A plasma glucose concentration below 2.5 mmol L-1 is not an appropriate criterion to end the 72-h fast

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CONTEXT: The classical end-point to terminate the 72-h fast in a patient evaluated for a hypoglycaemic disorder is the occurrence of hypoglycaemic symptoms in association with a low plasma glucose level. However, neither the symptoms nor the plasma glucose level have been exactly defined. OBJECTIVE: To determine whether a useful cut-off plasma glucose concentration as criterion to end the prolonged fast in the absence of neuroglycopenic symptoms can be defined. DESIGN: Single centre case-control study. SETTING: Tertiary referral hospital in Switzerland. SUBJECTS: The 72-h fast was prospectively performed in 23 consecutive patients (17 women and six men) following a standardized protocol between July 1999 and January 2002. All patients were referred to our clinic for evaluation of suspected hypoglycaemia. The criterion to end the fast before 72 h was defined by the occurrence of symptoms or signs typical for neuroglycopenia irrespective of plasma glucose levels. MAIN OUTCOME MEASURE: Insulin levels and insulin to plasma glucose ratios in insulinoma patients and in individuals without insulin-secreting tumours at termination of the fast and at plasma glucose levels $\leq2.5$ mmol L-1, prior to the occurrence of neuroglycopenic symptoms. RESULTS: In seven patients, the fast was terminated before 72 h because they developed neuroglyco-penic symptoms. Insulin-secreting tumours were found and successfully removed in these seven patients. Sixteen individuals developed no neuroglycopenic symptoms throughout the 72-h fast and an insulin-secreting tumour could be excluded in these 16 patients. Five of these 16 individuals had plasma glucose levels $\leq2.5$ mmol L-1 during the 72-h fast. Insulin levels and insulin to glucose ratios in insulinoma patients and healthy individuals overlapped during as well as at termination of the fast. Prior to the occurrence of neuroglycopenic symptoms and at venous plasma glucose $\leq2.5$ mmol L-1, insulin to plasma glucose ratios dropped in insulinoma patients to values within the normal range on several occasions. CONCLUSIONS: Terminating the fast at plasma glucose levels $\leq2.5$ mmol L-1 does not allow confirmation or exclusion of an insulin-secreting tumour. Thus, the occurrence of symptoms or signs typical for neuroglycopenia is the prerequisite criterion to end the fast before 72 h.