

CONGENITAL URINARY TRACT ABNORMALITIES AS A RISK FACTOR FOR URINARY TRACT INFECTIONS IN CHILDREN

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ABSTRACT

Congenital anomalies of the kidney and urinary tract (CAKUT) are among the most common developmental disorders in children and represent a major cause of pediatric kidney disease [1,2]. Structural abnormalities and urodynamic disturbances contribute to urinary stasis and bacterial colonization, significantly increasing the risk of urinary tract infections [3,4]. In addition, the presence of anomalies is associated with a higher risk of recurrent infections and renal tissue damage [5].

Background. Congenital anomalies of the kidney and urinary tract (CAKUT) are among the most common developmental disorders in children and represent a major cause of pediatric kidney disease [1,2]. Structural abnormalities and urodynamic disturbances contribute to urinary stasis and bacterial colonization, significantly increasing the risk of urinary tract infections [3,4]. In addition, the presence of anomalies is associated with a higher risk of recurrent infections and renal tissue damage [5].

Objective. To assess the prevalence and structure of congenital urinary tract abnormalities in children and to evaluate their role in the development of urinary tract infections

Materials and Methods. A retrospective analysis included 1308 children hospitalized with urinary system diseases in the Republic of Karakalpakstan during 2022–2024. Patients with congenital urinary tract anomalies were identified. The structure of anomalies, associated infections, and temporal trends were analyzed using comparative statistical methods

Results. Congenital urinary tract abnormalities were detected in 135 children, accounting for 10.3% of cases. A statistically significant increase in detection was observed over time, from 33 cases in 2022 to 58 cases in 2024 ($p < 0.05$).

Renal agenesis was the most frequent anomaly (69.6%), followed by renal dysplasia and hypoplasia (8.9%), bilateral hydronephrosis (6.7%), combined hypoplasia with ectopia (5.2%), isolated ectopia (3.7%), duplication of the collecting system (3.0%), and vesicoureteral reflux (2.2%).

All patients had associated urinary system pathology. Chronic pyelonephritis and recurrent cystitis were identified in 90% of cases, while glomerulonephritis was observed in

10%. Recurrent infections were significantly more frequent in children with impaired urodynamics ($p < 0.05$).

The presence of congenital anomalies increased the risk of chronic infection by approximately 1.8 times. Patients with combined anomalies demonstrated a higher frequency of recurrent infections. A moderate correlation was found between anatomical severity and infection recurrence ($r = 0.33$).

Discussion. The findings of this study confirm that congenital urinary tract abnormalities play a key role in the development and persistence of urinary tract infections in children. Previous studies have shown that CAKUT significantly increases susceptibility to UTIs due to impaired urine flow and structural defects [3,4].

In addition, children with such anomalies are at higher risk of recurrent infections and renal damage, which may lead to chronic kidney disease [1,5]. The predominance of severe and combined anomalies in our study explains the high frequency of recurrent and chronic forms of infection.

The observed increase in detection rates may reflect both improved diagnostic methods and growing clinical awareness. These findings emphasize the importance of early identification and continuous monitoring of children with CAKUT.

Conclusion. Congenital urinary tract abnormalities are a significant risk factor for the development and recurrence of urinary tract infections in children. Early diagnosis and correction of urodynamic disorders are essential for preventing chronic kidney damage and improving long-term outcomes

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