Multi-site Drug Use Evaluation: Phosphate Replacement Point Prevalence Audit

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Background

Phosphate is an abundant element within the human body which is critical in many biochemical processes1. Expenditure on intravenous phosphate preparations in Queensland Health hospitals is high. The current Queensland Health guidelines for management of electrolyte disturbances do not recommend a preferred route of administration for management of mild to moderate hypophosphataemia2. Both intravenous (Low K Phos®) and oral formulations are recommended as equal treatment options and as such, there is potential that patients in this severity cohort may be managed unnecessarily with intravenous therapy, thus increasing medication costs.

Aim

To determine the current use and cost of intravenous and oral phosphate supplements in different patient cohorts across multiple Queensland hospitals and to provide recommendations based on the findings to the state working group responsible for reviewing the current Queensland health guidelines.

Methods

A retrospective point-prevalence chart audit was conducted at six hospitals of admitted patients whose serum phosphate level was below 0.8mmol/L. The audit was for a seven-day period.

Results

A total of 830 data points of phosphate levels below 0.8mmol/L were recorded and analysed.
Overall, 76% percent of phosphate doses ordered were in accordance with the Queensland Health guidelines for management of electrolyte disturbances, with respect to the formulation used.

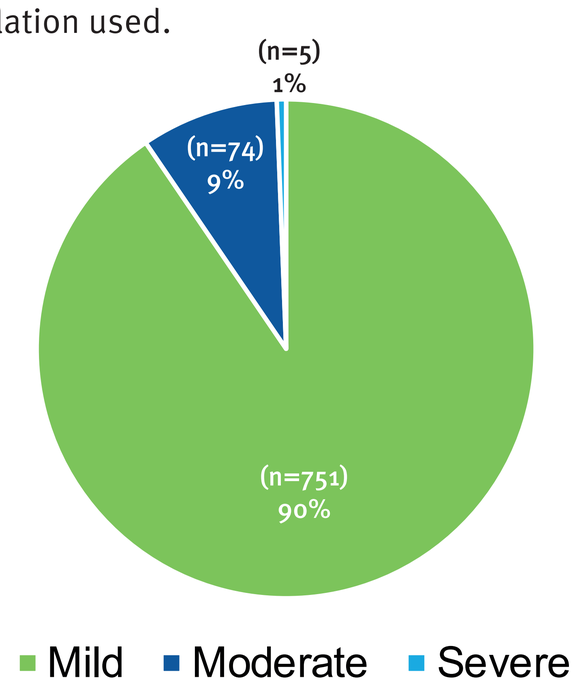

Figure 1: Proportion of serum phosphate levels indicative of mild, moderate or severe

The majority of patients audited had serum phosphate levels indicative of mild hypophosphataemia. In keeping with expectations, severe hypophosphataemia was infrequent, accounting for only 1% of phosphate levels in this audit.
Within the mild to moderate categories, there was a total of 37 Low K Phos® ampoules used. 13 of these ampoules were deemed to be unnecessary, as the patients did not have a stated clinical reason that would have precluded oral therapy or intravenous and oral therapy was used concurrently.

Table 1. Quantity and cost-analysis of intravenous compared phosphate replacement prescribed to patients with serum levels indicative of mild or moderate hypophosphataemia which was potentially able to be substituted with oral phosphate replacement

Assessment of IV vs ORAL replacement				
Category	No of ampoules used where oral could have been sufficient	Cost of these ampoules 2018	Cost of alternative oral therapy^	Potential savings
Mild	11	$518.99	$11.88	$507.11
Moderate	2	$94.36	$2.16	$92.20
Total				$599.20
Annual extrapolation (for the six participating hospital sites)				$31,164.12

^1 tablet = elemental phosphorus 500 mg; phosphate 16.1mmol; Low K phos® vial = Each mL has 13.4mmol (1260mg) of phosphate ions

Extrapolating results to an annualised figure estimated that appropriate substitution of intravenous with oral therapy amongst asymptomatic patients with mild or moderate hypophosphataemia and a viable enteral route would result in a saving of $31,164 in direct drug costs per year. Additional benefits such as reduced nursing time and improved patient comfort could also be expected with this change.

Conclusion(s)

There will invariably be clinical circumstances where intravenous phosphate therapy is warranted outside of the severe setting. However, oral therapy should be considered as a first line option for asymptomatic patients with mild to moderate hypophosphataemia who are able to tolerate oral therapy and will have acceptable absorption levels.

Improvement to current guidelines with a clearer indication for oral therapy over intravenous therapy where clinically appropriate could result in potential monetary savings as well as reducing labour time and improving patient comfort.

References

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