OPTIMIZING MANAGEMENT STRATEGIES FOR COMPLICATED GESTATIONAL PYELONEPHRITIS

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ABSTRACT

The interaction between pregnancy and gestational pyelonephritis remains an important clinical and public-health concern due to the high frequency of obstetric complications, adverse perinatal outcomes, and severe neonatal morbidity. Chronic pyelonephritis during pregnancy is frequently associated with iron-deficiency anemia (35–70%), pregnancy loss at various gestational stages (15–20%), chronic placental insufficiency (30–35%), and gestosis (35–70%). Additionally, 30–40% of affected pregnancies develop chronic fetal hypoxia, while intrauterine infection occurs in 20–30% of cases, and fetal growth restriction in 12–15%. Chronic renal inflammation markedly reduces maternal adaptive capacity and increases the likelihood of early neonatal mortality.

Relevance. Among pregnant patients, chronic pyelonephritis accounts for the majority of somatic disorders (48–54%). The disease exerts a significant negative influence on both maternal health and fetal development, contributing to elevated risks of miscarriage, preterm labor, placental insufficiency, intrauterine hypoxia, intrauterine infection, gestosis, and complications during neonatal adaptation (V.V. Iremashvili, 2007; L.E. Nicole, 2008; K. Shi et al., 2008; A.J. Schaeffer et al., 2010).

In the chronic stage, the principal pathogenic trigger becomes less dominant; instead, impaired blood rheology and disturbed microcirculation play a leading role, promoting persistent inflammation. These pathological mechanisms create conditions that endanger both mother and fetus, ultimately increasing the likelihood of perinatal complications.

Objective. To determine the most effective approaches to managing complicated forms of gestational pyelonephritis.

Materials and methods. From 2024 to 2025, clinical data were collected from 55 pregnant women and their newborns evaluated at the Perinatal Center of Samarkand (Department of Obstetrics and Gynecology No. 1, Samarkand State Medical University). Participants were separated into two groups:

- Main group: 35 pregnant women diagnosed with gestational pyelonephritis (GP)

- Control group: 20 conditionally healthy pregnant women

The examination protocol included assessment of clinical and anamnestic features, laboratory evaluation for renal inflammatory pathology, ultrasound examination of kidneys and pelvic organs, and monitoring of fetal and fetoplacental status using instrumental diagnostic modalities.

Therapeutic Objectives in Acute GP

Management strategies targeted:

1. Elimination of the primary pathogenic factor;
2. Restoration of normal urinary outflow;
3. Improvement of maternal and fetal condition, with prevention of complications.

All patients received broad-spectrum antibiotics initially, followed by targeted therapy based on culture sensitivity. Infusion therapy (e.g., rheosorbilact) and NSAIDs were used to alleviate intoxication. Herbal uroseptics such as Canephron or Uroseforte were prescribed (2 capsules three times daily) to support renal function. Temporary ureteral splinting was used to relieve urinary obstruction when necessary.

Among the main group, 35 patients required urinary tract drainage due to complications. Nephrostomy was performed in 5 women (14.3%), while 30 women (85.7%) underwent ureteral stenting. In nearly all instances, unilateral kidney drainage was sufficient. The need for drainage predominantly arose during the second and third trimesters; no drainage procedures were performed during early pregnancy.

Polyurethane catheters, stents, and nephrostomy systems from manufacturers such as Cook, Rush, Urovision, and B.Braun were used. Because antireflux mechanisms become ineffective after 6–8 weeks in situ—potentially leading to cystitis, ureteritis, or recurrent pyelonephritis—devices were monitored regularly to maintain safe drainage.

Results and discussion. All participants in the study received individualized conservative therapy, adjusted according to the intensity of both systemic and localized inflammatory responses. The therapeutic protocol consisted of several key components, including:

- Administration of broad-spectrum antibacterial agents based on culture sensitivity results;
- Supplementation with vitamins from the B-complex group to support metabolic and neurological functions;
- Use of antispasmodic medications to alleviate ureteral and renal pelvic spasms;
- Implementation of positional drainage techniques to facilitate urinary outflow and reduce renal congestion;
- Infusion-based detoxification therapy in cases of moderate to severe intoxication;
- Targeted symptomatic management aimed at stabilizing the patient's general condition.

Considering the elevated risk of maternal and fetal complications—most notably the threat of premature delivery—many cases required supplementary interventional procedures in addition to conservative treatment. Ureteral stenting was performed in 30 patients to restore urinary drainage, while percutaneous nephrostomy was carried out in 5 patients. The latter was primarily indicated for individuals diagnosed with grade II–III hydronephrosis or suppurative (purulent) pyelonephritis.

Nephrostomy catheters were generally placed during the second trimester, around the 27th to 28th week of gestation. These drainage systems were maintained until sufficient

improvement was achieved and were subsequently removed during the intrauterine period. Among patients presenting with preeclampsia, nearly 40% exhibited a marked stabilization of arterial blood pressure following comprehensive therapy. The average duration of inpatient treatment was 6.4 ± 0.15 days, after which patients continued recovery under outpatient supervision with regular clinical and laboratory monitoring.

Post-therapeutic laboratory assessments revealed substantial improvements across all hematological and urinary parameters. Specifically, there was normalization of total leukocyte count and erythrocyte sedimentation rate (ESR), as well as complete resolution of bacteriuria and leukocyturia in all individuals belonging to the study cohort. Evaluation of obstetric outcomes demonstrated that preterm labor occurred in only three cases, underscoring the efficacy of timely management. The vast majority of women—33 out of 36 (94.3%)—successfully delivered at term without major obstetric or neonatal complications. Among patients previously diagnosed with fetoplacental insufficiency, 34.3% showed full restoration of placental function following therapy. Despite these encouraging results, approximately 25.7% of neonates had a birth weight not exceeding 3000 grams, with an average neonatal mass of 2745.4 ± 120.5 grams.

In conclusion, the study confirms that prompt diagnosis and integrated management of gestational pyelonephritis are essential for minimizing pregnancy-associated risks and improving both maternal and neonatal outcomes. In cases characterized by advanced hydronephrosis (grades II–III) or purulent inflammation, the combination of urinary drainage procedures and systemic antimicrobial therapy ensures rapid clinical recovery, reduces the likelihood of obstetric complications, and promotes favorable perinatal results.

Conclusion. Pyelonephritis exerts a significant adverse influence on pregnancy and fetal development, contributing to increased risks of miscarriage, preterm delivery, placental insufficiency, fetal hypoxia, intrauterine infection, gestosis, and difficulties during neonatal adaptation. Pregnant women with gestational pyelonephritis demonstrate a high susceptibility to infectious complications. Early pregnancy is often marked by toxicosis and threatened miscarriage, while from 20–24 weeks onward, many develop pyelonephritis and hydronephrosis; gestosis was observed in 40% of cases.

Comprehensive treatment—including nephrostomy when indicated substantially improves hematologic and urinary biomarkers, decreases complication rates during the second and third trimesters, and enhances pregnancy and neonatal outcomes compared to standard therapeutic approaches.

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