

Admission Patterns and Management of Urolithiasis: A Hospital Based Study in Tikur Anbessa Specialized Hospital (TASH), Addis Ababa, Ethiopia.

D. Andualem, G. Gidena

Addis Ababa University, School of Medicine, Department of Surgery

Correspondence to: Dr. D. Andualem, Email: andualemdb94@yahoo.com

Background: The prevalence of urolithiasis in black Africans is considered to be lower than other parts of the world. A study in Nigeria found a prevalence of 6.3 per 100000 populations, with a male to female ratio of 4:1¹⁰. Ethiopia is a tropical sub-Saharan African country with close proximity to the Afro-Asian stone belt. Therefore, this is a hospital based study that tries to look in to the epidemiology and management of urolithiasis.

Methods: This is a one year cross-sectional study of urolithiasis patients admitted in TAGSH from January 1st to December 31st 2013. Data was collected using a preset questionnaire from medical records, laboratory and imaging investigations.

Results: The number of patients with urolithiasis admitted to the urology ward in the study period (Jan. 2012 to Dec. 2013) was 84, which is 22.3% of the 376 urology patients admitted. Of these, 58(69%) were males and 26(31%) females. During the study period 46 (55%) patients were treated with open surgical procedure, 35 (42%) were treated endoscopically and 3 (3%) both by open and endoscopy.

Discussion: This study shows that urolithiasis is one of the major reasons for urologic admissions in TASH which contrary to some sub-Saharan African countries¹⁰. Our study also showed renal failure is a major complication of urolithiasis patients which may indicate late admission or poor medical facility. Most patients are treated by open surgery in our hospital which is against from the developed countries where only less than 5% of patients are treated by open method.

Conclusion: Urolithiasis is a major cause of urologic admissions in our hospital and the treatment modalities offered are not up to the standard.

Introduction

Different archeological findings and writings about painful stone colic and therapeutic trials for stone removal show kidney stone disease is well known for centuries. In addition, examination of Egyptian mummies revealed kidney and bladder stone disease¹. Prevalence of urinary calculi is estimated to be 1-5% worldwide, 2-13% in developed countries and 0.5-1% in developing countries²⁻⁴. Although the cause is not clear, the prevalence and incidence of kidney stone disease is increasing throughout the world. However, the usual causes for kidney stone formation are genetic and environment⁵⁻⁷. The commonly associated environmental factors are diet, climate and occupation⁸.

The risk of developing urolithiasis in adults appears to be higher in western hemisphere than eastern hemisphere, although the highest risks have been reported in some Asian countries such as Saudi Arabia¹. Countries in the Afro-Asian stone belt (stretching from Egypt and Sudan, through the Middle East, India, Pakistan, Burma, Thailand, Indonesia and the Philippines) falling within the tropical and subtropical regions have consistently reported a high incidence of urolithiasis⁹.

The prevalence of urolithiasis in black African is considered to be lower than other parts of the world. A study in Nigeria found a prevalence of 6.3 per 100000 population, with a male to female ratio of 4:1¹⁰. Ethiopia is a tropical sub-Saharan African country with close proximity to the Afro-Asian stone belt. Therefore, this is a hospital based study that tries to look in to the admission patterns and management of urolithiasis in TASH which is a teaching and referral hospital.

The objective of the study is to describe the admission patterns of urolithiasis at TASH in terms of gender, occupation and residential localities. In addition it also tries to look in to the management options and their outcomes.

Materials and Methods

This is a one year cross-sectional study of urolithiasis patients admitted in TASH from January 1st to December 31st 2013. Data was collected using a preset questionnaire from medical records, laboratory and imaging investigations. The data includes demography, and imaging results (Ultrasound, Plain abdominal film and intravenous urography), operative findings and treatment outcomes. The data was analyzed using a statistical soft ware SPSS version 16.0.

Results

The number of patients with urolithiasis admitted to the urology ward in the study period (Jan. 2012 to Dec. 2013) was 84, which is 22.3% of the 376 urology patients admitted. Of these, 58(69%) were males and 26(31%) females. The age range was 16-74 years. The age groups commonly affected were 25-34 years and 35-44 years with 31% (26) and 22% (22), respectively. Nearly 79% (76) of the patients are under the age of 45 years (Table 1).

Twenty nine (35%) of the admitted patients were civil servants and majority (42%) of patients are from Addis Ababa followed by patients from Oromya (24%) and Amhara (19%) regions, respectively (Table 1).

Table 1. Sociodemographic Distribution of Patients Admitted to TASH in2013

Sociodemographics		Sex		
		Male	Female	Total
Age	15-24	10	8	18
	25-34	19	7	26
	35-	16	6	22
	45-54	5	3	8
	55-64	2	1	3
	>65	6	1	7
Occupation	Civil Servant	20	9	29
	Student	7	5	12
	Farmer	11	0	11
	Factory worker	9	1	10
	Merchant	5	4	9
	Military	2	0	2
	Other	4	7	11
Address	Addis ababa	22	13	35
	Oromya	16	4	20
	Amhara	10	6	16
	SNNP	4	2	6
	Tigray	3	1	4
	Diredawa	3	0	3

Forty one (48.8%) patients were admitted with diagnosis of renal stones followed by 33(39.3%) ureteric stones, 5(6.0%) bladder stones, 4(4.8%) renal and bladder stones and 1 (1.2%) renal and bladder stones, respectively (Table 2).

Of the 41 renal stones 49% were multiple stones, 29% were single stones and 22% were Staghorn stones respectively (Figure 1.) From the 37 patients with diagnosis of ureteric stone 40% were distal, 38% were mid ureteric and 21% were proximal stones.

Table 2. Anatomic Locations of Urolithiasis in Patients Admitted to TASH in 2013

	Frequency	Percent
Renal stone	41	48.8
Ureteric stone	33	39.3
Bladder stone	5	6.0
Renal and ureteric	4	4.8
Renal and bladder	1	1.2
Total	84	100.0

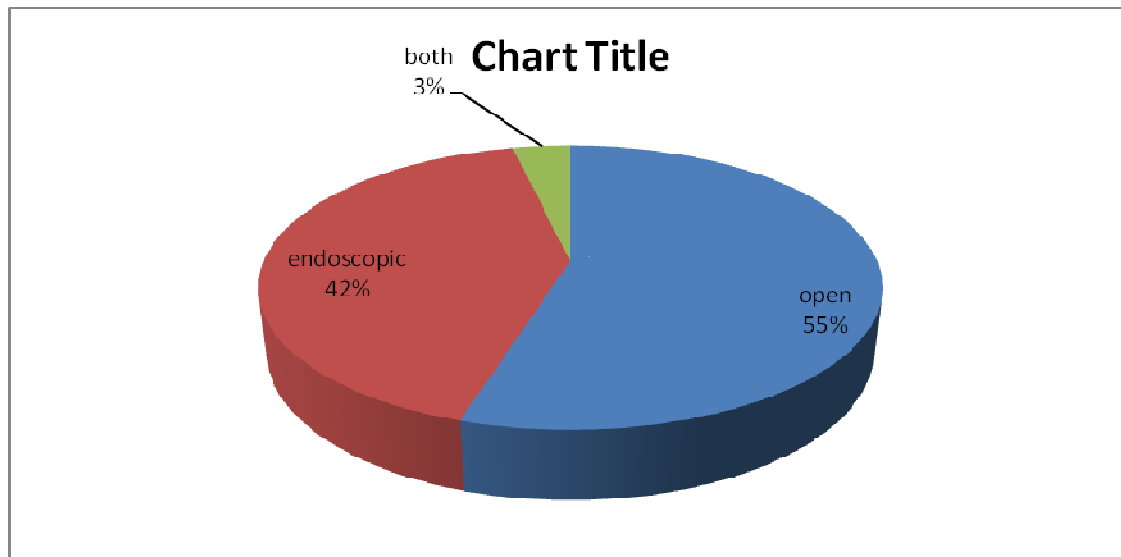


Figure 1. Types of Surgical treatment for urolithiasis patients admitted to TASH in 2013

The most common complication of stone diseases at presentation was hydronephrosis seen in 53(63%) of patients followed by renal failure 13(15%) and only 8(10%) of patients came with stone disease without complication (Figure 2). During the study period 46 (55%) patients were treated with open surgical procedure, 35 (42%) were treated endoscopically and 3 (3%) both by open and endoscopy. Of the open treated patients twenty one (43%) of patients were treated by pyelolithotomy and 13 (25.5%) of patients were treated by nephrolithotomy whereas 4(8%) ended up in nephrectomy (Figure 4). Of those treated endoscopically 30 (76%) underwent semi-rigid ureterorenoscopy and 7 percutaneous nephrolithotomy.

Complete stone clearance was achieved in 65 (77.4%) patients while 14 (16.7%) patients had partial stone clearance and 5 (6%) had no stone clearance. After surgery 59(70%) had smooth post operative course free of complications. The most common post operative complication was infection in 8 (9.5%) patients followed by 6(7.1%) stone migration, 5(6%) renal failure, 4(4.8%) prolonged urine leak and 2 (2.4) major bleeding respectively.

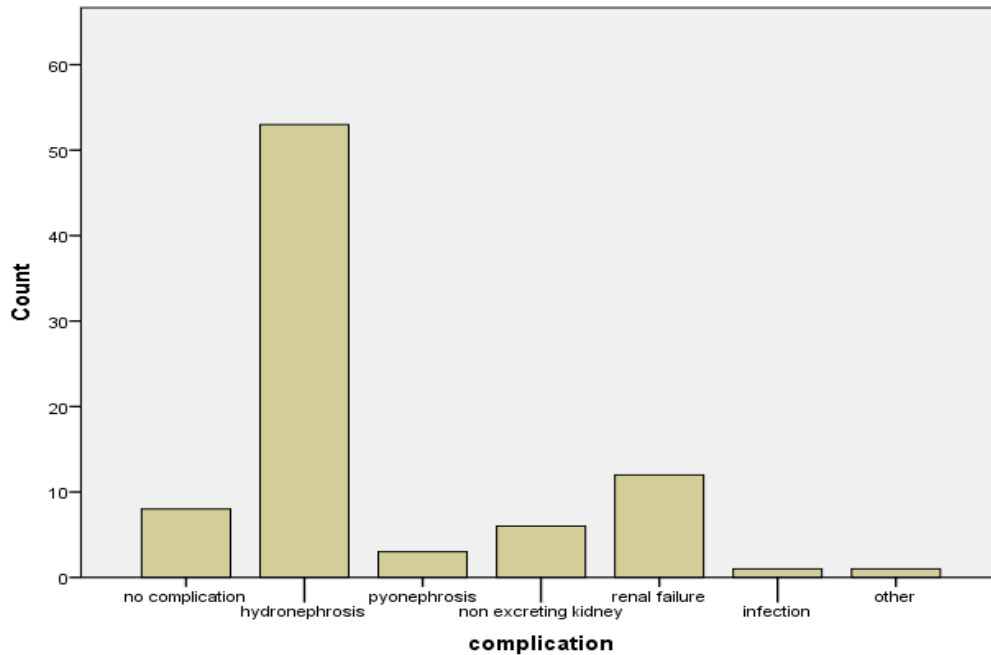


Figure 2. Complications of urolithiasis patients admitted to TASH in 2013

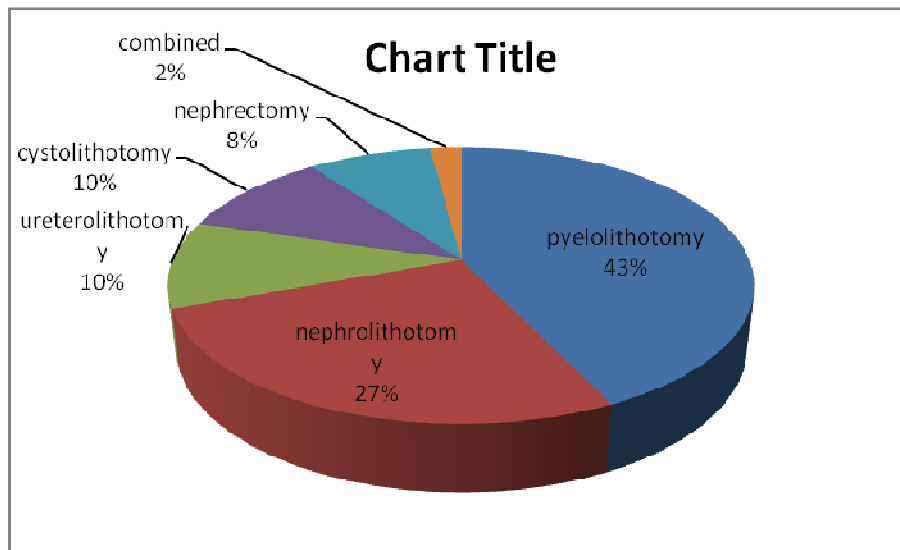


Figure 3. Types of Open Surgeries Performed for Urolithiasis Patients Admitted to TASH in 2013

This study shows that urolithiasis is one of the major reasons for urologic admissions in TASH accounting for 22.1 % which is in contrary to some sub-Saharan African countries¹⁰. The male to female ratio is about 2 to 1 which is different from community studies of 4 to 1 in Nigeria. Most patients are under the age of 45 which is the major productive force. Patients are admitted from every corner of the country though most patients are from Addis Ababa. Most admissions at TASH are for renal and ureteric stones with few bladder stones. The high percentage of Staghorn stones (22%) indicates that infection might be a significant cause of renal stones in our study.

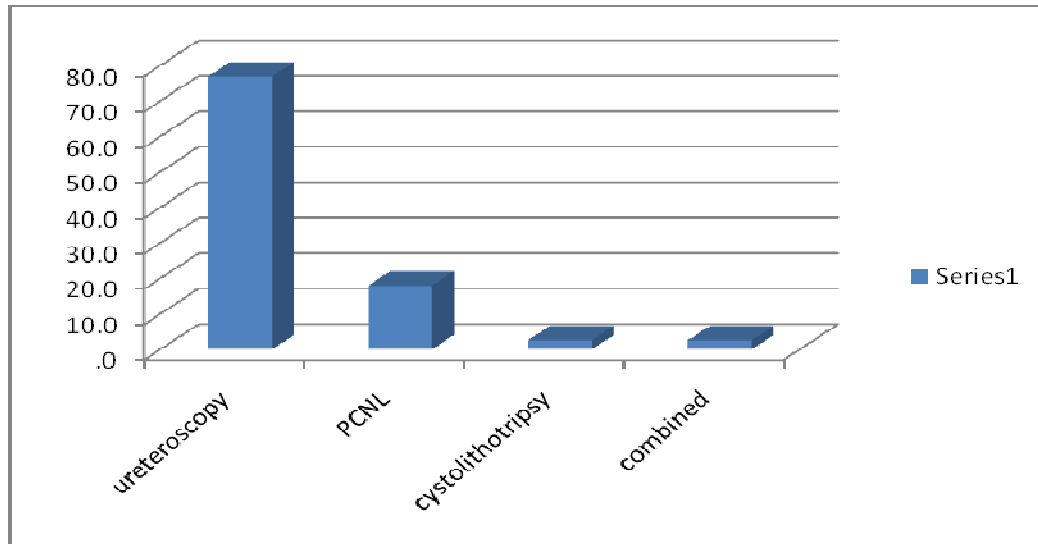


Figure 4. Types of endoscopic procedures performed for urolithiasis patients admitted to TASH in 2013

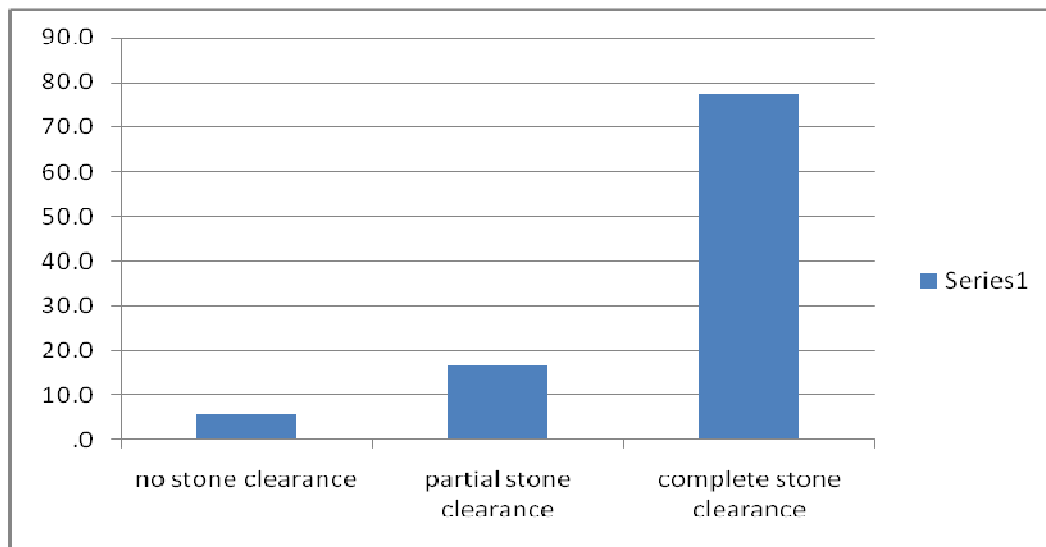


Figure 5. Percentage of stone clearance in urolithiasis patients admitted to TASH in 2013

Table 3. Post operative Complications of Urolithiasis Patients Admitted to TASH in 2013

Complications	Frequency	%
No complication	59	70.2
Bleeding	2	2.4
Infection	8	9.5
Prolonged urine leak	4	4.8
Renal failure	5	6.0
Stone migration	6	7.1
Total	84	100.0

Discussion

Our study also showed renal failure is a major complication of urolithiasis patients at TASH which may indicate late admission or poor medical facility. Most patients are treated by open surgery in our hospital which is against from the developed countries where only less than 5% of patients are treated by open method. The other important finding to note is 4 (8%) patients ended up in nephrectomy. Complete stone clearance is achieved only in 77% percent of patients whereas it reaches up to 98% in the developed countries even with endoscopic surgeries. Most patients had smooth post operative course whereas about 25 (30%) patients had different complications like infection prolonged urine leak etc.

Conclusion

Urolithiasis is a major cause of urologic admissions making one-fifth (20.1%) of all urologic admissions in our hospital and the treatment modalities offered are not up to the standard.

References

1. Michelle Lopez, History, epidemiology and regional diversities of urolithiasis. *Pediatric Nephrology*, 25: 49-59, 2010
2. A.A. Ketabchi, Prevalence of symptomatic urinary calculi in Kerman, Iran. *Urology journal*, 5(3), 2008.
3. M.A.H. Aly Freeg, A retrospective study of the seasonal pattern of urolithiasis. *Saudi journal of kidney diseases and transplantation*, 23(6):1232-1237, 2012.
4. N.S. Schenkman, Urolithiasis. *World journal of medicine, epitomes-urology*, 169(2), 1998.
5. Victoriano Romero, Kidney stones: A global picture of prevalence, incidence and associated risk factors. *Reviews in Urology*, 12(2-3):e86-e96, 2010.
6. E.H. Siddiqui, Urolithiasis: Presentation and ultrasonic evaluation. *Professional medical journal*, 18(3): 380-385, 2011
7. R.E. Abdel-Halim, Urolithiasis in adults: Clinical and biochemical aspects. *Saudi medical journal*, 26(5):705-713, 2005.
8. M.J. Thun, Urolithiasis in Tennessee: An occupational window in to a regional problem. *American journal of public health*, 81(5), 1991.
9. S.A.H. Rizvi, The management of stone disease. *BJU International*, 89(suppl.1): 62-68, 2002.
10. J.U.V. Monu, Pattern of urolithiasis in Benin City, Nigeria. *Journal of the national medical association*, 81(6): 695-698, 1989.