total concentration of iron in the blood by 13.4% compared with the baseline ($p<0.05$), exceeding the value characteristic of the comparison group by 10.0% ($p<0.05$). A similar dynamics was recorded for serum iron level (an increase of 16.8% relative to baseline values and 8.3% — to the comparison group ($p<0.05$ for both cases))

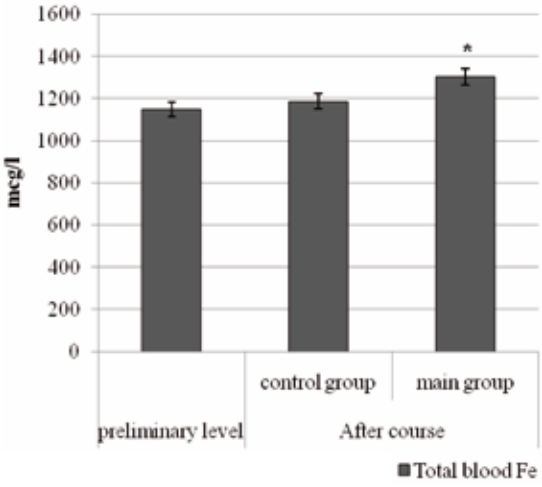

Fig. 1. Total blood level of the iron before and after the administration of vitamin and mineral complex

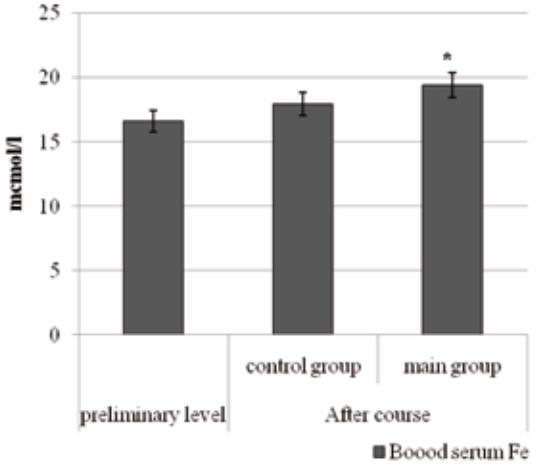

Fig. 2. Blood serum level of the iron before and after the administration of vitamin and mineral complex

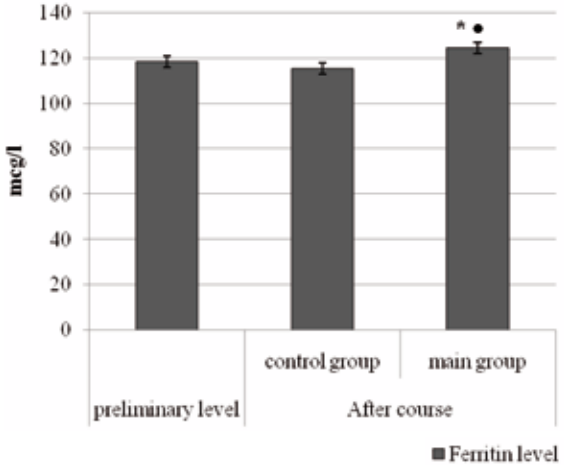

Fig. 3. Blood level of the ferritin before and after the administration of vitamin and mineral complex

The changes in ferritin levels were significant too (Fig. 3). It was found that the concentration of this iron transport protein in the representatives of the main group increased by 5.1% compared to the first control point and by 7.7% - relative to the comparison group ($p<0.05$ for both cases)

CONCLUSION

Thus, the randomized controlled one-center study confirmed the positive effect of the course of personalized correction of iron metabolism on a number of its biochemical indicators (total iron level in the blood, serum concentration of this trace element and the amount of ferritin).

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