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**HEMODYNAMIC MODELS OF PATHOLOGICAL
AND SANOGENIC REORGANIZATION OF THE BODY
IN SYSTEMIC SCLERODERMA DUE TO THE PERSONALIZED
ANGIOCORRECTION OF CAPILLARY HEMATOMAS
AND GIANT CAPILLARIES**

**ГЕМОДИНАМІЧНІ МОДЕЛІ ПАТОЛОГІЧНОЇ
ТА САНОГЕННОЇ ПЕРЕБУДОВИ ОРГАНІЗМУ
ПРИ СИСТЕМНІЙ СКЛЕРОДЕРМІЇ В РЕЗУЛЬТАТІ
ІНДИВІДУАЛЬНО ОРІЄНТОВАНОЇ
АНГІОКОРЕКЦІЇ КАПІЛЯРНИХ ГЕМАТОМ
ТА ГІГАНТСЬКИХ КАПІЛЯРІВ**

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Background. Practical medicine considers rheumatological diseases as infectious, autoimmune and traditionally apply anti-inflammatory treatment, which is complex and, unfortunately, practically does not reach the stage of cure and recovery. Therefore, the diseases of the rheumatological spectrum remain totally unstudied and require further research to establish all pathogenetic factors.

On the other hand, rheumovascularities is increasingly common in medical practice. Rheumatological diseases have vascular changes and disorders and especially require in-depth research and the search for effective ways of overcoming pathological hemodynamic patterns, expanding and detailing of hemodynamic pathological patterns in the diagnostic protocol of the vascular arteriovenous status of the regional limbic reservoir of the upper and lower extremities in vivo, as an ultrasound method on macroangiological, as well as by the method of optical capillaroscopy at the microangiological level.

For the last decade, we have revealed specific patterns of changes in the capillary shape in the nail bed in patients of the rheumatological spectrum, which are highly informative, highly differentiated in systemic scleroderma and lupus erythematosus and today in fact belong to nosologically specific patterns.

The peculiarity of pathological forms of capillaries of the rheumatological spectrum lies in the critical state of blood flow and the urgent need for the personalized Angiocorrection.

The microcirculation condition in patients significantly worsened during the Covid-19 pandemic and was complicated by expressed signs of microthromboangiopathy, often of an occlusive nature with a perfusion block in the entire field of capillaries of the microcirculatory channel.

Such pathological changes has become the object of our research with the aim of finding hemodynamically based angiocorrective algorithms for restoring an adequate level of blood supply to the hands and feet of patients, vascularization of the skin, which significantly worsened after suffering Covid or vaccination against Covid, which led to the search for adequate angiocorrective effects on sanogenic restoration of the existing critical picture of microcirculation and lack of perfusion.

Objectives. For 2020–2024, the combined angiography has been carried out using the methods of ultrasound angioscanning and dopplerography with the assessment of the vascular status of the main and peripheral arteries and veins in the regional limbic reservoir of the upper and lower extremities, smart optical wide-format capillaroscopy with vascular screening technology [1] for the objectification of vascular pathology in microcirculatory channel.

Angiocorrection of arteriovenous and arteriovenular balance at the macro- and microangiological levels has been performed with the aim of restoring blood flow in the hands and feet of 324 patients with Raynaud's syndrome, 34 patients with systemic scleroderma, and 15 patients with systemic lupus erythematosus. To compare physiological and pathological hemodynamic patterns, a group of practically healthy patients consisting of 2,300 patients with microcirculation disorders (a group of psychoneurological patients of non-rheumatological origin) and 1,205 patients with a clinical picture of Raynaud's syndrome.

We have monitored hemodynamic changes daily before and after hemodynamic correction.

Methods. The vascular status of the regional limbic reservoir of the upper and lower extremities has been studied at the macro-, peripheral, and micro levels.

The microvascular channel has been studied by means of large-format smart optical capillaroscopy with analytical vascular screening technology with visualization of capillaries not only of the surface, but also necessarily of the deep layers of the microcirculatory channel of the nail bed of the fingers and toes.

The main vessels and the state of blood flow have been investigated in the entire regional reservoir of the upper and lower extremities by means of ultrasound scanning and graphic dopplerography with the assessment of pathological hemodynamic patterns of angiometers of arteries and veins.

About 80 hemodynamically significant parameters of macro- and microcirculation are used for mathematical modelling according to the results of the primary analysis of data processing of vascular screening technology and angiometers.

The main criteria for mathematical modelling are the caliber and length of capillaries, the presence of arteriovenular shunts, hemodynamic patterns of arteriospasm, adequacy of blood filling of all capillary segments and blood flow, pulse wave, sludge phenomenon, microthromboangiopathy, pathological neoangiogenesis, venular stasis and transformation of venular segments, perivascular edema, various patterns of deviation from the ideal capillary shape in the form of a classic hairpin.

Angiocorrection of the vascular status of the examined patients has been carried out daily by intravenous injection of individually selected combined medical mixtures of vascular drugs aimed at correcting certain hemodynamic disorders [2, 3, 4].

Results. Angiocorrection has demonstrated an effective influence on pathologically altered capillaries by correcting hydrohemodynamic balance and arteriovenular balance. In 83% of the examined patients of the rheumatological spectrum, perfusion in the deep layers of the microcirculatory channel are absent, a pulse wave is absent in 79% of capillaries, which indicates an expressed deficiency of blood filling and blood flow in the microcirculatory channel, which in 97% of cases correlates with marbling of the skin of the hands and/ or the back of the feet, which increased with increasing deficiency to paleness or cyanosis of the skin. Such skin color changes in Raynaud's syndrome have different hemodynamic patterns and required different personalized approaches to the sanogenic transformation of hemodynamic patterns with the dominance of primary venular or arteriolar pathology.

For the one-month course of intensive angiocorrection, the perfusion level of the microcirculatory bed has increased by 10–25%, depending on the severity of the pathological angio-syndrome complex.

The adequate mathematical model of hemodynamic parameters is the basis for the mathematical modelling of hemodynamic changes and the formation of a personalized course of angiotherapy and angiocorrection based on the author's technologies of Acad. Lushchik U.B.

An analysis of hemodynamic changes in the macro- and microangiological direction has been carried out in all examined patients.

The duration of angiocorrection ranged from 2 to 10 months, which indicates the complexity of hemodynamic reconstructions to achieve a targeted result.

The patterns of lupus erythematosus and uncontrolled neoangiogenesis are the most difficult for angiocorrection. The patterns of giant capillaries in the process of angiocorrection have gradually returned to adequate sizes, but it is still not possible to eliminate the patterns of giant capillaries totally. The study of mathematical models of giant capillaries is running.

Conclusions. Thus, angiocorrection and mathematical modelling of hemodynamic patterns in a specific patient is extremely important in the treatment of complex hemodynamically marked microvascular pathologies of the rheumatological spectrum.

Mathematical modelling of the identified pathological hemodynamic patterns, which are specific for Raynaud's syndrome, systemic scleroderma, systemic lupus erythematosus, and oncocapillaries, requires further research and the search for triggering hemodynamic factors.

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**STUDY OF THE PECULIARITIES OF THE EVOLUTION
OF NURSING ON THE TERRITORY OF UKRAINE THROUGH
THE PRISM OF HISTORICAL AND GEOGRAPHICAL
DEVELOPMENT**

**ДОСЛІДЖЕННЯ ОСОБЛИВОСТЕЙ ЕВОЛЮЦІЇ
МЕДСЕСТРИНСЬКОЇ СПРАВИ НА ТЕРЕНАХ УКРАЇНИ
ЧЕРЕЗ ПРИЗМУ ІСТОРИКО-ГЕОГРАФІЧНОГО РОЗВИТКУ**

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З розвитком останніх подій в Україні (COVID-19, російська агресія) стало очевидним, що медсестринство є однією з основних ланок формування та забезпечення національної безпеки населення. Проте, постійні зміни умов функціонування системи охорони здоров'я (медицини, фармації) та суспільства в цілому, призвели до накопичення та загострення асоційованих з фахівцями сектору охорони здоров'я проблем (еміграція; недосконалий розподіл та дефіцит персоналу за регіонами країни, особливо в зоні бойових дій; повільний розвиток медичних шкіл та наукових осередків медсестринської справи; виклики та специфіка медичної інфраструктури в містах та сільських районах України та ін.).

Ускладнюється вищеозначене й впливом регіональних та етнокультурних відмінностей на перехід від класичних методів медичного обслуговування та догляду до сучасних європейських стандартів у медсестринську практику. Розуміння минулого фахівцями та дослідниками є наріжним каменем процесу удосконалення професії до реалій сьогодення.