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Original Research Paper

Anatomy

INCIDENCE OF ASYMPTOMATIC RENAL STONES AMONG MEDICAL STUDENTS – AN ULTRASONOGRAPHIC SCREENING STUDY.

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ABSTRACT Stones may be clinically silent for a long time. However, when they grow beyond a size of spontaneous clearance through the urinary tract, they may cause infection, obstruction, permanent kidney damage, and finally loss of the kidney. Therefore, it would be most helpful to find stones in early stages of their growth, where they are not yet clinically symptomatic. An easy to use, harmless and accurate means for such a screening would be a renal ultrasound. So the purpose of this study is to figure out incidence of such asymptomatic renal stones among the medical student.

Subject and method: For this study, 30 students underwent an abdominal diagnostic ultrasound at the Dept. of Radiology of the SKIMS medical college and Hospital, students with known kidney or urinary stone diseases were excluded from the study.

Result: On pre-ultrasound assessment, none of the patients reported previous kidney or urinary stone disease. Yet, stones were discovered in 1 patient (3.3%) and were predominantly located in the left kidney.

Conclusions: Urinary stones have the potential for becoming clinically symptomatic and could lead to infection, obstruction, renal damage and, in the worst scenario, to the loss of a kidney. This, however, might be effectively prevented if potentially significant stones could be detected prior to the onset of symptoms and be treated appropriately.

KEYWORDS : Renal stones, Hydronephrosis.

Introduction: Kidney stone disease is when a solid piece of material (kidney stone) occurs in the urinary tract. The process of stone formation in kidney is called nephrolithiasis and in any part of urinary tract including kidney, urethra, ureter and urinary bladder is called Urolithiasis. The stones themselves are also called renal calculi. Nephrolithiasis is a multifactorial disease related to genetic disorders and environmental factors. Urolithiasis is a common disease with an increasing prevalence and incidence worldwide that appears even more prone in industrialized countries. Renal calculi are formed when the urine is supersaturated with salt and minerals such as calcium oxalate, struvite (ammonium magnesium phosphate), uric acid and cystine[1], 60-80% of stones contain calcium. They vary considerably in size from small 'gravel-like' stones to large staghorn calculi. The calculi may stay in the position in which they are formed, or migrate down the urinary tract, producing symptoms along the way. Studies suggest that the initial factor involved in the formation of a stone may be the presence of nanobacteria that form a calcium phosphate shell[2, 3]. Patients with renal calculi suffers from severe flank or back pain, nausea, vomiting, increased urinary frequency/urgency, blood in the urine, abdominal pain, painful urination or excessive urination at night. Sometimes testicle pain, groin pain or chills may also be observed.

Stone disease is a worldwide common problem with an enormous socio-economic impact[4]. That about 5% of American women and 12% of men develop kidney stones sometime in their There is a high prevalence of renal stones in the general population. It has been estimated life [5]. Stones may be clinically silent for a long time. However, when they grow beyond a size of spontaneous clearance through the urinary tract, they may cause infection, obstruction, permanent kidney damage, and finally loss of the kidney. Therefore, it would be most helpful to find stones in early stages of their growth, where they are not yet clinically symptomatic. An easy to use, harmless and accurate means for such a screening would be a renal ultrasound. However, to assess the cost effectiveness of such a screening, the expected incidence of silent stones to be detected by ultrasound screening has to be established first. Therefore, although factors such as changing diet and increasing prevalence of diabetes and obesity likely contribute to the observed epidemiologic trends, their relative effect on stone disease can only be assessed after accounting for increases in utilization of imaging modalities. The purpose of this study was to estimate the prevalence of asymptomatic stones and consider how this figure could affect prevalence data for renal stones that do not discriminate between symptomatic and asymptomatic stones.

Method: For this study, 30 students underwent an abdominal diagnostic ultrasound at the Dept. of Radiology of the SKIMS medical college and Hospital, students with known kidney or urinary stone diseases were excluded from the study. All ultrasounds were performed by one experienced radiologist to exclude inter-observer variation. Age, sex, any pathological finding and in particular of renal stones were recorded.

Result: of the total 30 subjects, 13 were females and 17 were females. The average age was 18-20 for all subjects. All subjects underwent renal ultrasound screening by one ultrasonographer. On pre-ultrasound assessment, none of the patients reported previous kidney or urinary stone disease. Yet, stones were discovered in 1 patient (3.3%) and were predominantly located in the left kidney(Fig 1).

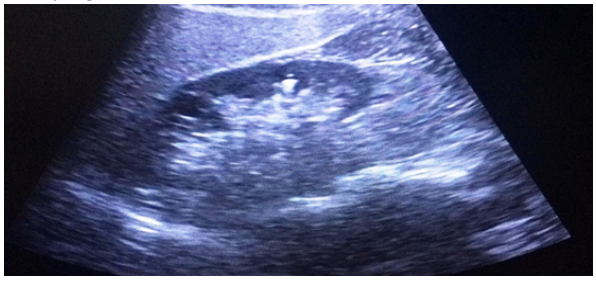

Fig. 1 ULTRASONOGRAPHIC IMAGE SHOWING LEFT RENAL STONE.

Discussion and conclusion: Urinary calculi are solid concretions found in the kidneys, ureters, urinary bladder and urethra. These stones are formed in the urinary tract from dissolved urinary minerals. Biochemical analysis reveals six varieties of renal calculi, of which 90% are radiopaque, mostly calcium oxalate and phosphate, and the remaining are struvite, cysteine and mix matrix, while the other 10% are radiolucent, comprising of uric acid and xanthine calcul [6] .Urinary stones have the potential for becoming clinically symptomatic and could lead to infection, obstruction, renal damage and, in the worst scenario, to the loss of a kidney. This, however, might be effectively prevented if potentially significant stones could be detected prior to the onset of symptoms and be treated appropriately.

On the background of a general increased risk of stone formation for our population, we attempted to assess, therefore, the incidence of clinically silent and yet undiscovered stones in order to assess whether screening for renal stones would be justified. Such a screening would have to be done using a reliable, reproducible, cost-effective, easily available and easy to handle method of examination that does not utilise ionising radiation, which makes ultrasound the method of choice[7]. Our study was conducted on 30 aymptomatic students ,and stone were found in 1 patient(3.3%),so our study is quite similar to study conducted by Reisman et al;[8] who examined 171 male prostatitis patients by abdominal ultrasound screening out of which five patients (2.7%) had silent kidney stones. Similarly Buchholz et al;[9] conducted their study on 201 patients and find out kidney stones in 3% of patients. Inci et al;[10] prospectively followed asymptomatic stone carriers and found that 7 of 24 (29.2%) patients had progression of their nephrolithiasis over a mean period of 52.3 month because of onset of pain (with or without the passage of the stone) or need for urologic intervention. Burgher et al; [11] showed that up to 77% of patients with nephrolithiasis had progression of their disease, defined as an increase in stone size, onset of pain, or need for urologic intervention over 3.26 yr. Bansal et al; [12] concluded that stones found on abdominal ultrasounds, were asymptomatic in 71.4%, whereas 36.8% of stones found on retroperitoneal ultrasound were asymptomatic. Similarly Scales et al;[13] concluded that prevalence of kidney stones was 8.8% among men and the prevalence of stones was 10.6% compared with 7.1% among women. Similarly Yanagawa et al;[14] find out abnormal findings by ultrasound in 39 individuals (10.6%), which included 31 individuals having renal calculi (8.4%), 16 were having hydronephrosis (4.4%), and 1 individual were having a renal cyst (0.3%). This yielded a disease rate of urinary stones in this study of 16.9%.

References

1. Worscester EM, Coe FL. Clinical practice, calcium kidney stones. N Engl J Med. 2010; 363(10): 954- 63.
2. Wood HM, Shoskes DA. The role of nanobacteria in urologic disease. World J Urol 2006; 24(1): 51-4.
3. Sheikh FA, Khullar M, Singh SK. Lithogenesis: induction of renal calcifications by non-bacteria. Urol Res 2006; 34(1): 53-4.
4. Resnick MI, Prisky L. Summary of the National Institutes of Arthritis, Diabetes, Digestive and Kidney Diseases Conference on Urolithiasis: state of the art and future research needs. J Urol 1995; 153: 4-9.
5. Coe FL, Evan A, Worcester E. Kidney stone disease. J Clin Invest 2005; 11:2596-2606.
6. Kabala JE. The kidneys and ureters. In: Sutton D, edr. A Textbook of Radiology and Imaging, 7th ed., Vol. 2. London: Churchill Livingstone; 2003. p. 929-87.
7. Ablett MJ, Coulthard A, Lee RE, et al. How reliable are ultrasound measurements of renal length in adults? Br J Radiol 1995; 68: 1087-9.
8. Reisman EM, Kennedy TJ, Roehrborn CG, et al. A prospective study of urologist-performed sonographic evaluation of the urinary tract in patients with prostatism. J Urol 1991; 145:1186-9.
9. Buchholz NPN, Abbas F, Afzal M Khan R, Rizvi I , Talati J .The incidence of silent kidney stones – an ultrasonographic screening study. J Pak Med Assoc 2003; 53(6): 24-25.
10. Inci K, Sahin A, Islamoglu E, Eren MT, Bakkaloglu M, Ozen H: Prospective long-term follow up of patients with asymptomatic lower pole caliceal stones. J Urol 2007; 177: 2189–2192.
11. Burgher A, Beman M, Holtzman JL, Monga M: Progression of nephrolithiasis: Long-term outcomes with observation of asymptomatic calculi. J Endourol 2004; 18: 534–539.
12. Bansal AD, Jennifer H, David SG. Asymptomatic nephrolithiasis detected by ultrasound. Clin J Am Soc Nephrol 2009; 4(3):680-684.
13. Scales CD Jr, Smith AC, Hanley JM, Sehgal CS. PREVALENCE OF KIDNEY STONES IN THE UNITED STATES. Euro Urol 2012; 62(1): 160-165.
14. Yanagawa M, Kawamura J, Onishi T, Soga N, Kameda K, Sriboonlue P, Prasongwattana V, Borwornpadunqkitti S. Incidence of urolithiasis in northeast Thailand. Int J Urol 1997; 4(6):537-40.