



MODERN APPROACHES IN THE DIAGNOSIS OF ACUTE KIDNEY INJURY IN OBSTETRIC PATHOLOGIES IN THE ARAL SEA REGION (REVIEW)

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<https://doi.org/10.5281/zenodo.14625743>

ARTICLE INFO

Qabul qilindi: 01-Yanvar 2025 yil

Ma'qullandi: 06-Yanvar 2025 yil

Nashr qilindi: 10-Yanvar 2025 yil

KEYWORDS

equity contribution,
gynecological diseases,
physiological norms

ABSTRACT

One of the largest global environmental disasters in recent history experienced by countries and about 75 million people in Central Asia is the tragedy of the Aral Sea, which, by its ecological, economic and humanitarian consequences, poses a direct threat to the sustainable development of the region, the health of the gene pool and the future of the people living in it.

Not all aspects of acute renal failure (ARF) have been adequately addressed in the numerous studies on acute renal failure (ARF). This is especially true for acute renal failure of obstetric etiology, which is undeservedly neglected, because in most countries with high birth rates, acute renal failure caused by pathology of pregnancy and childbirth occurs in 50-70% of cases in the structure of all etiologic factors leading to this complication. Few works of domestic authors have clearly shown the high frequency of development (50 - 70%) of OPN of obstetric etiology, the severity of its clinical course and stability of high mortality rates in the range (30 - 40%). Numerous features of the development, course and outcomes of OPN caused by pregnancy pathology in different regions of the Republic of Uzbekistan, many unresolved issues, which directly or indirectly causes such disappointing results are shown [16; p. 18].

OPN in obstetric practice is often polyetiologic. As a rule, several etiologic factors act simultaneously (labor, preeclampsia, blood loss, obstetric interventions, various initial concomitant pathologies, etc.). Clarification of certain aspects of the complex mechanism of renal damage and associated clinical manifestations of acute uremia in pregnant women and women in labor is important for improving methods of prevention, treatment of OPN, preservation of maternal and fetal life, as well as the development of methods of rehabilitation of this contingent of patients. Interesting and important in the study is the fact that according to static data of nephrology departments of RUz, the incidence of acute cortical necrosis (ACN) ranges from 22 to 28%.

The pathogenesis of obstetric OPN is one of the most complex aspects of the problem, according to many authors. This complexity is determined by the fact that the pathogenesis of OPN, which occurred during pregnancy, labor and delivery and in the postpartum period, is closely intertwined with the pathological features of pathological pregnancy, preeclampsia, bleeding and septic complications. According to the majority of world scientists, the main

cause of OPN development in obstetrics is vasomotor disorders leading to impaired renal hemodynamics, cortical ischemia, hypoxia and anoxia [19; p. 57].

Renal ischemia in acute kidney injury (AKI) is more often caused by the syndrome of "low cardiac output" with centralization of hemodynamics and regional vasoconstriction with the participation of extra- and interrenal factors, there is also evidence of redistribution of renal blood flow between the cortical and cerebral parenchyma in favor of the latter and the development of edema of the organ enclosed in the capsule. The most pronounced necrotic changes occur in the tubule apparatus of the kidney, very sensitive to oxygen deprivation. Along with ischemia OPN contributes to endogenous intoxication. Microbial toxins, as well as tissue decay products can trigger the production of proinflammatory cytokines, which can subsequently have a detrimental effect on heart function, vascular status, hemostasis system, hemorheology, intrarenal circulation [116, p.240].

Acute kidney injury is a complex disease that does not currently have a clearly defined and peer-recognized definition by most [115, p.15].

The course of OPN is significantly complicated if it occurs against the background of preeclampsia or chronic kidney disease. The main causes contributing to the onset of ARF are the severity of preeclampsia and the duration of its course with microcirculatory disorders and acute vascular insufficiency, which occurred against the background of pronounced vascular disorders characteristic of this pathology of pregnancy. Endothelial dysfunction is characterized by impaired microcirculation with paralytic state of vascular walls, formation of stasis and blood clots leading to organ dysfunction. Blood loss in childbirth or vasomotor collapse causes acute vascular insufficiency. Especially HELLP -syndrome as the final stage of pre-eclampsia can cause the development of intravascular hemolysis. Hemoglobin and its breakdown products, by toxic effect on renal parenchyma, aggravate microcirculatory disorders and renal hypoxia. Many authors, attributing importance to renal ischemia in the pathogenesis of ARF, believe that changes in the hemostasis system play a major role, which leads to the formation of microthrombi, exacerbating the phenomena of renal hypoxia [114, p.35].

In recent years, in connection with the development of immunology and immunopathology in the domestic and foreign literature accumulated data on the immunological relationship between the maternal body and the fetus. The role of autoantigens and autoantibodies in the pathogenesis of the development of preeclampsia and its complications as OPN and this complication of gestation should be considered from an immunological point of view as an autoimmune disease [19, p.57]

According to the latest statistical data of the Ministry of Health of the Republic of Uzbekistan, anemia among pregnant women of varying degrees of severity varies from 70 to 85%, since, according to WHO recommendations (1970), the hemoglobin level in pregnant women below 110-114 g/L should be considered as anemia.

Anemia itself is one of the risk factors for the development of bleeding during pregnancy, childbirth and early postpartum period and has a direct correlation with the weakness of labor forces and the amount of blood loss from the degree of its severity. The frequency of the disease and some peculiarities of the course of anemia in the southern Priaralie zones in Uzbekistan allow us to consider it a marginal pathology. Pregnancy proceeding on the background of anemia in 20 - 40% is complicated by pre-eclampsia and its severity correlates

with the severity of anemia. Accordingly, these severe conditions of pregnancy lead to anemia, disorders of homeostasis of the organism and manifest organ dysfunctions, including OPN[17, p.337].

Based on the above, it should be assumed that the study of the role of anemia during pregnancy in the genesis of OPN may be of fundamental importance in terms of both preventive and therapeutic measures, especially rehabilitation, aimed at restoring renal function and improving the lifestyle of women who have undergone OPN.

The mechanism of OPN development in sepsis is of interest. It was believed that the development of RPN in sepsis is associated with a decrease in renal blood flow and the development of renal ischemia [100, p. 88;]. However, a number of studies have refuted this version. Brenner (2016) studied renal blood flow in sepsis in 8 patients using a percutaneously placed percutaneous thermodilution catheter and showed that renal blood flow did not change, but the glomerular filtration rate (CBF) decreased. The experiment was performed on a sheep that was injected with E.coli, thereby inducing bacteremia and the development of severe sepsis, renal blood flow was measured by laser flowmetry. When interpreting the obtained results, it was found that renal blood flow in both layers remained unchanged, and the introduction of vasopressors contributed to an increase in renal blood flow parameters, indicating the absence of renal ischemia in sepsis, except in cases of marked systemic hypotension in catecholamine-resistant septic shock. This mechanism of RPE development in sepsis is explained by the impaired regulation of the tone of afferent and efferent arterioles by proinflammatory cytokines, which leads to a decrease in filtration pressure in nephrons.

Prerenal and renal forms of ARF are always observed in obstetric terminal conditions. The main mechanism of OPN development is temporary renal ischemia, mainly of the cortex, caused by hypovolemia, spasm of afferent arterioles, disseminated intravascular coagulation with microthrombosis or direct damage to renal vessels. The consequence of this is a marked decrease in filtration pressure and glomerular filtration, shutting down the activity of a certain number of nephrons. If this process is short, OPN is a reversible condition (functional phase of OPN). Prolonged ischemia causes irreversible structural changes in the tubules and tubules, which corresponds to the structural phase of ARF [89, p.315].

In the action of nephrotoxic factors along with the violation of cortical blood flow, the direct damage to the structures of the tubules and tubules is important. Increased pressure in the capsule Shumlyansky-Bowman or in the interstitium leads to a drop in effective filtration pressure. There is a possibility of secondary decrease in the rate of glomerular filtration by the mechanism of glomerular and tubule feedback, which clinically manifests itself as oligoanuria. The most characteristic and pronounced violations are observed in this stage of OPN. Along with a sharp decrease in diuresis up to its complete cessation are observed hyperazotemia, violation of water and electrolyte homeostasis and acid-base equilibrium. The majority of patients suffering from OPN, die at the height of this stage[85, p. 146;].

The pathogenesis of ARF is difficult to explain, it is a multicomponent of interrelated hemodynamic, vascular and tubulointerstitial changes. Increased endothelin production and decreased nitric oxide production in capillary smooth muscle cells leads to increased vasoconstriction and decreased perfusion, which creates conditions for renal parenchyma damage and impairment of its basic functions.

Acute kidney injury (AKI) is a syndrome of progressive acute kidney injury from minimal changes in renal function to complete loss of renal function. This definition was proposed by the Acute Dialysis Quality Improvement Working Group (Acute Dialysis Quality Initiative - ADGI). Acute kidney injury has had various definitions over the last two centuries. Despite the large number of papers in the field, there has never been a precise universally accepted definition of OPN has never existed. For example, according to the Acute Dialysis Quality Improvement Working Group (Acute Dialysis Quality Initiative -ADGI), by 2002, more than 35 definitions of AKI were in use, and there was not even a consensus on the criteria for initiation of renal replacement therapy.

The ADGI's RIFLE classification reflects the staging of kidney damage, which defines three ascending stages of acute kidney injury: Risk, Injury, Failure, based on a comparative increase in serum creatinine and \ or decrease in diuresis. In addition, there are two other stages: Lost and terminal renal failure (Endstagerenaldisease). Classification RIFLE establishes a time limit of 3 months, after which time a patient with an acute lesion is considered chronic. [78, c. 245].

In acute kidney injury, oliguria (diuresis less than 400 ml per day or 20 ml per hour) develops, anuria decreases to 100 ml per day of urine, there is an absence or reduction of urine flow into the bladder. Diagnosis of OPN is made mainly on the basis of the RIFLE criteria, which were mentioned earlier. However, this approach has a number of significant disadvantages. The criteria RIFLE are based primarily on either changes in serum creatinine or SCF. However, neither of these data for OPN is specific and sensitive and appear rather late. According to the results of recent studies, early treatment of OPN is more effective; however, the absence of early markers of OPN leads to delayed initiation of therapy [73, p. 50].

Ultrasound diagnostics (ultrasound) of OPN is one of the best methods of renal diagnostics, as it completely excludes the use of X-ray contrast substances with nephrotoxicity. This method of functional diagnosis allows you to distinguish between OPN and chronic diseases (increase in kidney size, edema of its parenchyma in OPN and decrease in size, nephrosclerosis as a consequence of its chronic pathologies). Ultrasound also allows timely assessment of renal blood flow and thus control the effectiveness of treatment in dynamic study [44, p. 59; 45, p.142].

Performing the method of complex renal ultrasound with duplex vascular scanning allows:

- *Specify the cause of the OPN;
- * prescribe nephroprotective therapy taking into account the cause and prevent the development of multi-organ disorders and irreversible changes in the kidneys;
- * to assess the severity of OPN already on admission to the ward;
- * to evaluate the effectiveness of the current therapy;
- * diagnose the transformation of OPN into CPN in the course of treatment.

Clinical prognostic markers should include: early diagnosis of preeclampsia, adequate assessment of its severity, comprehensive etiopathogenetic therapy and evaluation of its effectiveness with the subsequent choice of time and method of delivery. In addition, predicting the risk of bleeding in labor selection of prenatal prophylaxis, accurate assessment of the volume of blood loss and timely compensation for pathologic losses, and maintenance

of normovolemia. A prognostic criterion for the dire outcome of OPN is the increase in SOFA score, indicating the increasing rate of multiorgan disorders and is also a determinant of the choice of renal replacement therapy[42; p. 8].

Thus, it is necessary to point out that it is necessary to conduct scientific research aimed at predicting such a formidable complication of obstetric pathologies as OPN, to determine the stages of prevention and qualified rehabilitation therapy for the full restoration of renal function and improvement of reproductive health of women of childbearing age.

Features of rehabilitation of patients who have undergone acute renal failure of obstetric etiology.

Rehabilitation of OPN survivors remains a serious problem, occupies an important place because of the severity of the pathology, a sharp decrease in the quality of life, the need for expensive methods of replacement therapy and kidney transplantation. Despite the extreme severity of the disease, with modern methods of treatment, recovery occurs. Sometimes functional changes of kidneys remain, the degree and duration of which affects the rehabilitation of such patients[30; p. 160].

Many studies have shown that the recovery stage begins from the moment of normalization of azotemia and runs very long, full recovery either does not occur at all, or can be stated only 2-3 years after OPN. There is a possibility of the development of CKD in patients who did not suffer before OPN kidney disease, and the group of pregnant women with extragenital pathology, especially with chronic kidney disease, the risk of OPN obstetric etiology increases. Scientists have proved that with the onset of the recovery period is not a complete recovery of renal function, for at least 6 months there is a moderate azotemia, a decrease in glomerular filtration and tubular reabsorption. Moderate proteinuria and anemia continue, and the urine sediment will contain erythrocytes, leukocytes, granular and hyaline cylinders [6; p. 17].

According to scientific studies Avakov V. E. (1991.) in 2 months after OPN there was a significant impairment of renal function, and in 6 months revealed a significant improvement in general clinical and biochemical indicators of blood and urine, normalization of COP, but renal function remained impaired, which was expressed in a significant decrease in glomerular filtration (CF) and tubule reabsorption (CR), subnormal urea and creatinine in the blood, polyuria and nicturia. He also proved the negative influence of the initial state of the kidneys on their functional capacity after OPN and excessively slow recovery of renal functions against the background of obstetric pathologies [5; p. 7].

The duration of recovery of functional capacity of kidneys after OPN caused by obstetric pathology, the possibility of its aggravation by the action of various aggressions on the body allows us to consider that such contingent of patients should be on dispensary monitoring under strict control until the full recovery of functional fullness of kidneys for at least 2-3 years. Dispensary monitoring should include the following measures:

* At least once a month (during the 1st year) determination of the general blood and urine analysis, the level of nitrogenous slag in the blood, examination of patients in the outpatient clinic by a nephrologist or therapist, and to address issues of contraception obstetrician-gynecologist;

* Comprehensive examination of renal function, including modern functional diagnostic methods (ultrasound scanning, renal vascular Dopplerometry, MSCT) at least once or twice a year;

* In the presence of clinical and laboratory OPN, symptomatic hospitalization in renal centers of regional or national importance;

* If the appearance of an increase in nitrogenous slag in the blood without clinical symptoms - outpatient prophylactic courses of treatment (standard).

It is necessary to pay great attention to the correction of extragenital diseases present before pregnancy and to address the choice of adequate contraception [59; p. 73].

Given the pathological course of pregnancy and childbirth against the background of not fully recovered renal function, in those who have undergone OPN, it is necessary to address the issue in favor of absolute methods of contraception.

The frequency of OPN in young, the most active in labor and childbearing women, disappointing results of treatment, features of development, clinical course and outcomes of the disease urgently require the continuation of comprehensive study of this formidable complication. Numerous discussion issues of OPN lead to a similar conclusion. There is no consensus in the literature on the very concept of OPN, a sudden onset of anuria or oliguria in previously healthy women or persons with healthy kidneys, especially in women of childbearing age and with pathologic course of gestation and labor.

All of the above dictates the need for careful study of these issues, the search for effective ways of prevention, timely diagnosis and treatment of such a severe complication of pregnancy and labor, which is OPN and rehabilitation of such patients.

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