

REVIEW

by Assoc. Prof. Dr. Tosho Yordanov Ganev Ph.D.,
 Medical University "Prof. Dr. Paraskev Stoyanov", Varna
 Faculty of Medicine, Department of Urology, Department of Surgical Diseases
 Chairman of the scientific jury determined by order of the Rector of MU-Varna № P-109-38 /
 20.01.2022 and protocol of Faculty Council № 57 / 21.12.2021 in the field of higher education 7.
 "Health and Sports", Professional field 7.1 "Medicine" and doctoral program "General
 Medicine".

Brief biographical data and professional development

Dr. Petar Atanasov Kosev was born on April 25, 1984. He graduated in 2003 from the High School of Mathematics "Dr. Petar Beron" - Varna. In 2009 he graduated with a degree in Medicine from the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna. He completed a diploma internship in surgery and pediatrics at the University Hospital in Bari, Italy under the Erasmus student mobility program, and at the end of his studies he won an award for Bulgaria to the selection of 2,000,000 announced by the European Commission for Higher Education. / The two millionth / Erasmus student. He acquired a degree in Urology in 2016, and since 2015 he has been elected an assistant at the Department of General Medicine, Faculty of Medicine at the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna.

His career development began in 2010 as an intern at the Clinic of Nephrology - Transplantation Department at the University Hospital "St. Marina" EAD - Varna, and later conducted his specialization and worked until 2018 at the Clinic of Nephrology. Urology at the University Hospital "St. Marina" EAD - Varna. During this period, he was part of a multidisciplinary team responsible for sexual differentiation disorders (DSD) at the same hospital. From 2018 to the present, he works as a urologist at the Clinic of Urology at MHAT "St. Anna" AD - Varna. Dr. Kosev is a member of the Bulgarian Medical Association, European Association of Urology (EAU), the Bulgarian Association of Urology and the European Academy of Teachers in General Practice and Family Medicine (EURACT). He speaks English, Russian, German, and Italian.

The presented dissertation "Features, diagnostic approach and strategy in the treatment of patients with pyonephrosis. Analysis of hospitalized patients for a period of 5 years", examines a multidisciplinary health problem not only in Bulgaria but worldwide.

The dissertation contains 127 typewritten pages and is illustrated with 41 tables, 36 figures and 1 appendix (behavioral algorithm). The literature reference includes 180 literary sources, of which 17 in Cyrillic and 163 in Latin.

The purpose of the dissertation is precise and clear. Aims to study and analyze the methods of diagnosis and treatment of patients with pyonephrosis. Develops an algorithm for behavior in support of hospital and pre-hospital medical practice.

The tasks are properly structured:

- To perform a retrospective demographic analysis of hospitalized patients with pyonephrosis.

- Analysis and comparison of the results of the most common symptoms, laboratory, and imaging studies in patients with pyonephrosis, performed at their diagnosis.
- Study and analysis of bacterial pathogens in patients with pyonephrosis.
- Determining the most common causes of renal obstruction in patients with pyonephrosis.
- To analyze the pathoanatomical diagnoses in patients with pyonephrosis after nephrectomy and to determine the causes of renal parenchymal disorders, as well as to identify the most common concomitant diseases.
- Development of an algorithm for behavior in case of suspected pyonephrosis.

The hypothesis is well thought out and gives an answer to the set goals and objectives.

The object of the dissertation is a retrospective analysis of a total of 166 patients with pyonephrosis, who were hospitalized and treated at the Clinic of Urology of MHAT "St. Anna" AD, Varna. The current comprehensive, diagnostic, and therapeutic study was conducted over a five-year period (2016 - 2020) and covers two groups of patients who underwent surgical treatment (by performing nephrectomy) and / or open drainage) and percutaneous patients nephrostomy. Excluding criteria are patients under 18 years of age, pregnancy and pathoanatomical diagnosis of concomitant cancer.

In the **methods**, an analysis of the clinical picture was performed: duration of complaints (lumbar pain and fever) before the moment of hospitalization; history of uro-infections up to three months before admission to the hospital; hospital stay of patients regardless of the treatment.

From the laboratory tests, the results were analyzed preoperatively from the levels of leukocytes, hemoglobin, and CRP in the blood. A standard urine test for the absence or presence of protein, blood and bacteria was found preoperatively. Microbiological examination of urine, blood and purulent secretions for common bacterial agents was monitored.

The causes and renal malformations leading to obstruction have been identified and analyzed by imaging (abdominal ultrasound and CT of the abdomen and pelvis).

In all patients, after nephrectomy, the analysis of the pathomorphological diagnosis leading to purulent- necrotic changes in the renal parenchyma was performed.

The incidence of a total of six comorbidities was also studied.

To interpret the data obtained in the dissertation, the dissertation used **statistical analysis** to obtain statistical correlations.

The obtained results are presented extremely well textually and graphically through 41 tables and 36 figures. The statistical processing used is adequate. The discussion is thorough and well systematized. **The conclusions** are 10 in number and logically follow the results of the analysis. They are well worded, clear, and precise:

- Renal lithiasis is the most common pathology and is the leading cause of renal obstruction in patients with pyonephrosis, regardless of the size and position of the calculus (s). Pyelonephritis with all its variants is characteristic of the purulent-destructive renal process.
- The combined use of laboratory tests related to the clinical picture have greater practical value than their independent application for the accurate diagnosis of the process.
- Timely and accurate early diagnosis of severe renal disease in patients with pyonephrosis, as well as their timely surgical treatment are essential for preservation of the affected kidney, rapid improvement, and reduced mortality.

- Independent or combined use of diagnostic imaging methods (abdominal ultrasound, CT scan of the abdomen and pelvis) for rapid differentiation of the condition in an emergency are most widely used in patients with pyonephrosis.
- Regular follow-up of patients with serious chronic diseases and urinary tract infections in the primary and specialized pre-hospital care system can help reduce the preconditions for life-threatening accidents.
- History of IUD, lumbar pain and fever are the most common complaints in patients with pyonephrosis.
- Bacterial causative agents could be different, with *Escherichia coli* being the leading microorganism, but the absence of a specific causative agent is also possible.
- In patients with pyonephrosis, the right kidney is more commonly affected than the left, and the most affected age group is 51 to 80 years, regardless of gender.
- Hypertensive disease is the most common concomitant disease among a total of 6 serious chronic diseases in the studied patients with pyonephrosis. Renal failure and diabetes also play an important aggravating role in the rapid progression of the disease in these patients.
- Wider application of the developed diagnostic and treatment algorithm in patients with pyonephrosis would contribute to early diagnosis and improve the quality and effectiveness of treatment.

The contributions presented are 9 in number (5 with original scientific application and 4 with confirmatory character). They are perfectly acceptable and reflect the meaning of the dissertation.

Original scientific and applied contributions - 5

- Specific, age- and sex-dependent features have been identified in hospitalized patients with pyonephrosis for a 5-year period.
- The most common clinical signs, a constellation of laboratory tests and imaging methods for diagnosis in patients with pyonephrosis have been identified.
- There was a statistically significant positive correlation between the duration of symptoms before hospitalization and hospital stay.
- Cardiovascular disease has been found to be among the most common chronic diseases in patients with pyonephrosis, and diabetes mellitus and chronic renal failure play an important aggravating role as stand-alone and / or concomitant diseases.
- An original diagnostic and treatment algorithm has been developed for patients with pyonephrosis with the possibility of wide application in general medical practice.

Contributions of a confirmatory nature - 4

- The importance of early diagnosis of the condition in patients with pyonephrosis for rapid recovery and reduction of mortality is confirmed.
- The higher diagnostic value of the combined use of ultrasound of the abdomen and CT of the abdomen and pelvis in patients with pyonephrosis is confirmed.
- It is confirmed that urinary lithiasis is the most common cause of obstruction, and pyelonephritis is the most common pathoanatomical process, leading to loss of renal parenchyma with function.
- The importance of timely hospitalization and surgical treatment of patients with pyonephrosis to reduce mortality is confirmed.

The publications provided by the doctoral student are three in number and cover the required publishing activity. The presented abstract is accurate, made with quality, according to the requirements and accurately reflects the dissertation.

Conclusion: The dissertation of Dr. Petar Atanasov Kosev "Features, diagnostic approach and strategy in the treatment of patients with pyonephrosis. Analysis of hospitalized patients for a period of 5 years. "Examines a kidney condition that is difficult to manage in both pre-hospital and hospital practice. An extremely difficult contingent of patients is covered, and the presented algorithm would contribute to improving the collaboration between the different specialties for the purpose of quality, effective diagnosis, and treatment. With a clear goal and objectives, the implementation of the topic meets modern requirements. The dissertation of Dr. Petar Atanasov Kosev contains significant and original results, which are adequately presented in contributions of scientifically applied and confirmatory nature. The developed dissertation meets the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria (LDASRB).

All this gives me reason, as chairman of the scientific jury, to give a positive assessment and recommend its members to vote positively for the educational and scientific degree "Doctor" of Peter Atanasov Kosev in a doctoral program in General Medicine.

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Varna

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/Assoc. Dr. Toshko Yordanov Ganev, Ph.D./