

Introduction to Insulinomas

Signalment

Insulinomas are malignant insulin-secreting tumours of the pancreatic B-cells. They typically occur in middle aged-elderly dogs and both males and females are equally affected. Any breed can be affected although it usually affects large breeds with Labrador/retrievers, standard poodles, fox terriers, Irish setters and German shepherd dogs possibly being predisposed.

Clinical Signs

Clinical signs are usually related to hypoglycaemia and include seizures intermittent weakness, collapse, ataxia / hind limb weakness, muscle tremors, polyphagia, polyuria / polydipsia and weight gain. The signs may be associated with periods of exercise or play. The clinical signs are usually short lived and intermittent. The tumours are usually responsive (*secrete insulin*) to increases in blood glucose and so paradoxical hypoglycaemia and associated clinical signs may occur 2-4 hours after feeding.

Diagnostic Tests

Routine biochemical and haematological evaluation is usually unremarkable and these profiles should be performed to help exclude some of the other causes of *hypoglycaemia* (*hypoadrenocorticism, liver disease, septicemia*). Laboratory diagnosis of an insulinoma relies on demonstration of fasting hypoglycaemia and inappropriately normal or increased circulating insulin concentrations. Insulin concentration should be measured on separated serum. At the same time, whole blood for glucose estimation should be collected. The serum for insulin determination should be frozen immediately after separation and transported frozen to the laboratory for analysis. If equivocal results are obtained with the glucose and insulin measurements, consider re-testing on a second occasion or using the insulin:glucose ratio. Please call the laboratory for further advice in this situation.

Treatment

Hypoglycaemic seizures should be treated with 1ml/kg 50% dextrose intravenously over 5-10 minutes. This can be repeated as required. Dogs should be maintained on a glucose infusion until eating again. At home, owners can use glucose gels which are smeared on the gums. Surgical removal of the tumour is potentially curative. However, metastatic spread is common and many patients are poor anaesthetic candidates. With no evidence of metastases, 50% dogs that have surgery survive 18 months compared to 6 months if distant spread is present at diagnosis. Mean survival time for medically managed patients is 12 months from the onset of clinical signs. Medical management involves drug therapy and dietary modification. The goals of medical therapy are to control the clinical signs, not to re-establish euglycaemia. Affected dogs should be given small meals frequently. Exercise should be restricted and heavy exertion avoided. Prednisolone (0.5-1mg/kg twice daily (alter dose to effect) antagonises insulin activity and promotes gluconeogenesis and is useful in managing affected dogs. The lowest effective dose should be used since therapy is lifelong and the side effects can be problematic. Diazoxide (5-30mg/kg twice daily) (*"Eudemine", unlicensed*) acts by inhibiting insulin secretion. It also promotes gluconeogenesis and can also be a useful addition (*usually alongside prednisolone*). However gastrointestinal side effects or occasionally blood dyscrasias are a potential complication of this drug. Both drugs may have progressively less effect with time. Octreotide may have some beneficial effects but this has not been consistently demonstrated and it requires frequent subcutaneous administration. Somatostatin and Alloxan have been used as "last resorts" and may have some beneficial effect. However, they are not routinely used due to variable effectiveness and their potential for complications.