

Frequency of uro-sepsis in patients undergoing ureteroscopy for ureteric stones

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Abstract

Introduction: Urinary stone disease is very common in Pakistan. Most of cases of stone diseases are ureteric stones. Different types of management are available for ureteric stones to dealt with a uretero-lithotomy (open/laparoscopic), extracorporeal shockwave lithotripsy, uretero-scopy with stone fragmentation. In comparison to other modalities, uretero-scopy with stone fragmentation is a well established treatment with better success statistics and decreased number of undesirable events for patients who are being treated for renal calculus disease. It is hoped that this study may help in recognizing better modality of treatment with increased satisfaction of patients and treating doctors and thus can reduce financial burden in terms of decreased hospital stay and unnecessary use of antibiotics and resources.

Objective: To determine the frequency of uro-sepsis during early post-operative period of ureter-oscropy in patients being treated for ureteric calculus disease.

Setting: Department of Urology, Institute of Kidney Diseases Hayatabad Peshawar.

Study design: Descriptive case series

Duration: Six months 26th October, 2018 to 26th April, 2019.

Material and Methods: In present study total number of patients were 293. Uretero-scopy and stone fragmentation was performed by senior registrar and above. Patients were called for follow up on 1st, 2nd and 4th weeks and final calculations were made at the end of 4th week. Base line investigations such as full blood count, renal function test, Urine analysis, Urine culture were performed pre and post-operatively. All the data was collected using specially prepared proforma.

Results: In this study research article mean age was calculated to be 38-years with SD+12.59. Total number of male gender was 62% and female patients ratio was 38%. Moreover 22% patients had uro-sepsis while 78% patients were urosepsis free.

Conclusion: This research article concluded that the incidence of urosepsis during early post-operative period of uretero-scopy was 22% in patients being treated for ureteral calculus disease.

Keywords: uro-sepsis, uretero-scopy, ureteral stone disease, extracorporeal shockwave lithotripsy.

Introduction:

Urinary stone disease is very common in Pakistan. Most of cases of stone diseases are ureteric stones. Different types of management are available to deal with ureteric stones as uretero-lithotomy (open/laparoscopic), extracorporeal shockwave lithotripsy, uretero-scopy with stone

fragmentation.¹ In comparison to other modalities, uretero-scopy with stone fragmentation is a well established treatment with increased treatment success rates and reduced number of complications for those being treated for calculus disease.²⁻⁵

Complications can happen with any procedure,

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but complication rates reported with ureteroscopy are relatively low, approximately 3.5%.⁶ Frequently encountered complications are mucosal or complete ureteric tear, post-procedure pyrexia, urinary tract infections, urinary hemorrhage, strictures involving ureters and urethra and vesico-ureteric reflux disease. Ureteric avulsion is most dread-full complication and is rare.

Infection and uro-sepsis are recognized complications of uretero-scopy with significant morbidity and mortality.⁷⁻⁹ In adults urinary tract sepsis is most common i.e. 25 to 30% of all cases of sepsis in in early post-operative phase.² Post-ureteroscopic urosepsis is associated with patient, stone, infective and surgical factors. Percentage of uro-sepsis in different literature is demonstrated as 1% to 1.3%,⁶ and 7.0 % to 7.4%.^{2,8}

Uretero-scopy is one of frequently performed procedures in urology units for ureteric stone removal and post-ureteroscopy patients present frequently with uro-sepsis in our settings. The main objective and core theme of this study is to find out the frequency of uro-sepsis in post-uretero-scopy patients in institute of kidney diseases Hayatabad Peshawar. It is hoped that this study will help in establishing better modality of treatment for patients with ureteric calculus disease and hence will promote better satisfaction for patients and treating surgeons. This will help to reduce financial burden in terms of decreased hospital stay and decreased use of antibiotics and other resources. This study can be used for further research for uro-sepsis risk stratification.

Our objective is to determine the frequency of uro-sepsis during early post-operative period of uretero-scopy in patients being treated for ureteral calculus disease.

The operational definition of uro-sepsis is a post-uretero-scopy patient if he or she has suspected (>10 pus cells in urine examination) or confirmed urinary tract infection (positive urine culture) along with two or more of followings:

- Tachycardia (cardiac rate >90 beats per minute)

- Body temperature >38 C or <36 C
- Tachypnea with respiratory rate > 20 breaths per minute
- Leukocyte count >12*10³ or < 4*10³. In the early post-operative period i.e. within 4-weeks post-operative period from 1st day of ureteroscopy.

Material and Methods:

The study is carried out in the Department of Urology, Institute of Kidney diseases Hayatabad Peshawar. This is a descriptive case series study carried out 26th October 2018 to 26th April, 2019 (6 months)

Our sample size was 293-patients, confidence interval 95%, anticipated frequency of uro-sepsis 7.0%, Significance level 3%. Our sampling technique non-probability, consecutive sampling

Following criteria was used for collection of samples

Our inclusion criteria was patients age 18 to 60 years, both genders, single ureteric calculus, size of calculus 0.6cm to 1.5cm, patients with pre-operative negative urine culture for micro-organisms.

Our exclusion criteria was patients with diabetes on the basis of history, Immunocompromized patients i.e. with organ transplantation, receiving chemotherapy, using corticosteroid treatment for any reason and AIDS on the basis of history, Bilateral ureteric stone disease, Post-uretero-scopy duration more than 4 weeks.

Prior submission was taken on Ethical committee Ayub Teaching Hospital, Abbotabad. The research procedure was started in Urology department Institute of Kidney Diseases (IKD), HMC Peshawar. Patient seen in Urology OPD of IKD and fulfilling the inclusion criteria was recruited for the study. Informed consent was taken from all included patients. Their detailed history (name, age, gender, address, contact number, diabetes, and immunosuppression) and the physical examination of the patient were re-

Table 1: Stratification of urosepsis with variable age (n=293)

Urosepsis	18-30 years	31-45 years	46-60 years	Total
Yes	21	28	15	64
No	73	54	102	229
Total	94	82	117	293

P value was calculated as 0.0016 using chi square test

Table 2: Stratification of urosepsis with respect to gender distribution (n=293)

Urosepsis	Male	Female	Total
Yes	40	24	64
No	142	87	229
Total	182	111	293

P value was calculated as 0.9429 using chi square test

Table 3: stratification of urosepsis with respect to stone size (n=293)

Urosepsis	≤ 1 cm	> 1cm	Total
Yes	27	37	64
No	96	133	229
Total	123	170	293

P value was calculated as 0.9695 using chi square test

Table 4: Stratification of urosepsis with respect to location of stone (n=293)

Urosepsis	Distal ureter	Middle ureter	Proximal ureter	Total
Yes	20	18	26	64
No	74	64	91	229
Total	94	82	117	293

P value was calculated as 0.9861 using chi square test

Table 5: Stratification of urosepsis w.r.t post-operative period (n=293)

Urosepsis	<3 weeks	≥3 weeks	Total
Yes	42	22	64
No	148	81	229
Total	190	103	293

P value was calculated as 0.8826 using chi square test

corded. Uretero-scopy and stone fragmentation was performed by senior registrar and above. Patients were called for follow up on 1st, 2nd and 4th weeks and final analysis was carried out after completion of 4th week. Base line investigations such as FBC, RFTs, Urine analysis, Urine culture were performed pre and post-operatively. All the data was collected using pre-designed proforma.

Data analysis was performed using SPSS version 21. Quantitative variables like total leucocyte count, age, heart rate, stone size, temperature, post-op-day was described as mean±standard deviation. Categorical variables like gender and outcome variables i.e. uro-sepsis was described as frequencies in percentages. Uro-sepsis was

stratified by age, gender, location of stone, post-op period and stone size. To know significant difference while considering age as variable, chi square test was used at 5% significance level.

Results

In present thesis, distribution for age was statistically counted as 97(33%) patients were in age group 18-30 years, 126(43%) patients in the age group 31-45 and 70(24%) in age group 46-60. Calculation for mean age turned out to be 38-years with SD+12.59.

Stones disease involved more male patients 182(62%) as compared to female patients i.e. 111(38%). It is evident that males are more prone to calculus disease.

Stone size was analyzed as 123(42%) patients were having stone ≤ 1cm in size while 170(58%) patients were having stone >1cm in size. Mean stone size was 1cm with SD+0.271.

Location of stone was analyzed as 94(32%) patients had stone located at distal ureter, 82(28%) patients had stone located at middle ureter, 117(40%) patients had stone located at proximal ureter .

Mean heart rate 90 beats/minute with SD± 2.26, mean temperature 38C with SD ± 5.71 and mean TLC was 13*211with SD±11.93.

Post-operative period was analyzed as 190(65%) patients had post-operative period < 3-weeks while 103(35%) patients had post-operative period ≥3 weeks. Mean post-operative period was 3-weeks with SD+.28.

Uro-sepsis was calculated to be found as 64(22%) patients while 229(78%) patients had no sepsis was 229(78%).

Stratification of uro-sepsis while considering age, male or female gender, size of stone and location of stone as variables has been depicted in table No.I,II ,III, IV and V respectively.

Discussion

Calculus disease is very common in Pakistan af-

fecting different parts of urinary system i.e. kidneys, ureters, urinary bladder and urethra. Most of cases of stone diseases are ureteric stones. Different types of treatments are available for ureteric stones such as uretero-lithotomy (open/laposcopic), extra corporeal shockwave lithotripsy, uretero-scopy with stone fragmentation. In comparison to other modalities, uretero-scopy with stone fragmentation is a well established treatment which is more successful in clearing stones. Furthermore it is less hazardous in terms of post-operative complications.

After analyzing the data and thorough examination of result in present study, it was evident that majority of patients with stone disease were young and their mean age was found to be 38-years with SD+12.59. Greater majority of males (62%) victims of calculus disease as compared to female which were 38% of total patients studied. Moreover uro-sepsis affected 22% of total operated patients as compared to 78% patients who were not having any sort of sepsis.

Matching results were evident in a study conducted by Bloom J et al. in which a total number of 345-patients having ureteric calculus disease were subjected to uretero-scopy after completing all pre requisites. Among this large group of patients only 15 (4.3%) were treated for urosepsis after surgery.⁹ Decreased sepsis rates in this study may be due to accurate diagnosis and prompt treatment of any pre-operative infection of urinary tract. However sepsis caused additional financial burden by increasing duration of hospital stay by 5.33 ± 3.84 days per patient. When urine cultures were performed, three urine samples showed gram positive bacteria and in 5-samples, multi-drug resistant gram negative bacteria were found. In seven samples culture reports did not yield any organism. Pre-operatively 60% of patients received cefazolin antibiotic while others receive either gentamicin (48.5%) or ciprofloxacin (20%). It was found out that different factors were responsible for urosepsis. Recently treated urinary tract infection and previous history of endoscopic surgeries were associated with increased risk. Similarly

prolonged surgery and other associated illnesses were making patients vulnerable to sepsis. Anyhow, when statistical analysis was performed for different variables only recent history of treatment for urinary tract infection (last one month) was found significant with $p = 0.001$.

Similar findings were observed in other studies as uro-sepsis was reported in these patients and it was found out that post-operatively uro-sepsis is around 25 to 30% of all septic patients.¹⁰ Post-uretero-scopy. Uro-sepsis is associated with patient, stone, infective and surgical factors. Percentage of uro-sepsis in different literature is demonstrated as 1% to 1.3%, and 7.0 % to 7.4%.^{11,2}

Post-operative fever occurred in 6.4% in our study which was higher than what mentioned in another study in which a very decreased rate of 1.1% was found which may be due to more pre cautionary measures adopted by them or may be their patients were pre-operatively infection free.¹³ Another research article revealed decreased rate of uro-sepsis i.e. of 0.8%.¹⁴ Öğreden et al. reported the incidence of 10.2%.¹⁵ Shresthareporedt a 45% incidence in his study which is higher than what is found in this study.¹¹

Conclusion:

Our study concludes that the frequency of uro-sepsis during early post-operative period of uretero-scopy was 22% in patients who were treated for ureteral calculus disease. More aseptic pre cautions are required to decrease incidence of uro-sepsis. Pre-operative urine culture and treatment guided by its results will further help to reduce rate of uro-sepsis.

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Role and contribution of authors:

Dr Javed Iqbal Khan, conceived the idea, helped in preparing proforma and reviewed the literature and made final changes.

Dr Shabeena Naz, collected data, did the initial

write up and found out references.

Dr Tahir Iqbal Khan, helped in providing radiological services to patients and helped in writing discussion.

Dr Attique Afzal Malik, helped in writing discussion and collection of references

Dr Mehwish Naz, helped in collection of data, references and writing of introduction

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