

4. Nematbakhsh M, Nasri H. Cisplatin nephrotoxicity may be sex related. *Kidney Int.* 2013;83:1201.
5. Gheissari A, Mehrasa P, Merrikhi A, Madihi Y. Acute kidney injury: A pediatric experience over 10 years at a tertiary care center. *J Nephropathol.* 2012;1:101-8.
6. Baradaran A, Rafeian-Kopaei M. Histopathological study of the combination of metformin and garlic juice for the attenuation of gentamicin renal toxicity in rats. *J Ren Inj Prev.* 2012;2:15-21.
7. Nasri H. Ellagic acid protects against cisplatin-induced nephrotoxicity in rats: a dose-dependent study. *Eur Rev Med Pharmacol Sci.* 2013;17:849-50.
8. Rafeian-Kopaei M. Medicinal plants for renal injury prevention. *J Ren Inj Prev.* 2013;2:63-65.
9. Tavafi M. Protection of renal tubules against gentamicin induced nephrotoxicity. *J Ren Inj Prev.* 2012;2:5-6.
10. Tavafi M. Inhibition of gentamicin-induced renal tubular cell necrosis. *J Nephropathol.* 2012;1:83-6.
11. Pickering JW, Endre ZH. The definition and detection of acute kidney injury. *J Ren Inj Prev.* 2014;3:21-5.
12. Nasri H. Acute kidney injury and beyond. *J Ren Inj Prev.* 2012;1:1-2.
13. Sanadgol H, Abdani S, Tabatabaiee P, Mohammadi M. Protective effect of high dose short term statin therapy with normal saline in prevention of contrast-induced nephropathy among iodixanol-receiving patients. *J Ren Inj Prev.* 2013;1:43-5.
14. Alhamad T, Blandon J, Meza AT, Bilbao JE, Hernandez GT. Acute kidney injury with oxalate deposition in a patient with a high anion gap metabolic acidosis and a normal osmolal gap. *J Nephropathol.* 2013;21:139-43.
15. Tamadon MR, Beladi-Mousavi SS. Erythropoietin; a review on current knowledge and new concepts. *J Ren Inj Prev.* 2013;2:119-21.
16. Jafarey M, Changizi Ashtiyani S, Najafi H. Calcium dobesilate for prevention of gentamicin-induced nephrotoxicity in rats. *Iran J Kidney Dis.* 2014;8:46-52.
17. Nasri H. World Kidney Day 2013: acute kidney injury; a public health aware. *Iran J Public Health.* 2013;42:338-40.

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## What is the Real Risk Factor of Urinary Calculi in Iranian Children?

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The earliest reports on urolithiasis in Iranian children in 1980s revealed calcium oxalate and ammonium acid urate were the most common components of urinary calculi.<sup>1-3</sup> Since then there have been increasing numbers of published studies about the risk factors of urolithiasis in Iranian children. A cross-sectional study conducted by Akhavan and coworkers<sup>4</sup> showed the incidence of urinary calculi in school-aged children in Qom was 1%. They simultaneously studied the urinary excretion of metabolic factors in those school-aged children. Surprisingly, 23% of asymptomatic children without calculus showed hypercalciuria and all of them had hypocitraturia.<sup>4</sup> The result should be interpreted cautiously because of potential

technical error, different normal ranges for Iranian children, or nutritional factors.

Alamzadeh-Ansari and colleagues studied 152 infants with microlithiasis and urolithiasis by collecting 24-hour urine samples in south-west of Iran.<sup>5</sup> In their report published in this issue of the *Iranian Journal of Kidney Diseases*, they detected that 92% had metabolic disorder, family history of urinary calculi was positive in 67%, and at least one-third of parents had consanguinity marriage. Similarly, the most metabolic disorders in this study were hypercalciuria and hypocitraturia. They mentioned neither the rate of mixed metabolic disorders nor the other risk factors such as dehydration, low fluid intake, and the diet of

infants. In addition, the cut points for abnormal level of urinary metabolic excretion rates are age dependent. The author used a fixed definition that is usually utilized for older children and they are not appropriate for infants aged less than 12 months.<sup>5</sup>

Naseri and colleagues used a more accurate definition of urinary excretion for north-west of Iran, stratified by age. However, their study showed lower percentages of hypercalciuria, hypocitraturia, and hyperuricosuria, and 46% of children had no identified reason for calculus formation. This high percentage of idiopathic group might be related to the fact that calculation of the saturation ratio was not considered in patients with urolithiasis.<sup>6</sup> The other articles from the north of Iran showed the same etiology of hypercalciuria and hyperuricosuria as the core component of calculus formation in children.<sup>7,8</sup> However, the other epidemiological studies in different regions and various age categories in Iran demonstrated that the urinary calcium excretion is higher in normal children. Cross-sectional studies in school aged children in Jahrom, Urumieh, and North of Iran,<sup>9-11</sup> and for neonatal period.<sup>12,13</sup>

Safarinejad determined the reference values for urinary calcium, phosphate, magnesium, sodium, and potassium in sample urine and 24-hour urine aliquot.<sup>14</sup> However, this study lacked information about reference value for other metabolic factors such as uric acid, oxalate, and citrate in Iranian children. In conclusion, a multicenter study for defining the reference values of urinary metabolic factors in different regions of Iran and different age categories is essential, and encouraging the laboratories to launch the software of calculating the saturation ratio are important for determining the etiology of urinary calculus formation even in those with normal laboratory tests.

#### CONFLICT OF INTEREST

None declared.

#### REFERENCES

1. Kheradpir MH, Armbruster T. Childhood urolithiasis in Iran: a comparative study on the calculi composition of 121 cases. *Z Kinderchir.* 1985;40:163-9.
2. Miñtón Cifuentes J, Pourmand G. Mineral Composition of 103 stones from Iran. *Br J Urol.* 1983;55:465-8.
3. Kheradpir MH, Bodaghi E. Childhood urolithiasis in Iran with special reference to staghorn calculi. *Urol Int.* 1990;45:99-103.
4. Akhavan-Sepahi M, Sharifian M, Mohkam M, Vafadar M, Hejazi S. Biochemical risk factors for stone formation in healthy school children. *Acta Med Iran.* 2012;50:814-8.
5. Alemzadeh-Ansari MH, Valavi E, Ahmadzadeh A. Predisposing factors for infantile urinary calculus in south-west of Iran. *Iran J Kidney Dis.* 2014;8:70-2.
6. Naseri M, Varasteh AR, Alamdaran SA. Metabolic factors associated with urinary calculi in children. *Iran J Kidney Dis.* 2010;4:32-8.
7. Safaei Asl A, Maleknejad S. Pediatric urolithiasis: an experience of a single center. *Iran J Kidney Dis.* 2011;5:309-13.
8. Mortazavi F, Mahbubi L. Clinical features and risk factors of pediatric urolithiasis. *Iran J Pediatr.* 2007;17:129-133.
9. Emamghorashi F, Davami MH, Rohi R. Hypercalciuria in Jahrom's school-age children: what is normal calcium-creatinine ratio? *Iran J Kidney Dis.* 2010;4:112-5.
10. Nikibakhsh A, Seyedzadeh A, Mahmoodzadeh H, et al. Normal values for random urinary calcium to creatinine ratio in Iranian children. *Iran J Pediatr.* 2008;18:263-6.
11. Sorkhi H, Haji Aahmadi M. Urinary calcium to creatinine ratio in children. *Indian J Pediatr.* 2005;72:1055-6.
12. Hooman N, Honarpisheh A. The effect of phototherapy on urinary calcium excretion in newborns. *Pediatr Nephrol.* 2005;20:1363-4.
13. Hooman N, Taheri Derakhsh N, Samaii H, Arab Mohammad Hoseini A. Blood level and urinary excretion of calcium in neonates with nonphysiological hyperbilirubinemia under phototherapy. *Razi J Med Sci.* 2009;16:195-202.
14. Safarinejad MR. Urinary mineral excretion in healthy Iranian children. *Pediatr Nephrol.* 2003;18:140-4.

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