SUBJECT: Status of Adolescents with Symptoms of Iron Deficiency in Ukraine

INTRODUCTION

Family doctor (FD) faces a wide variety of pathologies in his everyday practice. Nowadays, in the realities of health care reform, primary care plays the leading and essential role in guiding patients to early diagnosing, treating, preventing diseases. Almost 80% of patients start and end their pre-hospital treatment not being carried to the secondary medical care. According to this fact, it is important to know risk groups of population to each abnormal condition of health. WHO provided a report “Health for the world’s adolescents” fully addressing that question across the broad range of health needs of people ages 10–19 years and found them as a core area for health sector action. [1-3] National Center of Statictic in Ukraine shows, that in 2019 year there are nearly 13 million in rural areas and 29 million in cities of population, where part of people aged 10–19 years amounts 750 thousand in rural areas and 1,5 million in cities. For last 10 years morbidity in Ukraine remains nearly at the same levels. Adolescents usually get medical care in pediatricians or family doctors and the volume of diagnostical tools and services can differ depending from territory of living, region, whether it is governmental or private clinic, and for sure varies depending on knowledge and skills of doctor. Iron deficiency and anemia is one of the most common public health difficulties in the world and in Ukraine as well. [1-4] ID is associated with intensive cognitive function, impaired physical work capacity, physiological changes in hormones and poor pregnancy outcomes. The onset of menstruation in girls, rapid growth with phosphorylal conditions that occur during adolescence, and the consumption of predominantly plant-based diets with low bioavailable iron, as well as product which tend to decrease iron consumption, all contributes to the depletion of iron stores that substantially increases the risk of teenage population to ID. What is more, the compliance to oral iron supplementation keeps quite low positions because of side-effects of medicines, therefore it is important to diagnose ID as early as possible. [3, 5]

THE AIM

The purpose of this research was to study the reasons adolescents are underdiagnosed in iron deficiency in Ukraine.

MATERIALS AND METHODS

We provided a data analysis of medical records on the reasons and frequency of requests for medical assistance...
among teenage children, including the age group 10-19 years in Kyiv during 2018. The group of exclusion criteria included patients with traumatic brain injury, burns, eye diseases, congenital abnormalities of development, child-

hood infirmities, persons who had contact with radiation, oncological patients, patients who had surgery within the last 3 months. Moreover, the researched cases were provided by private medical institutions as we needed to compare the laboratory tests, which are not available in governmental primary care institutions.

In this research were used such key methods as basic data analysis, correlation-analysis and summarizing of gathered results.

The work was performed in accordance with the principles of the Helsinki Declaration of the World Medical Association “Ethical principles of medical research with the participation of a person as a research object” and approved by the Bioethics Commission of Shupik National Medical Academy of Postgraduate Education.

RESULTS
According to the World Health Organization (2007) anemia in adolescents is defined as hemoglobin level <12.0 g/dl in female after 11 y.o and <13.0 g/dl in men in the age-group after 15 y.o. Serum ferritin level <15 µg/L and soluble transferrin receptor (sTfR) level <5.0 mg/L were considered as iron deficiency status.[6-7]

There were 725 cases of the primary application to the doctor for medical aid 390 (53.8%) female and 335 (46.2%) among generally healthy teenagers and with deseases.

![Fig. 1. Distribution among generally healthy teenagers and with deseases.](image1)

![Fig. 2. Causes for appointment to doctor in patients aged 10-19 y.o.](image2)
male 2018. The distribution according to the age was: early adolescent age (10-13 y.o.) group 1 – 338 cases (185 female, 153 male), middle adolescent age (14-17 y.o.) group 2 – 365 cases (189 female, 176 male) and late adolescent age (18-19 y.o.) group 3 – 22 cases (16 female, 6 male). The comparison above shows approximately equal percentages of male and female adolescents in groups 1 and 2. More than fifteen times less than among adolescents of late age. All the reasons of primary appointment to doctors were divided into two categories: mostly healthy individuals who need a medical conclusion for some activities or attending educational institutions or patients who needed a compulsory annual medical examinations because of complaints. We found that the quantity of in general healthy teenagers was among all 21.2%, who mostly were people from group 1 (early adolescent age). The primary morbidity and acute pathology were higher in the 2nd group, but in general in numbered 57.6%. It is notable, that morbidity in the 3rd group was nearly the same as in 2nd one. (Figure 1)

The number of referrals dominated initially to ENT (36.8%), family physicians (25.6%) and pediatricians (23.3%), with a nearly equal distribution of patients by gender. There was a difference of 29.4% with a predominance of male among the consultations with a neurologist, 9% with a predominance of a female with a referral to a gastroenterologist and similarly with 12.4% with a referral to a dermatologist.

From all the cases there were 162 cases (22.3 %) where clinical laboratory blood test was performed (56.8% male,
The analysis of medical records revealed the expediency of the syndromic distribution of causes of treatment, as well as the identification of risk groups and early diagnosis of pathologies among adolescent children in the practice of a family doctor. There is a tendency for the highest number of complaints about diseases of the upper respiratory tract (46.4%), skin and subcutaneous tissue (9%), vegetative somatic disorders (7.2%). A fifth part of adolescent patients appointments was made up of healthy individuals, of whom (69.5%) belonged to the age group of 10–13 years. In the age group of 14–17 years the figure was (28.7%). The majority of appeals among children aged 10–19 were appeals to the ENT doctor (36.8%), family doctor (25.9%), pediatrician (23.3%). The distribution among specialties of doctors, who prescribed a blood test was: 104 (64.2%) family doctors, 15 (9.3%) ENT, 33 (20.4%) pediatricians, 10 (6.1%) other specialists. Serum ferritin was discovered in 22 cases (13.5%). 

CONCLUSION
Inflammatory changes in the blood are not related to the amount of hemoglobin, erythrocytes and erythrocyte characteristics. Hemoglobin, hematocrit and erythrocyte counts are not informative in the diagnosis of iron deficiency. Consequently, patients of the adolescent age need to be yearly referred to the clinical blood test with checking ferritin if there are any risks of iron deficiency. In the case, when there are no MCH and MCV mentioned, it is possible to consider color index as marker of possible iron insufficiency.

REFERENCES
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The Authors declare no conflict of interest.