

REVIEW

**In connection with a dissertation work for awarding the educational and scientific degree
"DOCTOR" on the topic: "CLINICAL PRESENTATION AND PREVENTION OF THE RISK OF
DEVELOPING URINARY TRACT INFECTIONS IN CHILDHOOD"**

Author of the dissertation:

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Prepared the review –

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The dissertation work has been discussed and directed for public defense by the Departmental Council of the Department of General Medicine at the Medical University "Professor Dr. Paraskev Stoyanov" - Varna.

The review was prepared according to the Law on the Development of the Academic Staff (LAD), the Regulations for the Application of the LAD (PRDLA) and the Regulations for the Terms and Procedures for Acquiring Scientific Degrees and Holding Academic Positions (PURPNSZAD) at the Medical University of Varna.

The presented set of materials on paper/electronic media is in accordance with the procedure for acquiring the scientific and educational degree "doctor" and the regulations of the MU - Varna. I do not detect plagiarism when reviewing the dissertation work, abstract and publications related to the dissertation development provided to me for the preparation of a thesis.

I declare the absence of joint scientific developments with the doctoral student and a potential conflict of interest.

Childhood urinary tract infections (UTIs) are a common problem in primary care (PHC).

The most common difficulties encountered by the frontline physician are:

- Difficulties in identifying PPIs due to the lack of a typical clinical course, especially in infants and early childhood.
- Mistakes are allowed when collecting urine for examination and interpreting the result of the examination of urine and uroculture.
- There is not enough time allocated during children's consultations. Currently, the organization of the health system does not allow qualitative examinations, and the mixing of healthy and infectious patients in the waiting room of the GP puts healthy children at risk and suggests quantitative examinations at the expense of quality.
- There is a lack of awareness and knowledge of parents about STIs in childhood.
- There is no algorithm for behavior in case of suspicion of PPI, diagnosis, treatment and prevention of the disease in PMP.
- Administering antibiotic treatment on another occasion without conducting urinalysis masks the picture of PPI. Treatment of children with recurrent PPIs, repeated courses of antibiotics, or long-term prophylactic antibiotics puts patients at risk for infections with multidrug-resistant

organisms. In addition, recurrent PPIs are also associated with the risk of renal failure and parenchymal damage with long-term health consequences.

All these features contribute to contradictions and difficulties in timely diagnosis and treatment.

The indicated data motivated the choice of topic by Dr. Raditsa Aleksovska - "CLINICAL PRESENTATION AND PREVENTION OF THE RISK OF DEVELOPING URINARY TRACT INFECTIONS IN CHILDHOOD"

Structure of the dissertation:

The dissertation contains 178 typewritten pages and is illustrated with 48 tables, 26 figures.

The ratio overview: methodical: result-analysis part is optimal, respectively 40:10:50%. 314 titles, of which 22 in Cyrillic and 292 in Latin.

Most of the cited titles are directly related to the research problem. In connection with the dissertation work, five scientific articles have been published in refereed and indexed journals with scientific content, as well as journals referenced in an international database, and fragments of the dissertation work have been reported in national forums. Based on the above, the doctoral student's publication activity is optimal and meets the criteria for acquiring the scientific and educational degree of doctor.

Characteristic features of work:

The topic of the dissertation "CLINICAL PRESENTATION AND PREVENTION OF THE RISK OF DEVELOPING URINARY TRACT INFECTIONS IN CHILDHOOD" is well chosen in terms of the importance of the problem, relevance at the present moment and projection into the future. The design of the present study is cross-sectional, which combines a retrospective analysis of medical records (epicrisis) and a prospective one realized by means of two questionnaire surveys.

Essentially, three parallel studies were conducted, emphasizing the problem as a whole:

- Survey "IPP - survey for parents"

The study aims to assess the knowledge, practices and attitudes of parents regarding PPIs.

- Study "OPL AND STI IN CHILDHOOD"

Investigating GP practices regarding STIs, as well as the possibility that child counseling can be used as a tool to reduce the risk of developing STIs, with GPs spending enough time to give clear recommendations and accurate information to parents.

- Retrospective analysis of medical records

Clinical-laboratory and instrumental studies were reported among the affected contingent of children

The object of the conducted study are 126 parents, 27 general practitioners from the region of Varna, Burgas and Dobrich and a retrospective analysis of medical documentation (epicrisis) of 110 patients. The dissertation work was approved by KENY of the Medical University - "Prof. Dr. Paraskev Stoyanov" - Varna with Protocol No. 94 25.06. 2020

This is the first in-depth study in our country on the current problems regarding PPIs in childhood, including general practitioners and parents, with a view to establishing the most common reasons that make timely diagnosis difficult. In addition, modern trends and the main causes of difficulties in diagnosis, symptoms in clinical presentation, preparation and rules for taking a laboratory sample and its reliability are established. A significant emphasis is placed on the need for continuous training of both the medical specialists involved and the parents in order to provide timely care and improve the outcome of the complex therapeutic regimes.

The literature review as systematic and analytical when examining the available information presents the doctoral student as a leading expert on the issue.

The definition of childhood urinary tract infections, their etiology, incidence and pathogenesis, assessment of the risk of developing a UTI, studies for evidence, prevention, treatment and prognosis, the need for continuing education as a tool to increase awareness and commitment of the medical professionals on the one hand and the family environment on the other. The actual prerequisites for the study are derived from the review in the form of a conclusion.

The purpose of the dissertation is clearly and precisely formulated - to study the peculiarities of the clinical picture and course of PPI, as well as to identify the factors that make timely diagnosis difficult in order to improve the possibilities of risk prevention for their development in childhood.

The following tasks have been created:

- 2.1. To analyze data on the peculiarities of the clinical picture and the course of PPIs in childhood, obtained from medical records.
- 2.2. To identify the most common risk factors for the development of PPIs in childhood.
- 2.3. To analyze the therapeutic measures for PPIs in childhood.
- 2.4. To determine the GP's approach to PPIs in childhood.
- 2.5. To investigate parents' knowledge, attitudes and practical skills about STIs in children.
- 2.6. To study the sources of information and the need to develop and present informational materials to parents related to STIs in childhood in our country.
- 2.7. To develop a behavior algorithm for PPIs in childhood to help GPs.

The methodology of the study in relation to the studied indicators is appropriate in view of reliability and credibility of the reported results and includes

- Documentary – analysis of documents and literary sources and normative documents relating to the problem of IPP in Bulgaria and worldwide.
- Sociological – 2 questionnaire studies on the knowledge, attitudes and practices of parents regarding PPI, we identified the most common reasons that make it difficult to make a timely diagnosis from the GP's point of view, as well as the most common risk factors for the development of PPI.
- Statistical methods

The obtained results are convincing and presented clearly, accurately - in general for the studied contingent, as well as by subgroups, giving the opportunity to track and compare the data. Fully appropriate statistical methods were used to obtain them.

The main results of Dr. Aleksovska's work can be summarized in the following guidelines:

1. The clinical presentation of PPI is very varied and nonspecific, especially in infants and young children, and this is one of the leading reasons for delayed or missed diagnosis of PPI. Fever may be the leading or only symptom. In older children, typical symptoms are dysuria, frequent urination, secondary incontinence, abdominal or back pain, pain above the pubis, and positive succussio renalis.
2. Parents most often associate the unpleasant smell of urine with PPI, and in the absence of this symptom, they almost do not admit a problem with the urinary system. Children report crying or, less commonly, discomfort during urination.
3. The main reasons for more difficult detection, resp. delay in establishing PPI in childhood in primary care are: relatively low prevalence of PPI in children, lack of information among parents regarding recognition of the non-specific characteristics of the course of PPI in childhood, as well as difficult urine collection in young children .
4. Parental experience with urine tests has difficulties. Urine collection was a challenge for over 30% of parents, and 18.3% of them stated that they did not receive sufficient explanations on how to collect urine for their child's testing.
5. GPs prefer adhesive bags to 'clean catch', catheterisation or suprapubic aspiration in infants for urine collection as the method is non-invasive and 'easy to use'. But they also reported disadvantages: high contamination rate, high effort on the part of parents, loss of valuable time for sampling due to failed attempts and subsequent delay in diagnosis and treatment
6. Ultrasound examination is recommended for any suspicion of IPP, even before the child is 6 months old, as a harmless, repeatedly applicable follow-up method with a high informative value for structural deviations from the excretory system

7. Knowledge of risk factors by GPs and awareness of parents is essential to prevent or reduce STIs in childhood. Failure to identify young patients at risk can lead to kidney damage with consequences in adulthood.
8. Additional training is needed to increase the qualification of health workers regarding PPIs and to improve the awareness and health culture of parents and their trust in medical professionals.

The conclusion corresponds to the results obtained, the same applies to the conclusions drawn. The contributions of the dissertation are of a marked scientific-applied nature, well formulated and are the result of the research. An extremely good impression is made by the successful attempt to systematize the data after its presentation and emphasize the practical nature of their commenting, which is a prerequisite for formulating practical recommendations to support daily practice. As a consequence of the dissertation work, they were formed

- An algorithm of action in general medical practice for suspected UTI and recurrent UTI in childhood, which would be useful for any GP.
- Rules of action in the form of an educational brochure and poster, with the help of which GPs will inform parents about STIs in childhood.

I believe that the topic of the doctoral course and the amount of work completed meet the legal requirements for a successful defense of a doctoral thesis. The acquired specialty in general medicine by the doctoral student contributes not only in terms of scientific research, but also visibly in the practice of the medical profession.

In conclusion, the dissertation presented by **Dr. Raditsa Aleksovskaja** contains scientific, scientific-applied and applied results, which represent an original contribution to science and meet the requirements for awarding the educational and scientific degree "DOCTOR". The dissertation shows that the doctoral student has in-depth theoretical knowledge and professional skills in the scientific specialty, demonstrating qualities and skills for independent conduct and discussion of scientific research.

On these grounds, I vote positively and propose to the respected members of the Scientific Jury to vote positively and propose to the Rector of the MU - Varna to award the scientific and educational degree "doctor" in the doctoral program of general medicine to Dr. Raditsa Aleksovska.

A handwritten signature in blue ink, appearing to be 'Arman Postadzhiyan', written in a cursive style.

23.01.2023

Prof. Dr. Arman Postadzhiyan, MD, PhD

Medical University of Sofia