Comparative Characteristic of Population Mechanisms for Formation of Iron Deficiency States among the Drugging Population

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1. Introduction

As you know, IDS - anemia and latent iron deficiency (SDNS) - are common metabolic disorders [1, 9]. In various studies in recent years, it has been convincingly proven that not only iron deficiency anemia, but also IDS is of clinical significance. IDS causes significant "minor" symptoms from the nervous, cardiovascular and digestive systems, leading to an increased risk of developing hematological and therapeutic continuum [5].

This is of particular importance for the population of drug-addicted population, in which CD and MTOs are characterized by a low-symptom course or a variety of clinical masks.

Therefore, our study carried out a comparative study of the prevalence of iron deficiency states among the drug addicted population of Andijan.

Table 4 shows the average indicators of blood composition and iron metabolism in the population of drug-addicted population aged 15-49.

As can be seen from the following indicators were used to characterize iron metabolism in the drug addict's population: hemoglobin concentration in the blood, hematocrit, average hemoglobin concentration, plasma iron, serum transferrin (serum iron-binding capacity), TSI (transferrin saturation with iron) and ferritin in the blood. The noted indicators, according to the literature, are the most diagnostically significant and informative for the establishment of IDS.

Keywords: iron deficiency animia, epidemiology, risk factors, diagnosis, prevention

2. Materials and Methods

The epidemiological study was carried out on a representative sample of the drug addicted population of Andijan in the amount of 589 people. The surveyed population was dominated by men (98.9%). The population survey was carried out strictly in the following sequence: Registration office → treatment room (blood was taken for biochemical studies) → doctor's room (a group of specialists, consisting of 4 interviewers-doctors, conducted a comprehensive medical examination) → ECG room → ultrasound room. Before a drug addict-patient left the screening center, he received appropriate recommendations for primary, secondary and tertiary prevention of IDS. The following methods were used to diagnose IDS: questionnaires (WHO, 1990), biochemical (determined lipids, glucose, basic trace elements and uric acid in venous blood using generally accepted methods that are widely used in medical practice), instrumental (ECG, ultrasound examination of internal organs, FEGDS- selective measurement and assessment of blood pressure, assessment of the Quetelet index) and general clinical (general analysis of blood, urine and feces, protein spectrum of blood). The diagnosis of IDA (latent iron deficiency-IDA and iron deficiency anemia-IDA) was established on the basis of clinical data, typical sideropenic, trophic disorders, decreased hemoglobin, color index (hypochromic type of anemia), serum iron and ferritin levels.

Statistical processing of the results was carried out on a Pentium III personal computer in Windows operating platforms using a standard Microsoft EXCEL 97 application package. Methods of multivariate statistical analysis were used, intensive indicators and average values of quantitative indicators were calculated. The significance of the differences in the studied indicators was assessed using the Student's test (t).

3. Results and Discussion

As can be seen from table 4, the average total blood hemoglobin in the drug addict's population is 101.4 ± 0.20 g / l. The surveyed men had a significant difference in the total hemoglobin values. So, the average value of this indicator for them is - 104.6 ± 0.17 g / l and 98.2 ± 0.23 g / l, respectively ($P < 0.01$).

This circumstance is of interest because the literature indicates the importance and significance of the index of

total hemoglobin in blood in the assessment of hemoglobin health in the population [4].

Analysis of the data in Table 4 indicates a higher level of hematocrit in men (0.32 ± 0.002 L / L) compared with female drug addicts (0.29 ± 0.001 L / L) / the difference is statistically significant; P <0.05/. The average hematocrit in the general population was 0.31 ± 0.002 L / L.

The average concentration of hemoglobin in erythrocytes in the examined drug addicts averages 23.2 ± 1.02%. For male drug addicts this indicator averages 23.8 ± 1.21%, and for women - 22.6 ± 0.83%. Consequently, this indicator for men and women who are drug addicts does not differ significantly - 23.8 ± 1.21% and 22.6 ± 0.83%, respectively (P> 0.05).

The average serum iron content in the general population of drug addicts is 13.0 ± 0.89 μmol / l. In the surveyed men, this indicator averages 13.5 ± 1.0 μmol / l, in women - 12.5 ± 0.78 μmorl / l. Thus, the serum iron index, on average, also does not differ statistically significantly - 13.5 ± 1.0 μmol / L and 12.5 ± 0.78 μmol / L, respectively (P> 0.05) in the examined male and female drug addicts.

As you know, serum transferrin is an important criterion in the diagnosis of diseases associated with metabolic disorders in the body, and, first of all, in the diagnosis of IDS. Based on this, it was of interest to consider this indicator in the population of drug addicted population.

The total serum transferrin index in the population of drug addicts averages 2.27 ± 0.002 g / l, relatively high levels of this indicator are found in women (2.29 ± 0.001 g / l) compared with male drug users (2.24 ± 0.002 g / l). It can be seen that this indicator, on average, also does not differ

statistically significantly - 2.29 ± 0.001 g / l and 2.24 ± 0.002 g / l, respectively (P> 0.05).

A comparative study of the indicators of the transferrin saturation coefficient with iron showed that the CST in the surveyed drug addicts averaged 19.5 ± 0.61%, and there are also no significant differences in male and female drug addicts - 20.8 ± 0.72% and 18.1 ± 0.50%, respectively (P> 0.05).

Literature data also indicate that ferritin is a highly informative marker characterizing iron metabolism. Determination of its concentration in blood serum makes it possible to effectively differentiate iron deficiency states [4, 7].

In our study, this indicator in the general population of drug addicts is 35.0 ± 0.12 ng / ml, higher levels of this indicator are found in men (39.6 ± 0.15 ng / ml) compared to women (30.3 ± 0.10 ng / ml) / the difference is statistically significant; P <0.001 /. Apparently, such a significant difference in ferritin indices in the surveyed can be explained with dietary habits and RF accumulation: epidemiological conditions and the accumulation of risk factors for IDS, according to the literature, are significantly better in men than in women [8, 10].

In general, as can be seen from our data, the plasma indicators of iron metabolism in the drug-addicted population of men and women did not differ significantly. They differ with a significantly lower severity in levels compared to those in the population of non-narcotic conventionally healthy population.

We have carried out a study of the hemoglobin indices detectability in the population of 15-49-year-old drug addicts. Regarding data are presented below in Figure 1.
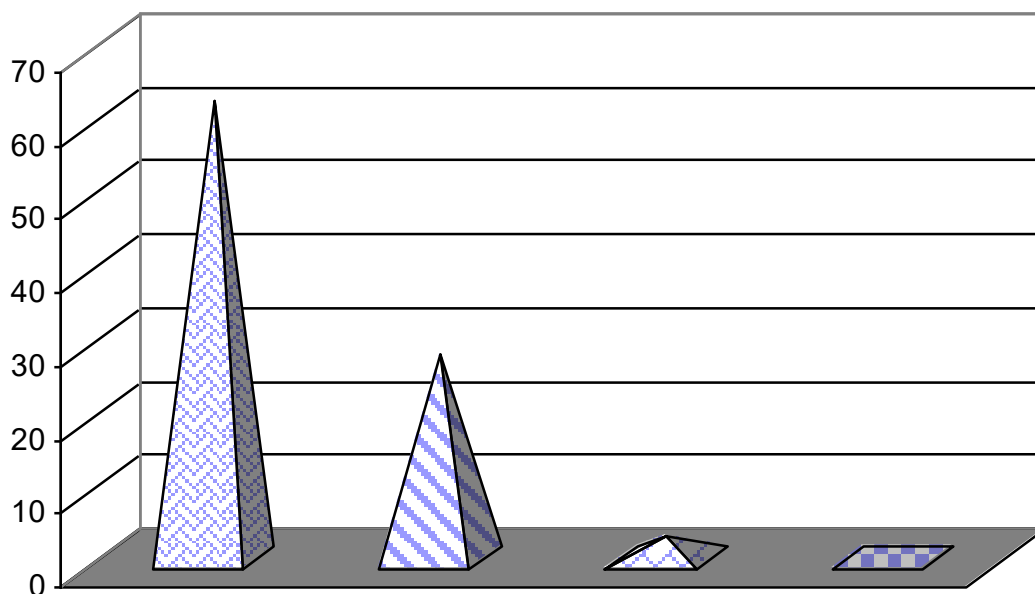

Figure 1: Detection of hemoglobin parameters in the population of drug addicted population aged 15-49 years

	n=282	n=113	n=13	n=0
Hg 100-119,0 г/л	69,2			
Hg 120-129,3 г/л		27,7		
Hg 130-140,0 г/л			3,1	
Hg 141-170 г/л				0,0

As can be seen from Figure 1, in the range of hemoglobin indices of 100.0-119.0 g / l, the largest number of certain values of the hemoglobin indicator of blood is detected in the examined drug addicts - 282 examined or 69.2% of all cases. Above the level of 119.0 g / l, hemoglobin indices were detected in 113 drug addicts, or in 27.7% of cases, and above 190.0 g / l, the hemoglobin indicator was determined only in 3 surveyed drug addicts aged 15-49, or in 3, 1% of all cases.

In the course of analyzing the results of the study, we also studied the distribution of serum iron indices in the population of drug addicts. Figure 2 shows the frequency of detection of serum iron in the examined drug addicts aged 15-49 years.
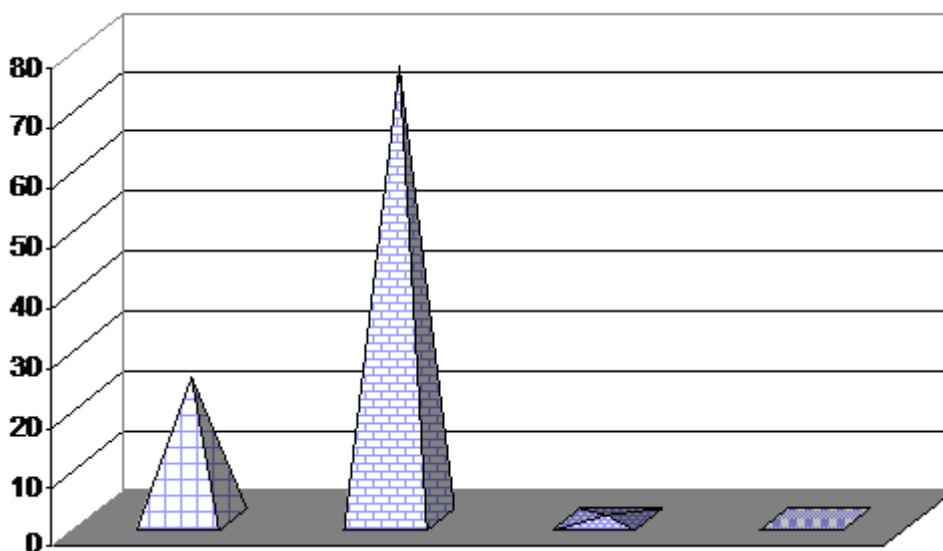

Figure 2: Detection rate of serum iron in the population of drug-addicted population aged 15-49 years

	n=97	n=308	n=3	
Fe++ 6,4-7,5 мкмоль/л	23,8			
Fe++ 7,6-10,4 мкмоль/л		75,5		
Fe++ 10,5-18,8 мкмоль/л			0,7	
Fe++ 18,9-28,3 мкмоль/л				0,0

As follows from the illustrative materials in Figure 2, the largest number of determined values of the serum hemoglobin index in the drug addicts population is found in the range of serum iron values 7.6-10.4 μmol / l - 97 examined (in 23.8% of all cases) and 10.5 -18.8 μmol / L - 308 examined or in 75.5% of all cases. Above the level of 18.8 μmol / l, serum iron values were determined only in 3 surveyed populations - drug addicts aged 15-49 years, or in 0.7% of cases.

Table 1 shows the prevalence rates of IDS among the surveyed population of drug addicted population aged 15-49 years

Group of surveyed	Number of surveyed SJ	SID (1)		IDA (2)		IDS		Statistics differences in t-criterion (P)		
		n	%	n	%	N	%	P<0,05	P<0,01	P<0,001
Women - drug addicts 15-49 years	6	-	-	6	100,0^X	6	100,0^X	-	-	-
Male drug addicts 15-49 years	583	86	14,8	402	69,0	488	83,7	-	-	2-1
Total population of drug addicts aged 15-49	589	86	14,6	408	69,5	494	83,9	-	-	2-1

Appendix 1

Comparative frequency of the prevalence of iron deficiency states in the population of drug addicted population aged 15-49 years.

It should be mentioned that we considered a combination of hemoglobin levels of at least 120 g / l in women and 130 g / l in men with a decrease in iron concentration to less than 12.5 μmol / l (in women) and 10.5 g / l as biochemical signs of latent iron deficiency. μmol / L (in men) and an increase in plasma TIBC to a level of more than 64.4 μmol / L. The diagnosis of iron deficiency anemia was based on the same values of iron metabolism, subject to a decrease in hemoglobin levels.

As can be seen from Table 5, the prevalence of IDS in the surveyed population of drug addicts aged 15-49 is 83.9%. IDA is observed with a frequency of 69.5%, and IDA is detected at a level of no more than 14.6%, that is, 69.3% or 4.8 times less than the frequency of IDA (P <0.001).

In the surveyed women, IDS was detected in 100% of cases. In the group of men surveyed, the frequency of iron deficiency states is 83.7%, of which 14.8% were latent iron deficiency and 69.5% were iron deficiency anemias (P <0.001).

In general, according to our data, the prevalence of iron deficiency states - IDA and latent iron deficiency - in the drug addicted population is more pronounced than in adolescents [70, 138] and adults without drug addiction [1, 3].

Further, we carried out a comparative study of the frequency of detection of SID and IDA in the structure of iron deficiency states in general among the examined drug addicts.

Data in this regard are presented in Figures 3 and 4.

As can be seen from Figure 3, 81.6% of cases of iron deficiency in the general population of drug addicts are attributed to iron deficiency anemia, only in 18.4% of cases they are due to latent iron deficiency (P <0.001).

Figure 4 shows the structure of iron deficiency states in the male drug addict population.
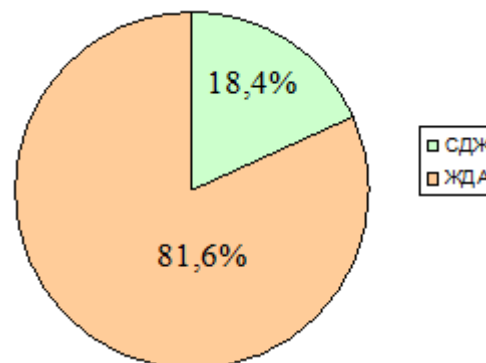

Figure 3: The structure of iron deficiency conditions in the general population of drug addicts
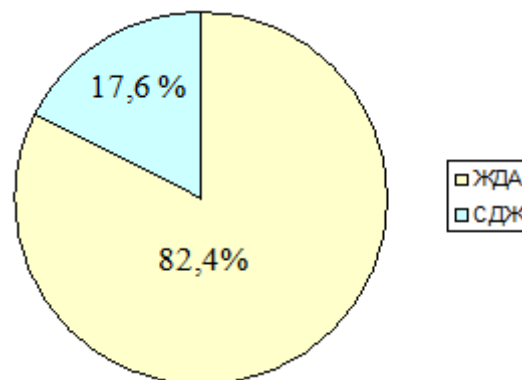

Figure 4: The structure of iron deficiency conditions among male drug addicts population

As can be seen from Figure 4, the study of the structure of iron deficiency conditions according to the screening of drug-addicted male population showed that the main contribution is made by iron deficiency anemias, whose share was 82.4%. The specific weight of SID in the structure of the IDS is 11.6% (P <0.001). Let us mention that due to the small number of female drug addicts (only 6), we did not conduct an analysis of this nature, or in women in 100.0% of cases the anemia had an iron deficiency character.

4. Conclusions

1. Iron-deficiency conditions are widespread among the drug addicted population (83.9%). Iron deficiency anemia and latent iron deficiency were detected, respectively, in 69.5% and 14.6% of the surveyed and in 69.0 and 14.8% of male drug addicts aged 15 to 49 years.
2. Epidemiological screening of drug addicted populations should be carried out using complex (questionnaire, clinical, instrumental, biochemical) epidemiological methods for identifying IDS and risk factors for their development.

3. Screening technologies and prevention programs should be based on data on population patterns of IDS formation, which contribute to the early detection of their "epidemiological mechanisms" and open up new perspectives in the field of prenosological diagnosis and prevention of IDS among drug addicted populations.

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