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# *Letters*

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## Encapsulating peritoneal sclerosis—a life-threatening condition treated successfully with adhesiolysis and Jones tube insertion

Sir,
Encapsulating sclerosing peritonitis, a life-threatening abdominal disease, is characterized by the formation of multiple fibrous adhesions. This leads to a 'cocoon' of fibrous tissue, encapsulating either the small or whole bowel—causing intestinal obstruction.

It was first recognized as a complication of peritoneal dialysis (PD) in 1980 [1], where it usually presents as small bowel obstruction, ascites or ultrafiltration failure. It is thought to be related to both duration of catheter use and peritoneal membrane transport characteristics, being more common in 'fast transporters' [2]. Convincing evidence of cure has come only from adhesiolysis, which releases the fibrous adhesions [1]. Intraluminal stenting after adhesiolysis for small bowel obstruction was first described by White in 1956. Despite the technique being modified by Munro and Jones in 1978 [3], it has never gained widespread popularity in the UK. The major complication of surgery is a high recurrence rate. In one series, 11/47 patients (23.4%) experienced recurrence, 10 undergoing a second operation, and 4 requiring a third operation [4]. The mortality is uncertain, with a wide range reported (2–56%). The rationale for our technique was to further reduce mortality and recurrence rate, and provide an alternative to drug treatments (e.g. immunosuppression) whose side effects carry considerable morbidity.

A 69-year-old woman, on PD for 10 years for ERF, was converted to haemodialysis in January 2003 due to recurrent peritonitis. In June 2003, she presented with recurrent ascites. An abdominal CT scan (below) suggested multiple encapsulating loculated collections in the abdomen. TPN was given for 6 weeks before surgical intervention. In September 2003, a laparotomy revealed encysted dense adhesions and a large pseudocyst in the pelvis entrapping the bowel. The adhesions were released and a Jones tube was placed through the entire length of the gastrointestinal tract. A Jones tube is a 3 m (18 gauge) tube with side perforations and a balloon at the distal end. During surgery, the tube was advanced via the nasogastric route through the entire length of the bowel and the distal end came out of the rectum. The balloon was inflated and the small bowel arranged in orderly fashion, so that even if fibrosis did occur, the bowel did not get entrapped. This was left *in situ* for 1 week, with TPN and haemodialysis continuing. She was discharged 7 months later and is currently well on haemodialysis, with no evidence of recurrence.

In ERF patients, encapsulating peritoneal sclerosis is a rare disease and is usually a long-term complication of peritoneal dialysis. This type of surgery has to be slow (4 h in our case) and careful, releasing bowel from fibrous bands all along its length. Adhesiolysis with intraluminal stenting should be considered as an option in the treatment of encapsulating peritoneal sclerosis.

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## Investigation of the association between oral sodium phosphate use and kidney injury

Sir,
Recently we published a report in which we found no apparent association between oral sodium phosphate (OSP) purgative use and incident chronic kidney disease (CKD): OR (95% CI) 0.70 (0.44–1.11) [1]. Published concurrently with our study was another study by Hurst [2] that reported a potent association between OSP use and acute kidney injury (AKI): OR (95% CI) 2.35 (1.51–3.66) [2]. We were intrigued at the dramatic differences in findings, and undertook additional sensitivity analyses of our data in order to explore possible explanations. Potential sources for discrepancy include differences in timing of post-colonoscopy

**Table 1.** Results of analyses 1, 2 and 3

| | Analysis 1 ($n = 465$) | Analysis 2 ($n = 465$) | | Analysis 3[c] ($n = 281$) | |
|---|---|---|---|---|---|
| Case definition (% rise in SCr baseline to follow-up) | 50% | 25% | 50% | 25% | 50% |
| Baseline SCr | Most recent pre-colonoscopy | | | | |
| Follow-up SCr | Latest within 6 months post-colonoscopy | Earliest post-colonoscopy | | Earliest post-colonoscopy | |
| # Cases/# OSP exposed | 26/14 | 90/56 | 19/11 | 50/32 | 10/6 |
| # Controls/# OSP exposed | 439/282 | 375/240 | 446/285 | 231/160 | 271/186 |
| Unadjusted OR (95% CI) | 0.65 (0.27–1.58) | 0.93 (0.56– 1.54) | 0.78 (0.28– 2.27) | 0.79 (0.40– 1.60) | 0.69 (0.16–3.40) |
| Adjusted OR (95% CI)[a] | ND | 0.87 (0.52– 1.46) | ND | 0.76 (0.37– 1.56) | ND |
| Adjusted OR (95% CI) using propensity score analysis[b] | 0.75 (0.32–1.73) | 0.89 (0.54– 1.46) | 1.15 (0.43– 3.07) | 0.78 (0.39– 1.54) | 0.96 (0.25– 3.79) |

[a]Adjustment was made for age, race (white, non-white and unknown), gender, clinical site, diabetes, congestive heart failure, ACEi/ARB use, diuretic use and colonoscopy indication (screening/surveillance versus symptomatic) using multivariable logistic regression model.
[b]Adjustment was made for above using propensity score analysis.
[c]Analysis 3 was restricted to subjects over the age of 50, undergoing colonoscopy for routine screening or surveillance, and excluding those who received purgatives other than OSP or polyethylene glycol. (No adjustment was made for colonoscopy indication.)
SCr: serum creatinine; ND: not done.

creatinine considered, case definition and population under study.

In order to determine the impact of case definition on findings, we conducted analysis 1 in which case status was reassigned according to Hurst's criterion (50% rise in serum creatinine [2]). The adjusted OR (95% CI) was 0.75 (0.32–1.73) (Table 1).

In order to examine the association between OSP and AKI, Hurst defined outcome based on the most proximate post-colonoscopy serum creatinine [2]. Thus, we conducted analysis 2 in which case status was defined according to the change between baseline and earliest available post-colonoscopy creatinine. Adjusted ORs (95% CIs) were 0.87 (0.52–1.46) and 1.15 (0.43–3.07) using 25% and 50% serum creatinine rise as case definition, respectively (Table 1).

Hurst limited inclusion to subjects over the age of 50 undergoing colonoscopy for screening purposes, and considered as controls only subjects receiving polyethylene glycol [2]. Thus, we conducted analysis 3 in which we restricted observation to those subjects meeting Hurst's criteria ($n = 281$). The adjusted ORs (95% CIs) were 0.76 (0.37 to 1.56) and 0.96 (0.25–3.79) based on case definitions of 25% and 50% rise in serum creatinine, respectively.

Multiple case reports and series suggest an association between OSP use and 'acute phosphate nephropathy.' The issue here is whether these represent rare, idiosyncratic reactions or a more generalized risk to the population at large. The only prior controlled study of the renal consequences of OSP exposure suggests that there is not a predisposition toward systematic CKD [3], consistent with our present (and past) findings.

These analyses suggest that timing of post-colonoscopy creatinine considered, case definition and certain characteristics of the subjects studied do not account for the dramatic differences between Hurst's findings and our own. Our study included a much higher proportion of patients who were non-white, had diabetes or congestive heart failure; it is possible that differences result from as yet unrecognized effect modification on these bases.

Some limitations of the present analyses bear note. In reassigning case/control status, there was diminution of the number of available cases and statistical power; thus, we cannot exclude the possibility of type II error. As AKI was not our original outcome of interest, we lack data on certain exposures that potentially confound the association between OSP and AKI (e.g. iodinated contrast exposure and non-steroidal anti-inflammatory use), and, therefore, we could not adjust on these bases.

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## The implications of aspirin resistance in renal failure

Sir,

Aspirin resistance is a phenomenon where the expected inhibition of platelet responses is not obtained as evaluated by different biological tests [1]. In addition to non-compliance and other patient-related factors, one of the main reasons for aspirin resistance is its inability to inhibit thromboxane $A_2$ ($TXA_2$) biosynthesis *in vivo*.

Many studies have also shown that patients with aspirin resistance are more likely to have an increased rate of recurrence of vascular events [2,3]. Interestingly, in a recent systematic review by Krasopoulos *et al*., the relationship between resistance to aspirin and a history of renal impairment was observed ($P < 0.03$) [4]. This was considered as possibly a chance finding, mainly because of lack of substantial data. However, an abnormality of platelet arachidonic acid metabolism has been well documented to exist in patients with renal impairment [5]. This leads to altered thromboxane synthesis that is a key factor for the development of resistance to aspirin. Initially thought to be due to a 'functional cyclo-oxygenase defect', it is now considered to be due to the increased activity of phospholipase A2 in the platelets of patients with uraemia [5,6].

Thromboxane has also been shown to play an important role in the physiological function of the kidney, and $TXA_2$ receptors have been shown to exist in renal vasculature and other nephron segments in animal models [7,8]. Various studies have shown that $TXA_2$ plays a key role in the regulation of renal haemodynamics mainly acting in conjunction with angiotensin II. $TXA_2$, in addition to angiotensin II and arginine–vasopressin constrict larger vessels within the renal vascular tree via activation of a rho-associated kinase pathway [9]. Thromboxane receptor knockout mice demonstrated reduced renal blood flow and increased filtration fraction and renal vascular resistance, despite normal basal mean arterial blood pressure and glomerular filtration rate [10].

Enhanced production of thromboxane in the kidney has been demonstrated in several diseases including lupus nephritis, ureteral obstruction and nephrotoxic renal injury [11,12,13]. In a normal kidney, the production of $TXA_2$ and prostaglandin $I_2$ is well controlled, and the balance between them is important in maintaining homeostasis *in vivo*. In patients with the above conditions, however, $TXA_2$ synthesis is higher compared to that of prostaglandin $I_2$. The administration of thromboxane antagonists decreased the severity of these diseases, supporting the important role of thromboxane in their pathogenesis. Kwag *et al*. demonstrated that dietary vitamin E decreased the elevated phospholipase A2 in the kidney tissues of diabetic rats and improved the prostaglandin $I_2/TXA_2$ balance in the kidney microsomes thus improving vascular complications [14].

Chronic kidney disease is now recognized as an independent risk factor for cardiovascular events, and cardiovascular disease is the major cause of mortality in patients with the disease [15]. Possibly, the increased aspirin resistance in patients with renal failure may indicate that a similar vascular pathology, involving among others thromboxane, exists in these two different vascular beds. More work on the thromboxane pathway is required in the patients with renal impairment, who develop recurrent cardiovascular events, despite being on aspirin. This would pave the way for novel treatments that would help in preventing the progression of both the renal and cardiovascular pathologies.

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