The Use Of Glucagon In The Treatment Of Hypoglycaemia Due To Congenital Hyperinsulinism

C Jadawji, M S Estebanez, R Padidela, L Bowden, L Rigby, J Kinzell, K E Cosgrove, M J Dunne, I Banerjee

Background
• Congenital Hyperinsulinism (CHI) can cause severe hypoglycaemia with consequent adverse neurodevelopment
• Continuous Glucagon Infusion (CGI) has been utilised to achieve glycaemic stability – its efficacy has not been systematically reported

Aims
• To review the efficacy of CGI and assess the complications associated with glucagon infusion

Methods
• A retrospective review was conducted, in a cohort of 31 children over a 5 year period
• The efficacy of CGI was reviewed by assessing the impact on the glucose infusion rate (GIR) within 48 hours of treatment
• Factors affecting severity of CHI: K-ATP channel gene mutations, diazoxide unresponsiveness, requirement for second-line treatment with octreotide and sub-total pancreatectomy were also assessed in relation to CGI

Results
• CGI in a dose of 5 mcg/kg/hour administered either intravenously (n=29) or subcutaneously (n=2) reduced GIR from a mean (interquartile range) of 15.9 (8.1) to 11.5 (4.9) mg/kg/minute. See Fig. 1
• Reduction independent of factors affecting the severity of CHI
• Maximum dose required to achieve euglycaemia [12.4 (15) mcg/kg/hour] was directly correlated with the pre-glucagon GIR [R²=0.7, p<0.001]
• Duration of 33 (30) days of CGI helped maintaining euglycaemia in addition to therapy with diazoxide or octreotide [n=16]

Complications
• 1 patient developed a necrolytic migratory erythema (NME) – Resolved once CGI discontinued. Refer to Fig. 2
• Crystallization of glucagon can lead to line obstruction, though not reported in this study

Conclusions
• CGI is effective in reducing GIR in patients with CHI in the short and long term management
• Generally safe, NME is a possible adverse event with CGI treatment