

# Blood System Research in Women's Organism as a Bioindicator of the Ecological State of the South Aral Sea Region

Serimbetova Rufiya Sarybaevna

Assistant of the Department of General Biology and Physiology, Karakalpak State University, Nukus, Karakalpakstan, Uzbekistan

**Abstract:** *The article presents the results of a study of indicators of the blood system in the body of women as a bio-indicator of the ecological state of the South Aral region. A progressive process has been found to gradually reduce red blood cell saturation with hemoglobin. The trend is the same for all areas of the Aral region, only with varying degrees of severity.*

**Keywords:** Aral region, blood system, bio-indicator, environmental factors, environment.

## 1. Introduction

Severe environmental pollution poses a great danger to public health. A significant share in the incidence of women and children belongs to environmental pathology. According to many experts, anemic syndrome and changes in the blood system can serve as a biological marker of technogenic environmental pollution [5, 6]. The study of this problem for the South Aral Sea region is especially important, since this region is one of the territories with an unfavorable environmental situation.

Current negative trends in the state of the environment and changes in the health indicators of the population today have acquired special significance for the Republic of Karakalpakstan.

At present, it can be considered proven that anthropogenic environmental pollution has a pronounced effect on the formation of population health, especially in connection with changes in socio-economic conditions [1]. In this regard, the development of a safety concept in the field of ecology and hygiene, aimed at eliminating the obvious and potential risks to human health associated with exposure to adverse environmental risk factors, is becoming particularly relevant.

Currently, an increase in blood diseases, including anemia, is noted in the region [3, 4, 6]. Studies regarding the characteristics of the blood system indicators among the population living in poor conditions of the Republic of Karakalpakstan require fresh information, in connection with this, the main goal of this work was to characterize one of the indicators of the blood system, namely the content of red blood cells in women living in different regions of Karakalpakstan.

A general clinical blood test, being one of the most important diagnostic methods, reflects the reaction of the hematopoietic organs to the exposure of various physiological and pathological factors to the body. In many cases, it plays a large role in the diagnosis, and in diseases of the hematopoietic system, he plays the leading role.

## 2. Material and Research Methods

The object of the study was female people aged 20 to 60 years living in the southern Aral Sea region. Surveys were conducted in the Northern, Southern and Central regions of the Republic of Karakalpakstan. Northern areas include Takhtakupyrysky, Kungradsky districts. Southern areas include Amu Darya, Beruni and Turtkul regions. The Central districts include Nukus, Khojeyli and Kegeyli districts. A total of 350 women were examined.

## 3. Results and its Discussion

The analysis found that for women living in the northern regions of the South Aral Sea region, the hemoglobin (Hb) in the blood in 1980 at the age of 20-50 years was 11.0-12.0 mg /%, by the age of 60 - 10.5 mg /%. These values are below the control by 9-11%. The difference increases with age. In older women, it is only 6%, since they have a lower physiological norm of hemoglobin (Hb). In 1990, there were changes in the hemoglobin content in the blood of the examined women. In relation to the norm, it decreased in all age groups: 20-30 years old by 12%, 40 years old - 11%, 50 years old - 15% and 60 years old - 11%. If we compare the Hb content of this year with the indicators of 1980, we can see that there is a tendency to its decrease (2-4%).

Indicators in 2000 indicate deterioration in the saturation of red blood cells with hemoglobin. This applies to all age groups and makes up 18% for 20 year olds, 17% for 30 years old, 20% for 40 years old, 23% for 50 years old, and 13% for 60 years old. Compared with 1980 and 1990, there was a decrease in Hb content by 8, 10, 9, 13, and 8%, respectively, by age.

Summarizing the foregoing, we can draw the following conclusion. In women of the northern regions of the Aral region, the blood Hb content is lower than the control values and this applies to all age groups.

The difference with control concentrations increases with age and becomes especially noticeable at 40 and 50 years. The decrease in hemoglobin in the blood progresses over the years. The clinical significance of this indicator and the

decrease in the concentration of Hb in the blood are known to be the main laboratory symptom of anemia, i.e. we can state the fact of the presence of anemia in women in this region.

A survey in 2000-2019 showed an increasingly progressive decrease in hemoglobin concentration in the blood of women from the southern regions. Its deficit was 15% among 20 year olds, 14% at 30 years old, 19% at 40 years old, 19% at 50 years old, and 10% at 60 years old. Compared to 1980, the concentration of Hb decreased by 5-10%. It is impossible to distinguish any specific age when these changes would be significant. Hb concentration is at a deficit level, starting from adolescence. Given the clinical significance of this indicator, there is reason to state the fact of the development of anemia in women living in the southern regions of Karakalpakstan.

Next was a study of hemoglobin in the blood of women of various ages living in the Central regions of Karakalpakstan. The information obtained is given in table. 3. Normally, the hemoglobin content gradually decreases slightly with age, this is most noticeable by the age of 60 (by 9% compared to 20-year-olds). In 1980, the hemoglobin content in women, regardless of age, was slightly lower than the control values (6-12%), amounting to 11.0-12.0%. With age, there is a slight decrease in the content of Hb in the blood by 6-18%. By the age of 60, it decreases slightly (5%) and is below the control by 9%. If we compare the indicators of 1990 with 1980, we can note a tendency to a decrease in one degree or another of the hemoglobin content in all age groups of the women examined (from 4 to 9%).

Based on the foregoing, it can be concluded that, compared with control values of blood Hb in women living in the Central regions of the Aral Sea region, lower Hb content in all age groups is noted. The difference with the control is more noticeable by the age of 50 and is exacerbated by the age of 60, which can be caused by age-related physiological changes in the aging organism against the background of the general nature of the change. Over the 10 years since 1980, there has been a general tendency toward a decrease in the Hb content in the blood and a certain age-related dependence appears, since its decrease is already more evident in 30 year olds (10%) and further more pronounced (12%). Reduced blood Hb concentration in women from the Central regions of the study region is a laboratory symptom of their anemia.

Summarizing the survey data for women of different ages living in the South Aral Sea region, the following distribution can be obtained by quantitative indicators of hemoglobin in the blood. In 1980, the general condition emerged in all areas of its somewhat lower blood content (by 10-12%).

Survey Results 2010-2019 allow us to state the progressive process of a gradual decrease in the saturation of red blood cells with hemoglobin. The trend is the same for all areas of the Aral region, only with varying degrees of severity. So, if the deviation from the norm in the Southern regions is 14-19%, then in the Central 16-21% and in the Northern 17-23%. The pace of change compared with 1980 is higher in

the last two areas. In all areas, there is some "rejuvenation" of the process of hypogemoglobinosis, which manifests itself at a fairly young age (30 years).

The difference with the control values of the hemoglobin concentration is more noticeable in most cases by the age of 50 and it worsens by the age of 60. The reasons for this may be age-related physiological changes in the body and, in addition to this, objective circumstances that determine the general trend characteristic of all women in this region - a decrease in the concentration of hemoglobin in the blood. If we take into account the well-known clinical value of such an indicator as the concentration of hemoglobin in the blood, then we can assume that their reduced value in the blood in women is a laboratory manifestation of a symptom of anemia.

## References

- [1] Абдиров Ч.А., Агаджанян Н.А., Северин А.Е. Экология и здоровье человека.- Нукус.- Каракалпакстан, 1993.- с. 43-45.
- [2] Атанязова О.А., Ещанов Т.Б., Константинова Л.Г., Курбанов А.Б. Аральский кризис и медико-социальные проблемы в Каракалпакстане - Ташкент: ФАН, 2001. – 116 с.
- [3] Бугланов А.А., Салпина Е.В., Тураев А.Т. Биохимическая и клиническая роль железа // Педиатрия. 1991. № 6. 9-10 с.
- [4] Горожанин Л.С. Возрастные особенности гуморальной регуляции эритропоэза // Успехи физиол. наук.- 1979.- № 1. – 124-135 с.
- [5] Козинец Г. И., Каломова Д. Р., Погорелов В.М. Клетки периферической крови и экологические факторы внешней среды// Клинико-лабораторная диагностика. 1993. № 1. -14-15 с.
- [6] Козинец Г. И. Экология и кроветворение//Гематология и трансфузиология. 1990. № 12 -8-10 с.