**Loading doses of IV aminophylline: serum concentrations and clinical outcomes**

**Background:** Intravenous aminophylline is a second line treatment for children suffering an acute exacerbation of asthma. A loading dose of 5mg/kg is recommended for children who do not take oral theophylline in order to achieve a target therapeutic range of 10-20mg/l. This dose was calculated based on theoretical pharmacokinetic data. This study aims to assess whether a 5mg/kg loading dose achieves therapeutic levels, and report on the clinical outcomes using routine therapeutic drug monitoring (TDM) data.

**Method:** A prospective audit analysing the serum theophylline levels and outcomes of children who receive a 5mg/kg loading dose for an acute exacerbation of asthma between August 2014 and October 2015.

**Results**: Of 29 admissions requiring IV aminophylline, 16 children were on maintenance doses (and therefore did not receive loading doses). Thirteen children were therefore included. All children received 5mg/kg IV aminophylline. Twelve TDM samples were taken ≤1 hour post dose (8 were ≤30 minutes). One child achieved serum theophylline levels between 10-20mg/l, 12 children had levels <10mg/l and no children had levels >20mg/l. The average theophylline level achieved was 7.9±0.5mg/l. Mean length of stay was 4.6±3.7 days, mean days until in child in air was 2.0±0.6, and mean days until managed on only 5 puffs inhaled salbutamol 4 hourly was 3.1±0.4 days. One child require PICU admission. The adverse effects of cardiac arrhythmias, nausea, hypokalaemia and hypoalbuminaemia were seen in 0, 2, 5 and 3 children respectively.

**Conclusion:** A 5mg/kg loading dose fails to achieve a serum level of >10mg/l. The resolution of in children who require iv aminophylline is slow, and adverse effects are noted in this popuation. Research to determine the optimal loading dose of aminophylline is required.