

Four decades of urolithiasis: What has changed in our practice?

Manzoor Hussain, Saeed Abidi

Urolithiasis is the most common urologic disease in Pakistan, which is treated and managed by urologists throughout their careers.¹ Its exact prevalence and incidence has never been investigated in the country, but a few rough estimates show the disease prevalence to be 9-15%.² The oldest study on urolithiasis on 400 patients, was published in 1975, which showed predominantly bladder stone disease accounting for 60% of all cases.³ After the first publication, about 35 papers have been published on this subject from Sindh Institute of Urology and Transplantation (SIUT), Karachi, Pakistan. SIUT is a major tertiary care urology and nephrology center with a catchment area extending to almost the entire country.

In this resume the subject of stone disease from 1971 onwards will be presented to note the changes in its epidemiology and management. Collectively, 83,107 adult stone patients were treated during the above period. The number of stone patients has increased enormously from 2,345 between 1971-1982 to 8,905 during 1983-1993, and 27,541 during 1994-2004 period. Finally, during the years, 2005-2014, 45,318 patients were managed.⁴ This tremendous increase in the number of patients could be attributed to increasing free facilities of minimally invasive surgery including Extracorporeal shock wave lithotripsy (ESWL), Percutaneous Nephrolithotomy (PCNL) and Ureteroscopy (URS) at this institute, availability of ultrasound at tehsil and district level hospitals, or due to increasing incidence and prevalence of stone disease in the country.

Similarly, if the peak age and gender differences at different periods in the four decades are studied, then it can be seen that from 1972-1974, the peak age was 21-40 years with M:F ratio of 4.5:1.3, in 1987-1990, it was 31-40 years with M:F ratio 4.1:1, in 1991-1993, it was 21-30 years with M:F ratio of 4.8:1, in 2001-2004, it was 31-40 years with M:F ratio of 1.7:1.4

The analysis of the patients with stone disease visiting the Emergency Room services of SIUT in 2015 shows the peak age as 31-40 years with M:F ratio of 1.4:1. This data shows that over the years the gender gap has been narrowed while the peak age of stones presentation remained the

same during all four decades and beyond.⁴

The reason for this narrow gender gap could be due to socioeconomic independence, high protein diet and more female patients seeking urologic treatment than in the past. However, the peak age remained the same during all four decades. i.e. 30-40 years, as compared to other studies from the west which reported a peak age in more elderly population.⁵ It is also important to note that stone disease in children is increasing in Pakistan. The trends in paediatric population with stone disease, observed during 1998-2015 was a figure of 10,687 (62%) out of total 17,228 paediatric urology patients.⁶

Occupation of a person could be the risk factor for stone formation because of exposure to heat and loss of body fluids via sweating. On analysing the occupation of stone patients, the commonest occupation was farmers (23%), labourers (19.7%), housewives (14.2%), drivers (10.4%), chefs (9.09%) and welders (7.4%). Interestingly, 165 (16.21%) patients were office workers, businessmen, shopkeepers, teachers, policemen, doctors, armed forces, landlords and contractors. This data clearly shows that an occupation which exposes people to high environmental temperature is an etiological factor for stone disease. This is also evident from the observation of higher reporting rate of stone patients during summer than in winter months in our stone clinic and emergency.

Renal failure was the presenting symptom in 28% patients in the period 1986-1990. That figure declined to 10% during period 1991-2007 and remained stable at 10.7% till 2010.⁷

Although this data shows that ESRD secondary to renal stone disease remains stable at around 10% but hopes are being raised that because of early intervention by minimally invasive technologies in stone management and better urology patient care, this complication will further decrease in the future.

The diagnosis of stone disease during 1970s was done by plain X-ray abdomen and X-ray IVP and cystoscopy retrograde study. In 1980s, ultrasound was added to the diagnostic armamentarium. During 2010, computed tomography KUB was made available and since 2015, 64-slice CT scans and CT urogram have been included to the diagnostics.

.....
Sindh Institute of Urology and Transplantation (SIUT), Karachi, Pakistan.

Correspondence: Manzoor Hussain. Email: hmanzoor2015@gmail.com

DOI: <https://doi.org/10.47391/JPMA.22-25>

The management trends, in four decades have also changed. During the period 1972-1982, open surgeries and litholapaxy were the mainstay. In the second decade (1983-1993), open surgery, ESWL, URS, litholapaxy and combined procedures were used. From 1994-2004, PCNL was added to the above procedures, while in the fourth decade (2005-2014), although the number of stone patients increased to a figure of 46,316, from 1,654 in the period 1972-1982, but procedures to remove stones were the same as in the third decade. There are no publications on micro PCNL or endoscopic combined intra renal surgery (ECIRS) from Pakistan. The management in the fourth decade therefore showed 46% patients being treated by ESWL, a non-invasive method. It was observed that on the international screen ESWL was a disappearing technology due to less efficacy in stone free rates and declining interest of urologists in its use.

During the 2020 COVID-19 period, a total of 4,376 adult stone patients were treated at SIUT Karachi, out of which 2,518 (57.5%) were subjected to ESWL, 859 (19.6%) to URS and 362 (8.2%) to PCNL. ESWL was used during this period to take care of stone patients as there was minimal exposure of staff and patients to viral aerosols. Adopting the COVID protocol, we treated almost the same number of patients for stone management as in the period before COVID. Only two patients developed COVID symptoms postoperatively.

Newer modalities on stone management are flexible ureteroscopy, mini-PCNL, micro-PCNL, Endoscopic Combined IntraRenal Surgery (ECIRS) and Robotic-assisted pyelolithotomy. These methods are still slow to uptake. Only one study has been published on robotic-assisted pyelonephrolithotomy⁸ and one has been published regarding the use of flexible ureteroscopy.⁹ Two centers have started laparoscopic uretrolithotomy and pyelolithotomy in Karachi, Pakistan.

Although, in the last four decades the epidemiology and management of urolithiasis has changed considerably from open surgery to ESWL, PCNL and URS, but the number of stone patients coming to public and private sector hospitals has increased many folds. The future sees a rise in the new cases of stone disease presumably due to global warming, change in diet from vegetables and fruits to meat, salt, and acid foods and easy availability of ultrasound for diagnosis. Lack of clean water, sweating due to heat exposure, excessive use of vitamin C and D supplements, calcium and injudicious use of antibiotics are increasingly resulting in more stone cases. More work is required on the aspect of epidemiology, causes and prevention of stone disease. This could be achieved by opening new specialized stone clinics in the country and creating public awareness about symptoms, diagnosis and treatment of stone disease through the electronic, social and print media. Evidence-based research has become a necessity more so on prevention of this common and chronic disease in urology.

References

1. Hussain M. Evolution of Urology Services in Pakistan. *J Coll Physicians Surg Pak* 2021; 31:746-748.
2. Hussain M. Enormity of urolithiasis in Sindh province. *J Pak Med Assoc.* 2014; 64:1337-8.3.
3. Rizvi SA. Calculous disease--a survey of 400 patients. *J Pak Med Assoc.* 1975; 25:268-74.
4. Hussain M, Rizvi SAH, Lal M, Askari H, Hashmi A, et al. Four decades of stone disease at SIUT: Pakistan. *Proceedings: SIUT international symposium* 2015.
5. Sorokin I, Mamoulakis C, Miyazawa K, Rodgers A, Talati J, Lotan Y. Epidemiology of stone disease across the world. *World J Urol.* 2017; 35:1301-20.
6. Sultan S. Evolution of pediatric urology at Sindh institute of urology and transplantation. *Front Pediatr.* 2014; 2:88.
7. Hussain M, Hashmi AH, Rizvi SA. Problems and prospects of neglected renal calculi in Pakistan. *Urol J* 2013; 10:848-55.
8. Hussain M. Past Present and future of urology in Pakistan. *J Pak Med Assoc.* 2021;71: 2407-2414.
9. Ather MH, Sulaiman MN. Flexible ureteroscopy versus miniaturized percutaneous nephrolithotomy for renal stones of 1-2 cm. *Faculty Reviews.* 2020; 9:29.