

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

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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 [$R^2=0.7$, $p<0.001$]
- 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

Fig. 1: A Box-plot demonstrating the difference in the GIR, both pre-glucagon and 48 hours post-glucagon administration

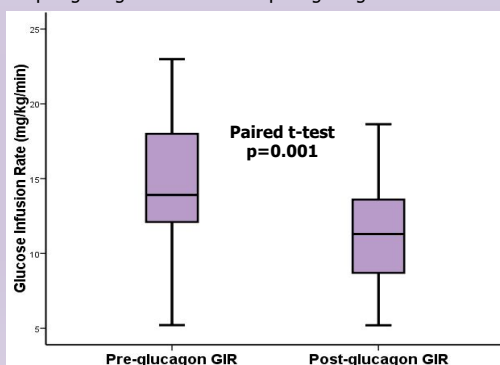


Fig. 2: Images depicting NME after administration of subcutaneous CGI



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