

POSTER PRESENTATION

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The effect of balanced versus non-balanced fluid replacement on urinary biomarkers in patients undergoing colectomy: a prospective observational pilot study

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Intr

Several studies have suggested an association between chloride rich fluids and acute kidney injury (AKI) in peri-operative and critically ill patients [1]. The mechanism of injury has not been fully described but renal haemodynamic effects and a change in oxidative stress have been hypothesised. Urinary Cystatin C (uCysC) is a sensitive and early marker of renal tubular injury [2]. Levels of uCysC correlate well with adverse clinical outcomes such as AKI and mortality. Urinary neutrophil gelatinase-associated lipocalin (uNGAL) has been shown to be an excellent predictor of acute renal injury in paediatric and adult cardiac surgery [3] but has not previously been studied in non-cardiac surgery.

Objectives

To assess the effect of balanced versus non-balanced fluid replacement in peri-operative patients using uCysC and uNGAL.

Methods

We performed a prospective observational pilot study on patients with normal baseline renal function undergoing elective colectomy. Patients received either Hartmann's Solution or 0.9% Saline intra-operatively according to a stroke volume variation based protocol. Urine samples were taken at baseline, on completion of surgery, 4 hours and 12 hours post completion. Baseline and post-operative day 1 creatinine levels were measured.

Results

Twenty patients (n = 20) were recruited for this pilot study, 10 in each group. There was no significant difference in gender distribution, mean age, mean pre-op pH, mean baseline NGAL and Cystatin between the groups. Patients receiving 0.9% Saline had a higher post-op chloride with a mean difference of 4.4 mmol (95% 0.3-7.98, p = 0.019). pH was lower in the saline group (7.33 vs 7.37) but this was not statistically significant (p = 0.10). No significant difference was seen in intra-operative fluid volume and urine output at 4 hours. Patients receiving 0.9% Saline had a higher urine output at 12 hours with mean difference of 239 ml (95%CI 61.04-416.97, p = 0.011). There was no significant difference between pre and post op uNGAL or uCysC at 4 and 12 hours in both groups. There was no significant difference in level of uNGAL or uCysC between the two groups at all time-points.

Conclusions

Patients treated with 0.9% Saline but not Hartmann's Solution developed hyperchloremia but this did not result in a rise in uNGAL or uCysC. Patients undergoing elective colectomy do not develop a rise in uNGAL or uCysC as a result of the operative process, unlike those undergoing cardiopulmonary bypass.

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