Congenital hyperinsulinism

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Congenital hyperinsulinism (CHI) causes severe and persistent hypoglycaemia in the infancy and childhood period. CHI is one of the most difficult conditions to manage in paediatric endocrinology. The biochemical profile is one of hyperinsulinaemic hypofattyacidaemic hypoketotic hypoglycaemia reflecting the dominant actions of unregulated insulin secretion. As these patients cannot utilize alternative fuels the management of CHI must be prompt and aggressive in order to avoid brain damage.

Recent advances have begun to unravel the enigma of this disease. So far mutations in five different genes have been described that lead to unregulated insulin secretion from pancreatic β-cells. The commonest cause of CHI are mutations in the genes (ABCC8 and KCNJ11) regulating the function of the two subunits (SUR1 and KIR6.2 respectively) of the pancreatic β-cell K_{ATP} channel. Other rare causes include gain of function mutations in the genes GCK (glucokinase), GLUD 1 (glutamate dehydrogenase) and mutations in the SCHAD (short chain L-3-hydroxyacyl-CoA dehydrogenase) gene.

The histological differentiation of CHI into focal and diffuse disease has radically changed the surgical approach to this disease. It is now imperative to identify those children with focal disease as limited resection of the focal lesion is curative and avoids the risks of diabetes mellitus. Methods of differentiating focal and diffuse disease have included pancreatic venous sampling and intra-arterial calcium stimulation tests. More recently laparoscopic biopsy of the pancreas has been used to identify those children with diffuse disease and a relatively non-invasive method using 18F-DOPA PET scan has been used to localize the focal lesions.

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