Review

by Prof. Dimitrichka Ducheva Bliznakova, MD, PhD

Medical University - Varna

Member of the Scientific Jury, appointed by order P-109-518/16.12.2025 of the Rector of the Medical University – Varna and protocol No. 1/17.12.2025 of the Academic Council

Re: competition for the award of the academic degree "Doctor" to Ivelina Lyudmilova Hristova-Nikolova, MD

Dr. Ivelina Lyudmilova Hristova-Nikolova was born on February 24, 1993, in the town of Tryavna. She completed her secondary education at the Ivan Gyuzelev Mathematics and Natural Sciences High School in Gabrovo in 2012. In 2019, she graduated in medicine from the Medical University in Varna.

Professional development

- Since 2019, she has been working at Dr. Vanya Alexandrova Outpatient Clinic.
- In 2023, she obtained a specialization in General Medicine.

Academic development

- Since 2019, she has been an Assistant Professor at the Department of General Medicine.
- Since 2020, she has been enrolled as a doctoral student at the department.

Articles and papers related to the dissertation - 5.

Participation in scientific congresses, conferences, symposia:

- 2 participations related to the topic of the dissertation.

Membership in professional organizations:

- Bulgarian Medical Association;
- Association of General Medicine Educators and Researchers in Bulgaria;
- European Academy of Teachers in General Practice (EURACT).

Languages of communication:

- Bulgarian;
- English.

Topic of the dissertation of Dr. Ivelina Lyudmilova Hristova-Nikolova for the award of the educational and scientific degree of "Doctor":

Congenital anomalies of the kidney and urinary tract in children under 3 years of age.

The doctoral candidate examines one of the leading problems in pediatric nephrology – congenital anomalies of the kidney and urinary tract (CAKUT). Their significance is determined not only by high frequency. They are the cause of chronic kidney disease (CKD) and early disability in children when diagnosis is delayed due to ignorance of their manifestations.

The dissertation is well structured. It contains 220 pages with appropriate distribution of: literature review, purpose and tasks, materials and methods, results and discussion, conclusion, inferences, contributions. A total of 407 literature sources are used, 5 of which are in Cyrillic.

The literature review describes in detail: the embryonic development of the urinary system; types of congenital anomalies, as well as the reasons for their formation, such as family history and genetic predisposition; influence of premature birth on their formation and subsequent development of CKD. The role of the general practitioner (GP) in conducting screening for early CAKUT diagnosis is emphasized. Particular attention is paid to newborns in families with CAKUT, children small for their gestational age, as well as those born with anomalies of other organs and systems or with syndromes. The literature review analyzes parents' awareness, knowledge, and attitudes toward prevention with the aim of

detecting and confirming CAKUT. The role of fear and anxiety, which are among the important factors for refusing testing, is emphasized. Attention is drawn to parents' awareness of the leading symptoms of CAKUT complications and timely referral to a GP.

The creation of a national CAKUT register is of utmost importance for the clinical practice of nephrologists and GPs.

The purpose of the dissertation is precisely and clearly formulated.

Six tasks are set. The first task aims to study the practices and knowledge of GPs when CAKUT is suspected. The second task is to evaluate prevention and pediatric consultations with GPs for the diagnosis and timely treatment of CAKUT. The third task is particularly important, as it sets the ambitious goal of developing a diagnostic algorithm for use in GP practice for the early detection of CAKUT. The importance of tasks 4, 5, and 6 concerns parents: their attitude toward screening programs, awareness, and knowledge of the first signs of the most common complications of UTI—urinary tract infections. There are four working hypotheses.

Material

The study covers 292 parents of children under 3 years of age and 96 GPs in the Varna region. Approval was obtained from the Ethics Committee with protocol No. 125/26.01.2023. The criteria for inclusion and exclusion in the study are precisely defined.

Two parallel independent studies were conducted.

- First study. A questionnaire with 31 questions was developed, covering parents' knowledge, awareness, and attitudes towards screening tests.
- Second study. A questionnaire with 22 questions was developed. The routine of GPs for conducting screening tests in the presence of urinary tract infection was assessed.

Methods

The following methods were used to process the information: documentary, sociological, and statistical methods. The results obtained are presented in tables and graphs comparing the data and highlighting the main dependencies and trends.

Results

A total of 96 GPs who treat children aged 0-3 years in their outpatient practice were surveyed. The GPs were distributed by age, gender, experience, and average time spent on a pediatric consultation.

The percentage of GPs aged 46-55 was higher, with a predominance of women. The predominant length of experience of the participants was 16-20 years. The average time spent on a pediatric consultation was between 10 and 20 minutes. A higher percentage of GPs havd children with CAKUT in their practice. An extremely high percentage (87.5%) of GPs implemented the screening program. Refusal by parents to implement the program was 8.3%. The analysis and results of the study showed that GPs were extremely well acquainted with the first symptoms of UTI (94.8%). In 86.5% of GPs, data on asymptomatic bacteriuria was provided when conducting screening laboratory tests. In 45.8% of GPs, there was a family history of CAKUT in children. In children with CAKUT, another anomaly of the individual systems was found in 42.4%. The results show that CAKUT was most commonly diagnosed in children under 6 months of age. In 9.4% of cases, CKD developed against the background of an underlying anomaly.

The predominant age group of the surveyed parents was 26-35 years.

In 20.1% of cases, UTI was diagnosed in response to a high temperature with an unclear temperature status. Recurrent UTI were observed in 6% of these cases.

Of the parents surveyed, 67.1% reported visiting a pediatric clinic. Parents were informed about UTI symptoms in 44.9% of cases. Parents were surveyed about risk factors for developing a UTI in 13.7% of cases, and in 74% of cases they were not informed about possible complications after UTI.

In 11.7% of the children of the surveyed parents, CAKUT was observed at the first examination, and some of them required a repeat examination for follow-up.

A family history of CAKUT was observed in 8.6%.

Mothers of children with CAKUT reported urinary tract problems during pregnancy.

In 17.1% of parents, no consultation with a pediatric nephrologist was conducted.

Discussion

Once again, the discussion highlights the frequency of CAKUT and its role in the development of CKD. An official inquiry was made to the Regional Health

Insurance Fund in Varna regarding preventive screening for CAKUT, the percentage of patients diagnosed with CAKUT, and how many of them developed CKD. The following data was received for the period from January 1, 2020, to December 31, 2024. A total of 15 619 referrals were issued by GPs for screening during this period, which was more than twice the number reported by a pediatric nephrologist. The reasons given were that some of the patients did not use the referral because they had a paid examination or did not have an examination, regardless of the GP's recommendation. Of the examinations carried out by a pediatric nephrologist for the early detection of CAKUT, 1 905 infants were diagnosed, representing 12.5% of the total 15 619 referred for preventive examination. Five children were registered with CKD, and three of them had CAKUT.

76% of the surveyed GPs reported having children with CAKUT in their practices, with 42% of them having abnormalities in other organs and systems. The results show that in 50% of cases, CKD was diagnosed between 0 and 6 months of age, and only in 6.3% between 1 and 3 years of age.

The study found that the national program for CAKUT prevention was implemented in 87.5% of cases. Laboratory tests of blood count and urine at 6 months and 1 year were performed in 96.4% of the GPs surveyed. UTI symptoms are described in the program, which should prompt parents to seek consultation with a GP, who in turn should rule out CAKUT after consulting a pediatric nephrologist and performing an ultrasound examination. The relationship between the experience of GPs and the time they spend on pediatric consultations was analyzed. Younger doctors spent 10-15 minutes, while more experienced ones spent 20-30 minutes. An analysis was also made when a suspicious urine test result was obtained. In 92.6% of cases, GPs additionally prescribed a urine culture.

A preventive examination by a pediatric nephrologist was performed in 80.8% of the children of the surveyed parents, and in 18.8% a second examination was performed for follow-up purposes.

A correlation was sought in the practice of GPs to inform parents about upcoming preventive examinations and the correct way to collect urine. The analysis shows that 237 parents (84.3%) answered "Yes."

In a survey of parents of children aged 0-3 years, 11.7% of respondents reported that their children had been diagnosed with CAKUT. A link with genetic defects was also sought. The analysis of the data shows that familial burden was common

in families with CAKUT. Of all parents who reported a child with CAKUT, 50% indicated the presence of another family member with an anomaly. In the group of parents without CAKUT, only 6.4% reported a similar burden.

Analysis of data on the influence of external and internal factors on the development of CAKUT during pregnancy showed that mothers of children with CAKUT more often report health problems during pregnancy. The most common were diabetes (33.3%), infectious diseases (12.1%), vaginal infections (6.1%), UTIs (3%), and in very rare cases preeclampsia, and eclampsia. The results of a survey conducted among parents for the diagnosis of UTI in cases of unclear temperature status were also reported. Only 20.1% of children had this symptom. The survey found that 55.1% of parents were not familiar with the first symptoms of UTI.

Once again, the need to develop a national registry of children with CAKUT, especially if they are diagnosed before the age of 3, was emphasized. This would play an important role in the prevention of CKD. On the other hand, improving parents' awareness, their responsibility for screening the urinary system, and follow-up in cases of proven abnormalities would reduce patient disability and improve quality of life.

Conclusions

When there is an idea, a corresponding plan is drawn up and the tasks set are successfully implemented. This is shown by the conclusions drawn. In her in-depth study, Dr. Ivelina Lyudmilova Hristova-Nikolova's dissertation proves the role and importance of CAKUT for the development of CKD.

The conclusions are based on the study. They confirm the significance of the problem of CAKUT in children under 3 years of age. The CAKUT outpatient practice of GPs is reported, as well as the presence of such anomalies in other family members. The need for regular visits to pediatric consultations, which is only 67.1%, is emphasized. The awareness of parents regarding the first manifestations of UTI is reported. According to the doctoral student's data, only 15.6% of parents seek information from GPs about risk factors for the development of UTIs.

The contributions are summarized in two groups:

- Original scientific and applied contributions.

The first study in Bulgaria on CAKUT among the pediatric population and the role of GPs and parents in detecting and managing this pathology is extremely valuable.
For the first time, a study was conducted among GPs on screening and practices for the early diagnosis of CAKUT.
For the first time, a study was conducted among parents on their awareness and attitude towards screening.
A practical algorithm for early diagnosis and GP behavior in children with CAKUT has been developed.

- Contributions of a confirmatory nature.

  The key role of CAKUT in the development of CKD in childhood is confirmed.
  The role of screening tests and clinical practices for CAKUT in the early CAKUT diagnosis is confirmed.
  The need for parental awareness and education is confirmed.

The materials presented for the competition by Dr. Ivelina Lyudmilova Hristova-Nikolova reflect her in-depth work as a general practitioner, her scientific research, and her theoretical training. Her dissertation confirms it. It examines an extremely important problem in pediatric nephrology—the role of congenital anomalies of the urinary tract and the possibility of their timely detection and diagnosis. What is valuable is that this problem is presented through the eyes and experience of a general practitioner.

Dr. Ivelina Lyudmilova Hristova-Nikolova set herself an ambitious goal that required dedication, hard work, and competence. My review of the materials provided gave me reason to give a positive assessment. We are all convinced that knowledge is a treasure that follows its owner everywhere.

February 14, 2026

Prof. D. Bliznakova, M