Assessment of selective arterial calcium stimulation and hepatic venous sampling to localize insulin-secreting tumours

Michael Brändle, T Pfammatter, G A Spinas, R Lehmann & C Schmid

OBJECTIVE: Non-invasive localization modalities such as ultrasound, computed tomography (CT) or magnetic resonance imaging (MRI) often fail to localize insulinomas smaller than 2 cm in diameter. Recent studies have shown that the selective arterial stimulation and hepatic venous sampling (ASVS) technique using intra-arterial calcium as the insulin secretagogue facilitates the regionalization of such occult insulinomas. This study assesses the sensitivity of ASVS in localizing insulin-secreting tumours. SUBJECTS AND METHODS: Eleven consecutive patients (8 women), aged 29-82 years, were studied over the past 4 years at our hospital. Hyperinsulinaemic hypoglycaemia due to an insulin-secreting tumour was proven in all patients. Calcium gluconate (0.025 mEq/kg body weight) was injected directly into the arteries supplying the pancreas and the liver. Insulin levels were measured in samples taken from the right hepatic vein before and 30, 60 and 120 s after each injection. The ASVS technique was performed in all 11 patients; the results were compared with the surgical findings in 10 patients and the autopsy findings in 1 case. The ASVS results were also compared with the findings of other, previously performed imaging modalities. RESULTS: ASVS correctly localized 4 insulin-secreting tumours to the head, 3 to the body, 1 to the tail, 2 to the tail or body of the pancreas and 1 to the liver. Thus, the sensitivity was 100% (11/11) whereas other localization techniques were less sensitive: 7/11 tumours were detected by angiography, 4/8 by endosonography, 3/8 by CT and 1/6 by MRI. Insulinomas (confirmed by histological examination), sized 4-25 mm, were found in 10 patients. All were cured by selective surgery and remained free of hypoglycaemia over the next 1-4 years of follow-up. An insulin-secreting neuroendocrine tumour in the liver was documented in 1 case at autopsy. CONCLUSIONS: Arterial stimulation and hepatic venous sampling is a very sensitive technique for preoperative localization of insulin-producing tumours. It can help to plan minimally invasive surgery and to select an appropriate strategy for patients suffering from malignant tumours in others.

type journal paper/review (English)
date of publishing 9-2001
journal title Clinical endocrinology (55/3)
ISSN print 0300-0664