# Serum calcium level cutoff of 10.3mg/dL (normal level > 10.5mg/dL) optimally identifies recurrent calcium kidney stone patients at risk of normocalcemic hyperparathyroidism.

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| Challenge | Our clinical guidelines recommend workup for Primary Hyperparathyroidism in kidney stone patients with high or high normal serum calcium (sCa). The level that constitutes a high normal serum calcium is not defined. |
| Existing Evidence | There is little to no published evidence concerning the risk of normocalcemic hyperparathyroidism (NCHP) in kidney stone patients and current recommendation is based on clinical principle alone. What little data exists concerns primary hyperparathyroid patients who underwent parathyroidectomy, most of which presented for reasons other than stone disease. |
| Target Population | Recurrent CaOx and CaPO4 stone formers in the Northern California Kaiser Permanente Kidney Stone Prevention program (KSP) data base. |
| Intervention or Exposure | Retrospective review of 3335 prospectively enrolled high risk kidney stone patients.  Analysis of 3001 calcium containing stone formers after exclusion of urate, struvite, and cysteine stone formers.  Sub analysis of 275 patients with serum sCa 10.0 mg/dL or greater; 241 of these patients had been fully evaluated and constitute the main focus of this study. |
| Outcomes/Key Findings | The number of patients with high or high normal serum calcium levels in the overall population of patients was relatively low; 275 of 3001 patients.  However, hyperparathyroidism was relatively common among 241 calcium containing stone formers with a high or high normal sCa; 40 patients with either NCHP or PHP were identified and 34 of them either underwent surgical intervention or are awaiting surgery.  Of 196 patients with a sCa 10-10.5 mg/dL , 14 were found to have NCHP (7.1%).  2.6% of patients with sCa 10-10.2 mg/dL had NCHP;  24% of patients with sCa 10.3-10.5 mg/dL had NCHP.  Of 45 patients with sCa >10.5mg/dL, 26 were found to have PHP (58%).  11 of 14 patients with NCHP underwent surgical treatment or are awaiting surgery.  23 of 26 patients with PHP underwent surgical treatment or are awaiting surgery.  Conclusion: A significant number of high risk kidney stone patients with high normal serum calcium levels have NCHP. A cutoff of 10.3 – 10.5 mg/dL provided the best discrimination to balance appropriate surveillance versus unnecessary evaluation and care. |
| Resulting Action/Change | Modify our program to evaluate only patients with sCa > 10.2 mg/dL and continue to evaluate patients with high serum calcium levels.. |
| Additional Recommendations | Emphasize importance of evaluating recurrent stone patients with high normal serum calcium levels to urologists and non-urologists. |
| Implementation Tools | Present findings within KP, Urology Regional Chiefs group and Northern California Urologists Share more broadly with primary care physicians and stone management programs.at the American Urological Association Western Section 2021 meeting. |
| Implementation and Follow-up Measures | Immediate modification of the KSP protocol, proportions of patients with kidney stones and high normal calcium who have appropriate work/up for hyperparathyroidism (and lack of work/up for patients below at-risk target range. |
| Reference(s) [Key Figure if applicable] |  |