Quality Assessment of Epidemiology, Therapy and Radiological Diagnosis of Renal Colic

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SUMMARY
Objective: The aim of this study is to demonstrate that the majority of patients with renal colic can be treated in an outpatient, conservative methods, and that does not require treatment in a tertiary health care. Patients and methods: The study was retrospective, clinical and manipulative, analytical and descriptive and covers the period from 01.01.2007 to 31.12. 2007 with 1829 patients of both sexes from 15 years upwards.For each patient, the data were analyzed from ambulance and hospital protocol on the Urology Clinic Sarajevo. Results: Of the 1829 patients with renal colic, 56% were men (1029/1829) and 44% were women (800/1829). The highest incidence is recorded in the population aged 35-55 years, where we recorded 817 colic or 44.66%. At the clinic for further treatment were admitted 163 patients or 8.91%. Conclusion: Renal colic usually occurs between the ages of 35-55 years. Men's population gets 1.2 times more frequently than women and the right side is more common than the left. Most patients can be treated in outpatient clinics, conservative therapy, and a small number of cases requiring hospitalization.
Keywords: renal colic, outpatient treatment, conservative treatment, population of 35-55 years.

1. INTRODUCTION

Renal colic is a set of symptoms that are manifested as an intense pain in kidney area of the costovertebral angle. The pain is spasmodic, continuous, with peaks of deterioration. Some patients, the period between the peaks of pain described as a period without pain. Stones are formed mostly in the renal pelvis, and the symptoms of renal pain (colic) occur while descending down the ureter or in case of inflammatory process in which a strong pain occurs. Initial symptoms occur in the form of pain in flank area, which soon became unbearable. The pain then begin to spread to the groin and up to the testicles. In some cases, allthough rarely it happens that the patient faints, however, there are patients who do not complain of pain but of the appearance of blood in the urine (haematuria). Accompanying symptoms include: nausea, vomiting, difficulty and frequent urination. Diagnosis is based on medical history, physical examination, laboratory tests and X-ray analysis (Figure 1).

The basic approach in the treatment of renal colic is symptomatic character. Among pharmacological products mostly applied are: analgetics, antiemetics and spasmolitycs (1, 2, 3). The main reason for renal pain is stretching of the nerves endings, caused by increasing of intraluminal pressure of collecting system and increasing the tension of the wall, caused by acute partial or complete obstruction. The intensity and location of pain can vary from patient to patient due to the size of the renal stone, localization of the stones, the degree of obstruction, the acuteness of obstruction and variation in individual anatomy (intrarenal and extrarenal pelvis, for example). The size of the renal stones does not correlate with the intensiveness of symptoms.

Urinalysis, haematuria (gross or microscopic) is the single most discriminate indicator of a kidney stone (other than the actual passing of gravel or a stone). An estimated 60% to 80% of patients with stones have hematuria (4, 5). In one emergency department (ED) study, acute unilateral flank pain, hematuria, and positive results of abdominal radiography were present in about 90% of patients with a suspected stone. Hematuria may be absent in patients with complete obstruction and in some patients with ureterolithiasis (6, 7). The presence of bacteria and white blood cells in the urine may suggest pyelonephritis (with or without renal stones). Crystals (oxalate, urate, cystine, or struvite)

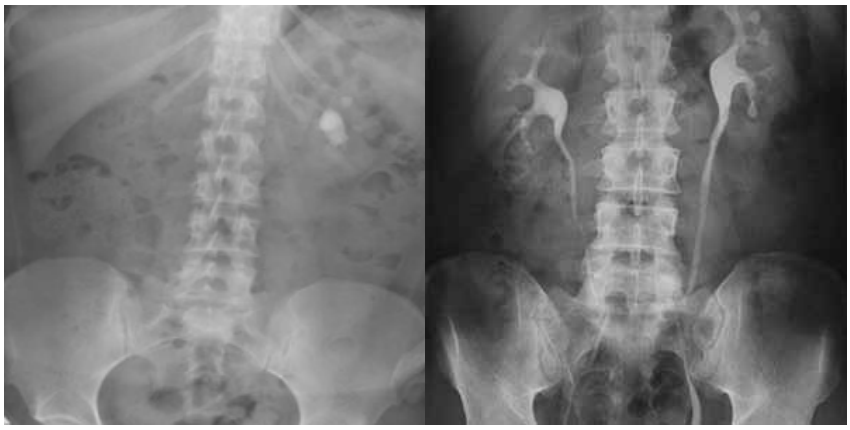

Figure 1. X ray image of left kidney stone (native, standing position) and IVU radiograph

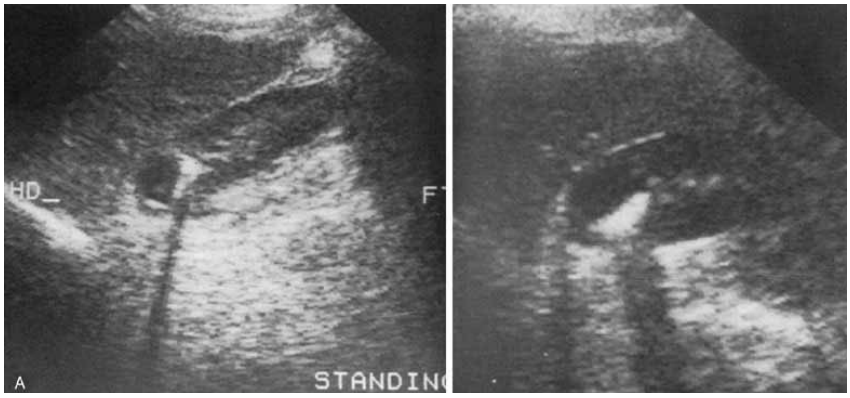

Figure 2. Ultrasound scan of kidney stone, (sitting and standing position)

may be seen in the urine as well. Serum chemistries and stone analysis remains the gold standard for determining the type of stone involved. Imaging is the cornerstone of an accurate diagnosis in a patient with renal colic (8, 9). Kidney, ureter, and bladder radiography is simple, inexpensive, and readily available. Sensitivity and specificity are limited by radiolucent uric acid stones, interference from bony structures, relatively inferior contrast resolution, and operator skills. More than 60% of calculi (calcium, struvite, and cystine) are radiopaque and demonstrable on plane abdominal radiography. Ultrasonography is useful for evaluating pregnant women and patients with contrast allergy. It can detect urinary tract obstruction and readiolucent stones, as well as assess renal architecture, size, and echogenicity (Figure 2.). Ultrasound scanning is highly sensitive for hydronephrosis, but it cannot detect small stones or ureteral stones. (sensitivity was only 21%).(10) Although massive hydronephrosis is easy to detect, subtle degrees may easily be missed. Intravenous pyelography (IVP) was long considered the preferred investigative procedure for the diagnosis of urolithiasis (Figure1). IVP can identify the location, size, shape, and number of stones and provide information about the functional status of the kidney. It is highly sensitive and specific for obstructive uropathy. Limitations to its use include contrast allergy, cost, inadequate bowel preparation, renal failure, and the presence of ureteric stones. Noncontrast Computer tomography CT has now replaced IVP in the workup of renal colic and the diagnosis of nephrolithiasis and, where available, is considered the modality of choice (Figure 3.). Noncontrast CT has a sensitivity of 95% and a specificity of 98%, it is 97% accurate for diagnosing stone disease.(11) It is superior to IVP in identifying ureteral stones and as good as IVP in determining the presence or absence of ureteric obstruction.

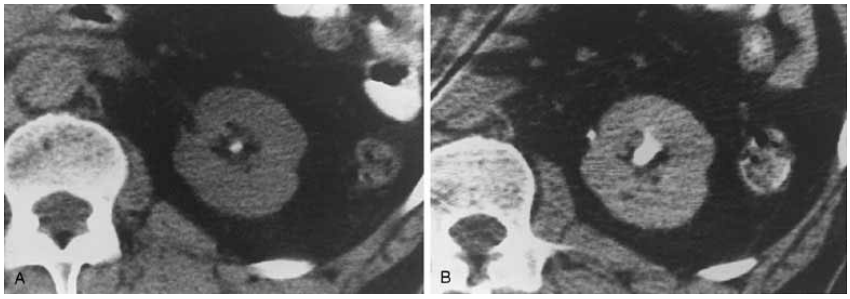

Figure 3. CT scan, view the stone in the kidney medulla

2. MATERIALS AND METHODS

This work analyzes all outpatients and all hospitalized patients with renal colic at the Urology Clinic Clinical Center Sarajevo. Testing includes the 1829 patients of both sexes from 15 years upwards (Table 1). The study is retrospective, clinical and manipulative, the descriptive-analytical starting from the 1st January 2007 and ending on the 31st December 2007. For each patient, hospitalized at the Urology Clinic KCU Sarajevo or recorded in the existing ambulatory protocols, the defined data were processed. The results are presented numerically in tables and graphs. Statistical analysis were performed on PC in MS Excel applying appropriate statistical methods. The data were processed showing the absolute values, calculating the percentage values, arithmetic middles with obligatory calculation of the standard deviation (Figure 4).

3. RESULTS

At the Urology Clinic Clinical Center Sarajevo, in the period from 1.1.2007 until the 1.1.2008, the study included 21.606 patients in the form of the first examination, control examination or infirmary interventions. Of that number, for the 1829 patients the renal

Population groups	Right side colic	Left side colic	Bilateral colic	Colic without defined side	Pregnant with left side colic	Pregnant with right side colic	Pregnant without defined colic	Total
15-35	239	208	20	138	8	6	4	623
35-55	289	273	26	229	0	0	0	817
55-	136	116	74	63	0	0	0	389
total	664	597	120	430	8	6	4	1829

Table 1. Populations groups and side of colic

Total number of patients with renal colic	Numebr of patients treated with conservative therapy		Number of patients treated with hospital therapy	
1829	1666	91.09%	163	8.91%

Table 2. Numebr of patients treated with hospital or conservative therapy

	Catheter and stent	ESWL
Right side colic	60	30
Left side colic	42	27

Table 3. Number of patient treated with ESWL of stent placement

Ureter	Ambulance (220)	Clinic	
		Right-sided	Left-sided
Lumbal part	87	37	15
Sacral part	82	22	19
Pelvic part	51	10	11

Table 4. Number of patient treated with different ureteral localization

colic was diagnosed and treated, which is the percentage of 8.47%. The table 1. and shows the ratio of the total number of examined patients and patients diagnosed with renal colic in the year 2007.

4. DISCUSSION

At the Urology Clinical Centre Sarajevo, in the period from 1.1.2007 until the 1.1.2008, 21606 patients were admitted for the doctoral examination. Out of this number, 1829 patients were treated under the diagnosis of renal colic, which represents 8.47% of the total number of admitted patients. The frequency of renal colic in urological diseases are approximately 10%, so we can say that in 2007 we could record slight decrease. The sex structure of men is represented with 56.26% while women are present with 43.74% (Figure 4). Numerically it was 1029 male and 800 female patients. We can say that the ratio of male and female is as much as 5: 4, or that men are 1.2 times more likely to suffer from colic. Patients were divided into three age groups. Each group had a range of 20 years. The first group included all patients from 15 to 35 years; the secondgroup included all patients from 35 to 55 years and the third group starting from age of 55 and older. Most of the patients belonged to the second group, i.e. patients in age range 35-55 years which was 817 patients or 44.67%. The first group was the second largest, and it consisted of 623 patients or 34.06%. The third group had 389 patients or 21.27%, and ranks third in terms of numbers of patients.

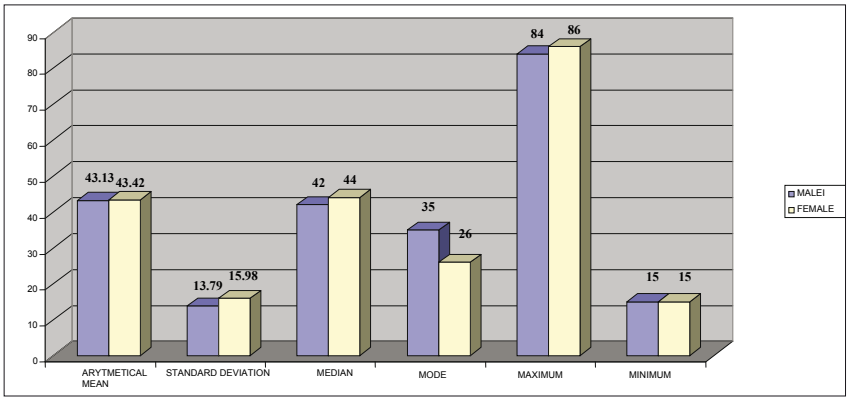

Figure 4. Number of patients with gender structure shows the average age of the population

Gender structure in the second group (35-55 yr.–817 patients) the most numerous group had following results: there were 497 men and 320 women. The first group (15 to 35 years-623 patients) had 336 male and 287 female patients. The third group (from 55 years and older -389 Patients) had 196 male and 193 female patients. Out of 1829 patients who had been diagnosed as patients with renal colic, 664 of them had a right sided renal colic, or 36.30%, while 597 patients or 32, 64% had left sided renal colic, while 120 patients had two sided, meaning 6 ,56%, and for the 430 patients or 23.51% side was not defined. A special group of patients consisted of pregnant women who were 18 and represented 1.01% of total patients. Location of renal colic for the pregnant women is as following: right sided colic was 4 or 22.22%, left sided colic was 8 or 44.44%, there were none two sided colic and how, and the number of colic without defined side was 6 or 33.33%. The highest incidence was recorded for the population aged 35-55 years, where the results were 817 colic or 44.66%. Out of that number 289 were right sided, 273 left sided, 20 two-sided, and 138 without defined side. In the first group aged 15-35, results were as following: right sided 239 patients, left sided 208, 20 patients had two sided, and for 138 patients side was not defined. In the third group, 136 patients had colic at the right side, 116 on the left side, 74 patients on both sides and 63 patients without a certain side. For the male patients the most present was right sided colic, counting 395 patients or 21.6%. Within the male population, the youngest patient was 15 years old and had a colic at the left side while the oldest patient was 84 years old and had a colic at the right side. The average age of patients was 43.13 years with a standard deviation of 13.79. Median was 42, a mod was that the majority of patients had 35 years. For the women right sided renal colic is most common, i.e. 269 patients or 14.7%. The young-

est patient was 15 years old, the oldest 86 years. Oldest and youngest patients have had renal colic on the right side. The average age of patients was 43.42 with a standard deviation of 15.97. Median was 44 and the 26th mode. Considering the average age, 43.13 for males and 43.42 years for females, it can be concluded to fit into the largest and the most exposed population group (35-55 years.). Prevalence of right sided renal colic compared to the left is also visible in all population groups. The results of study has shown that from 1829 patients who were treated by conservative therapy (spazmoanalgesics, large amounts of fluid, anti-vomiting, local application of heat and desirable physical activity) in 1666 sent them home with recommended therapy (hydration, drug therapy, diet) (12, 13, 14). The remaining 163 patients were admitted to hospital for further treatment (Table 3). Of this number 90 patients with right side and 73 patients with left side were treated. Catheterization and stent placement was performed in 60 patients with right renal colic, and at patients with left side colic this number was 42. Out of these patients, ESWL method was performed on 30 patients with right side and on 27 patients with left side (Table 3). There was no open surgery treatment indicated. In the therapy there were used DiclophenacNa(im) or Metamizole(iv) (15, 16, 17) Diagnostic methods have shown different locations of stones in the urinary tract. At ambulatory conditions, there were treated 220 renal colic due to ureteral obstructions with this localisations: 87 as a result of obstruction of the lumbal part of ureter, 82 sacral part of ureter and 51 as obstruction of the pelvic part of ureter (Table 4). At the clinic 37 patients have been treated with lumbal part obstruction, 22 patients with sacral part obstruction and 10 patients with pelvic part obstruction. All patients were with right colic (Table.4). The following localization of ureteral obstruction on the left side was: 15 patients with obstruction in the lumbar part, 19 with obstruction in the sacral part and 11 from the stones in the pelvic part.

5. CONCLUSION

Renal colic occurs in all age groups and in percentage, accounts for about 10% of all urological diseases. The disease is most common in the age range from the 35-55 years. Men's population gets 1.2 times more frequently than women and the right side is more common than the left. Most of the patients can be treated in outpatient clinics, conservative therapy and a small number of cases require hospitalization.

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