

STONE DISEASE

Forced Versus Minimal Intravenous Hydration in the Management of Acute Renal Colic: A Randomized Trial

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Background and Purpose: The management of acute renal colic is a problem commonly encountered by both urologists and emergency medicine physicians. The classic approach to managing uncomplicated acute renal colic involves hydration, along with imaging and pain control. Previous studies have suggested that hydration has a significant impact on patient comfort, as well as spontaneous stone passage. This study evaluated the effects of maintenance vs forced hydration and its effect on the pain experienced from renal colic.

Patients and Methods: Forty male and 18 female patients with a mean age of 41 years suspected to have acute renal colic were identified in the emergency department. After screening and informed consent, the patients were enrolled in the study, and 43 patients were eventually available for analysis. Patients received intravenous (IV) analgesia, imaging with a noncontrast CT scan of abdomen and pelvis, and assignment to either forced IV hydration with 2 L of normal saline over 2 hours (N = 20) or minimal IV hydration at 20 mL of normal saline per hour (N = 23). A visual analog pain scale was completed hourly for a total of 4 hours. Demographic information, laboratory and imaging results, narcotic use in morphine equivalents (ME), and pain scores were recorded and compared. Spontaneous stone passage rates were also calculated by careful patient follow-up. Results were considered statistically significant at $p < 0.05$.

Results: Stone size was equivalent in the two treatment groups ($p > 0.05$). There was no difference in the narcotic requirement in ME ($p = 0.644$) between the two groups. Similarly, there was no difference in hourly pain score or stone-passage rates between the groups ($p > 0.05$).

Conclusions: Treatment of uncomplicated renal colic has traditionally included vigorous intravenous hydration, as well as medications for the control of pain and nausea. Our data suggest that maintenance intravenous fluids are as efficacious as forced hydration with regard to patient pain perception and narcotic use. Moreover, it appears the state of hydration has little impact on stone passage.

Editorial Comment

This study demonstrates that in the emergency room (ER) setting, forced hydration for acute renal colic does not impact pain or stone passage. However, it is important to note that this study evaluates hydration only in the acute ER setting. It is common practice for patients to be instructed to force oral hydration after discharge from the emergency room. Compliance with this recommendation and its impact on subsequent stone passage was not evaluated in this study, and may be worthwhile of further investigation. While the study relies on chart review and self-reporting to document stone passage, other studies have suggested that self-reporting of stone passage may be inaccurate in a significant proportion of patients. The authors do not report the duration of follow-up or time to stone passage, though the 30% spontaneous stone passage rate is lower than one might expect in relation to the mean stone size. Location of ureteral calculi was not reported, and could be a confounding variable in the equation. In addition, the utility of forced hydration may depend on the fluid status of the patient and the time from onset of pain to presentation to the ER. As renal hemodynamics adapt to obstruction within the first 24 hours, the impact of hydration may diminish with delayed presentation. It may be useful to evaluate

response to hydration based on the presence of volume depletion (BUN/CR ratio) and the time to presentation (< or > 24 hours from onset of pain).

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One Week of Ciprofloxacin Before Percutaneous Nephrolithotomy Significantly Reduces Upper Tract Infection and Urosepsis: A Prospective Controlled Study

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Objective: To evaluate whether 1 week of ciprofloxacin before percutaneous nephrolithotomy (PCNL) in patients with stones of > or = 20 mm or pelvicalyceal dilatation, reduces urosepsis, as we previously reported that such patients have four times the risk of urosepsis after PCNL.

Patients and Methods: Patients undergoing PCNL, and who fulfilled strict selection criteria, were recruited prospectively into a study which was conducted in two phases. The study methods were similar to those previously described; patients with dilated pelvicalyceal systems and/or stones of > or = 20 mm from phase 1 (previously published) acted as controls. In the subsequent phase, the same selection criteria applied and only those with stones of > or = 20 mm and/or dilated pelvicalyceal systems were given ciprofloxacin 250 mg twice daily for 1 week before PCNL and comprised the treatment arm. Midstream urine samples, renal pelvic urine and fragmented stones were collected to assess culture and sensitivity. Systemic inflammatory response syndrome (SIRS) was used to define urosepsis after PCNL. The urologists monitoring the patients after PCNL and conducting the analysis were all unaware of the characteristics of the stones or intravenous urography findings before PCNL. In all, 115 patients (54 in phase 1 and 61 in phase 2) were recruited, of whom 46 in phase 1 and 52 in phase 2 had stones of > or = 20 mm and/or a dilated pelvicalyceal system, and became the control and treatment arms, respectively.

Results: The patient demographics were similar in both arms. There was three times less risk of upper tract infection (relative risk 3.4, 95% confidence interval 1.0-11.8, P = 0.04) and SIRS (2.9, 1.3-6.3, P = 0.004) in the patients receiving ciprofloxacin (treatment arm).

Conclusions: The administration of oral ciprofloxacin for 1 week before PCNL in patients with stones of > or = 20 mm or dilated pelvicalyceal systems significantly reduced the risk of urosepsis.

Editorial Comment

The authors selected patients with significant hydronephrosis or stone burdens greater than 2 cm as candidates for this study, based on an initial study, which suggested that these patients were at greater risk for having an infected upper tract at the time of PCNL (1). However, this study also concluded that there was no correlation between SIRS and stone burden or degree of hydronephrosis.

This is a non-blinded non-randomized study comparing results to a historical cohort. Accepting these limitations in study design, the results are still dramatic with regards to the 3-fold decrease in upper tract infection and SIRS. I am still not convinced regarding the clinical relevance of SIRS as defined by the criteria presented. For example, pain may increase the HR and RR, which would satisfy the criteria for SIRS. The stress of surgery can cause transient leukocytosis. Elevations in temperature and respiratory rates may be related to

atelectasis. Preoperative antibiotics would not be anticipated to impact any of these events. The authors do not state what measures were taken to exclude other common causes of fever, tachycardia, and tachypnea during post-PCNL recuperation, such as atelectasis, hypovolemia, and pain. The Consensus panel that developed the definition of SIRS states that it is “overly sensitive and non-specific”, and caution that major surgical procedures as well as cardiogenic events may result in the clinical picture similar to SIRS(2). The consensus panel also cautions that sepsis should be defined as the presence of SIRS and infection.

References

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ENDOUROLOGY & LAPAROSCOPY

Laparoscopic Dismembered Pyeloplasty in Children Younger Than 2 Years

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Purpose: Since the first laparoscopic pyeloplasty was described in a child in 1995, there have been several reports of pyeloplasty in older children. However, to date there have been few reports of laparoscopic pyeloplasty in infants and toddlers. The aim of this study was to evaluate the results of laparoscopic pyeloplasty in children younger than 2 years.

Materials and Methods: All laparoscopic Anderson-Hynes pyeloplasties performed in children younger than 2 years were retrospectively reviewed. The diagnosis of ureteropelvic junction obstruction was confirmed on renal sonography and diuretic renogram. Laparoscopic pyeloplasties were performed via a transperitoneal route as originally described, with key modifications. All children were investigated with postoperative diuretic renogram and renal ultrasonography.

Results: A total of 38 children with ureteropelvic junction obstruction underwent laparoscopic Anderson-Hynes Pyeloplasty between January 2001 and December 2005. Of these patients 11 (7 males and 4 females) were younger than 2 years at surgery (median 1.4, range 2 to 22 months) and 1 had bilateral ureteropelvic junction obstruction, for a total of 12 primary repairs. However, 2 patients (17%) required redo laparoscopic pyeloplasty, for a total of 14 laparoscopic dismembered pyeloplasties in this age group. Operative time ranged from 70 to