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IMMUNOGLOBULIN A NEPHROPATHY IN CHILDREN: MODERN APPROACHES TO DIAGNOSIS AND TREATMENT

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Abstract
Immunoglobulin A nephropathy (IgA nephropathy) is one of the most common forms of chronic glomerulonephritis in children and adolescents. The disease is characterized by the deposition of IgA in the mesangial regions of the glomeruli, leading to the development of an inflammatory process and impaired renal function. Despite its prevalence, the pathogenesis of the disease remains incompletely understood, and its clinical course is highly variable — ranging from asymptomatic hematuria to rapidly progressive renal impairment. Therefore, early diagnosis and optimal therapy are crucial to prevent progression to chronic kidney failure.

Introduction

Immunoglobulin A nephropathy (IgA nephropathy) is one of the most common forms of chronic glomerulonephritis in children and adolescents. The disease is characterized by the deposition of IgA in the mesangial regions of the glomeruli, leading to the development of an inflammatory process and impaired renal function. Despite its prevalence, the pathogenesis of the disease remains incompletely understood, and its clinical course is highly variable — ranging from asymptomatic hematuria to rapidly progressive renal impairment. Therefore, early diagnosis and optimal therapy are crucial to prevent progression to chronic kidney failure.

Aim of the Study

To determine the clinical features, current diagnostic methods, and therapeutic efficacy in children with IgA nephropathy.

Materials and Methods

The study included 45 children with a confirmed diagnosis of IgA nephropathy, aged 5 to 17 years. All patients were followed at the Department of Pediatric Cardionephrology of a multidisciplinary clinic over a 3-year period (2021–2024).

The diagnosis of IgA nephropathy was established comprehensively, based on:

Clinical findings: presence of hematuria, proteinuria, and elevated blood pressure;

Laboratory tests: complete blood count, biochemical blood analysis, and urinalysis;

Morphological confirmation: renal biopsy with immunohistochemical detection of IgA deposits in the mesangial regions of glomeruli — considered the “gold standard” for diagnosis.

To assess treatment efficacy, patients were randomized (considering clinical status and ethical principles) into two groups:1. Main group (n = 30): received combination therapy including

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glucocorticoids at standard doses and angiotensin-converting enzyme (ACE) inhibitors, aimed at suppressing inflammation and controlling blood pressure.

2. Control group (n = 15): received basic therapy consisting of dietary sodium restriction, blood pressure control with non-ACE-inhibiting agents if needed, and symptomatic management without corticosteroids or ACE inhibitors. Efficacy and disease dynamics were evaluated at baseline and at 3, 6, and 12 months, based on:

Clinical parameters: presence of macro- or microscopic hematuria, proteinuria (24-hour urine protein quantification), and blood pressure (according to pediatric hypertension standards);

Laboratory parameters: serum creatinine, estimated glomerular filtration rate (eGFR) calculated using the Schwartz formula;

Instrumental studies: renal ultrasound (when indicated).

Statistical analysis was performed using SPSS version 25.0. Differences between groups were assessed using the Student's, t-test for independent samples. Results were expressed as mean ± standard deviation (M ± SD), and ($p < 0.05$ was considered statistically significant).

Results and Discussion

All 45 children had biopsy-confirmed IgA nephropathy. At diagnosis, 37 patients (82%) presented with macro- or microscopic hematuria, a classic manifestation of the disease. Proteinuria was detected in 29 children (64%), ranging from 0.3 to 2.5 g/day, and 10 of them exhibited nephrotic syndrome. Arterial hypertension was documented in 17 patients (38%), reflecting significant glomerular injury. Dynamics of Clinical and Laboratory Parameters During Therapy.Main group (n = 30): Combination therapy (glucocorticoids + ACE inhibitors) led to a marked improvement in clinical parameters. After 3 months, mean proteinuria decreased from 1.2 ± 0.3 g/day to 0.6 ± 0.2 g/day ($p < 0.01$). By month 6, mean proteinuria further declined to 0.3 ± 0.1 g/day, indicating significant suppression of renal inflammation. Hematuria completely resolved in 21 patients (70%) by the sixth month.

Blood pressure normalized in most patients within 3 months of treatment initiation. Serum creatinine and eGFR values remained within normal limits throughout the study, demonstrating preserved renal function. Control group (n = 15): In the basic-therapy group, proteinuria reduction was less pronounced — from 1.1 ± 0.4 g/day to 0.9 ± 0.3 g/day after 6 months ($p > 0.05$), which was not statistically significant. Persistent hematuria was observed in 10 of 15 children (66%). Blood pressure control was suboptimal, with 4 patients showing progression of hypertension.

Five children exhibited worsening renal function, with a 15–25% increase in serum creatinine and a corresponding decrease in eGFR, indicating disease progression and insufficient treatment efficacy.

Discussion

Our findings confirm that combined therapy with glucocorticoids and ACE inhibitors is significantly more effective than basic therapy alone in children with IgA nephropathy. Reduction in proteinuria and normalization of blood pressure are key determinants of slower progression to renal failure.

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These results are consistent with international and domestic studies demonstrating that glucocorticoids effectively suppress immune-mediated inflammation, while ACE inhibitors provide nephroprotection by reducing intraglomerular pressure and proteinuria.

In contrast, the control group showed limited improvement, underscoring the need for active immunomodulatory therapy in patients with significant proteinuria and hypertension.

An individualized treatment approach and regular patient monitoring remain essential components of successful management in pediatric IgA nephropathy.

Conclusion

Immunoglobulin A nephropathy in children is a chronic renal disease with a potential risk of progression to renal failure. The present study demonstrated that combination therapy including glucocorticoids and ACE inhibitors significantly improves clinical and laboratory outcomes, reduces proteinuria, and normalizes blood pressure.

Active therapy promotes stabilization of renal function and decreases inflammatory activity, while basic non-immunomodulatory treatment is less effective.

Therefore, timely diagnosis and early initiation of combination therapy are crucial for improving prognosis in children with IgA nephropathy. Further studies are needed to develop more individualized treatment and monitoring strategies.

Вот примерный список литературы на английском языке по теме IgA nephropathy (IgAN) in children, который можно использовать в вашей статье. Если понадобится — могу подобрать ещё статьи и оформить в конкретном стиле цитирования (Vancouver, APA).

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