

Recent Literatures and Updated Guidelines on Kidney Stones

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Kidney stones are very common urological problems. The incidence of kidney stones is rising with an estimated global prevalence of 10% to 15%. In the United States, approximately 13% of men and 7% women will develop a kidney stone throughout their lifetime. Recently, guidelines by American Urological Association (AUA) and American College of Physicians (ACP) for management of kidney stones have been published. In addition, a few meta-analyses on kidney stones in this year of 2014 have provided an important data on treatment and epidemiology of kidney stones. The important findings of meta-analyses on this topic in the year of 2014 were summarized in this brief review. *Journal of Nature and Science*, 1(1):e30, 2015.

Kidney Stones | Meta-analysis | Nephrolithiasis | Urolithiasis

Introduction

Kidney stones are very common urological problems. The incidence of kidney stones is rising with an estimated global prevalence of 10% to 15%.¹⁻⁴ In the United States, approximately 13% of men and 7% women will develop a kidney stone throughout their lifetime.^{1, 4} Recently, guidelines by American Urological Association (AUA) and American College of Physicians (ACP) for management of kidney stones have been published.^{5, 6} In addition, a few meta-analyses on kidney stones in this year of 2014 have provided an important data on treatment and epidemiology of kidney stones. This brief review summarized the important findings of meta-analyses on this topic in the year of 2014.

Clinical Effectiveness of Shock Wave Lithotripsy, Retrograde Intrarenal Surgery, and Percutaneous Nephrolithotomy for Lower-pole Renal Stones.

A recent meta-analysis demonstrated that percutaneous nephrolithotomy (PNL) and retrograde intrarenal surgery (RIRS) were superior to shock wave lithotripsy (SWL) in clearing the Lower-pole stones within 3 months.⁷ Lee et. al.⁸ showed that, for stones <10mm, shockwave lithotripsy with adjuvant therapy such as inversion, hydration and forced diuresis appears to have better stone clearance, lower risk of adverse events and need for further treatment for Lower-pole Renal Stones. De et. al.⁹ performed meta-analysis comparing Percutaneous nephrolithotomy (PCNL) Versus Retrograde Intrarenal Surgery and found that PCNL is associated with higher stone-free rates at the expense of higher complication rates, blood loss, and admission times.

The Risk of Kidney Cancer in Patients with Kidney Stones

We performed a meta-analysis of seven studies and found a significant increased risk of renal cell carcinoma (RCC) and transitional cell carcinoma (TCC) in patients with prior kidney stones. However, the increased risk of RCC was noted only in male patients.¹⁰ The finding may impact clinical management and cancer surveillance.

Kidney Stones and Cardiovascular Risk:

Meta-analyses^{11, 12} have shown that kidney stones are linked to increased cardiovascular risk, including the risk for incident CHD or stroke. The risk may be higher in women than men. Further studies are required to determine whether the association is sex specific.

References

1. Goldfarb, DS: Increasing prevalence of kidney stones in the United States. *Kidney Int*, 63: 1951-1952, 2003.
2. Long, LO, Park, S: Update on nephrolithiasis management. *Minerva Urol Nefrol*, 59: 317-325, 2007.
3. Lopez, M, Hoppe, B: History, epidemiology and regional diversities of urolithiasis. *Pediatr Nephrol*, 25: 49-59, 2010.
4. Stamatelou, KK, Francis, ME, Jones, CA, Nyberg, LM, Curhan, GC: Time trends in reported prevalence of kidney stones in the United States: 1976-1994. *Kidney Int*, 63: 1817-1823, 2003.
5. Qaseem, A, Dallas, P, Forcica, MA, Starkey, M, Denberg, TD: Dietary and pharmacologic management to prevent recurrent nephrolithiasis in adults: a clinical practice guideline from the american college of physicians. *Ann Intern Med*, 161: 659-667, 2014.
6. Pearle, MS, Goldfarb, DS, Assimos, DG, Curhan, G, Denu-Ciocca, CJ, Matlaga, BR, Monga, M, Penniston, KL, Preminger, GM, Turk, TM, White, JR: Medical management of kidney stones: AUA guideline. *J Urol*, 192: 316-324, 2014.
7. Donaldson, JF, Lardas, M, Scrimgeour, D, Stewart, F, MacLennan, S, Lam, TB, McClinton, S: Systematic Review and Meta-analysis of the Clinical Effectiveness of Shock Wave Lithotripsy, Retrograde Intrarenal Surgery, and Percutaneous Nephrolithotomy for Lower-pole Renal Stones. *Eur Urol*, 2014.
8. Lee, SW, Chaikunapruk, N, Chong, HY, Liang, ML: Comparative efficacy and safety of various treatment procedures for lower pole renal calculi: a systematic review and network meta-analysis. *BJU Int*, 2014.
9. De, S, Autorino, R, Kim, FJ, Zargar, H, Laydner, H, Balsamo, R, Torricelli, FC, Di Palma, C, Molina, WR, Monga, M, De Sio, M: Percutaneous Nephrolithotomy Versus Retrograde Intrarenal Surgery: A Systematic Review and Meta-analysis. *Eur Urol*, 67: 125-137, 2015.
10. Cheungpasitporn, W, Thongprayoon, C, O'Corragain, OA, Edmonds, PJ, Ungprasert, P, Kittanamongkolchai, W, Erickson, SB: The risk of kidney cancer in patients with kidney stones: a systematic review and meta-analysis. *QJM*, 2014.
11. Liu, Y, Li, S, Zeng, Z, Wang, J, Xie, L, Li, T, He, Y, Qin, X, Zhao, J: Kidney stones and cardiovascular risk: a meta-analysis of cohort studies. *Am J Kidney Dis*, 64: 402-410, 2014.
12. Cheungpasitporn, W, Thongprayoon, C, Mao, MA, O'Corragain, OA, Edmonds, PJ, Erickson, SB: The risk of coronary heart disease in patients with kidney stones: A systematic review and meta-analysis. *N Am J Med Sci*, 6: 580, 2014.

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