**Evaluation of serum phosphate levels in surgical patients receiving intravenous Ferric Carboxymaltose**

**Linda K Wijaya, PhD1,2; Darren Dahly, PhD3, The PREVENTT Team, Toby Richards, MD, PhD1**

1Division of Surgery, Medical School, Faculty of Health and Medical Sciences, University of Western Australia, Perth, Australia.

2College of Science, Health, Engineering and Education, Murdoch University, Perth, Western Australia, Australia

3 School of Public Health, University College Cork, Ireland

Categories / keywords: Blood transfusion services / risks of transfusion

**Introduction:** ThePREVENTT trial was a two-arm parallel double-blind randomized controlled trial aimed at understanding the effects of pre-operative intravenous iron in anaemic patients undergoing major abdominal surgery. As there is a risk of hypophosphatemia following iron transfusion, an exploratory analysis was undertaken to determine whether this condition affects the patient outcomes. Serum phosphate levels were evaluated in surgical patients who had received intravenous iron or placebo and correlated to the main study outcomes and safety analysis.

**Methods:** The study protocol was approved by the UK National Research Ethics Committee East of England and has been described elsewhere[1]. A single 1000 mg dose of ferric carboxymaltose (Ferinject®) or placebo were administered 10–42 days before surgery. Serum phosphate levels were measured at baseline and preoperatively.

In an exploratory analysis, whether phosphate levels were predictive of heterogenous treatment effects (HTE) was investigated using generalized linear models. The interaction between phosphate levels and the main study outcomes: a composite of death or the need for any blood transfusion in 30 days (1st co-primary endpoint), the count of blood transfusions in the first 30 days (2nd co-primary endpoint), ICU length of stay, and any postoperative grade 3+ complications were investigated. HTE was considered for subgroups based on commonly used definitions of phosphate levels, as well as continuously measured phosphate modelled with restricted cubic splines. Interactions were evaluated visually and with likelihood ratio tests of the relevant nested models.

**Results:** In the intention-to-treat sample (n=474), serum phosphate was measured in 421 patients at baseline and 392 patients preoperatively (354 patients had phosphate measured at both time points and 15 had it measured at neither). There was no difference in phosphate levels between iron and placebo groups at baseline. Preoperative phosphate levels were 0.21 mmol/L lower in the iron arm vs the placebo arm (-0.21 95%CI -0.27 to -0.14), and the odds of having a low serum phosphate (< 0.8 mmol/L) was higher in the iron arm (OR 9.211 95%CI 4.25 to 19.94). There was no evidence of HTE in any of the outcomes, by phosphate subgroups, or by continuously measured phosphate levels.

**Conclusions:** Hypophosphatasemia occurred in patients who had an intravenous iron transfusion compared to the placebo group. However, there were no significant impacts in patient outcomes and any adverse events between patients receiving either iron or placebo.

**References:**

[1] Richards, T., Baikady, R.R., Clevenger, B., *et al.*, Lancet, 2020. **396**(10259):1353-61.