



medications should be carefully determined by considering the risk/benefit balance of each patient.

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Pituitary insufficiency: A cause of hypoglycemia in an elderly diabetic patient

Dear Editor,

Hypoglycemia most likely occurs in the elderly as a result of poor glucose tolerance. The most common cause of hypoglycemia in elderly patients is antidiabetic drugs. Adrenal insufficiency, insulinoma and pituitary insufficiency are rare causes of hypoglycemia in older age.¹ Particularly in old patients, non-specific findings, such as weakness, fatigue and loss of appetite caused by pituitary insufficiency, might be attributed to aging.² Here, we reported an elderly patient with diabetes mellitus and hypopituitarism, presenting with refractory hypoglycemia and acute renal failure under therapy with oral antidiabetic drugs.

A 67-year-old woman was referred to geriatric clinic with symptoms of confusion, irritability, slowness of speech and movements, loss of appetite, nausea, and vomiting. A physical examination of her vital signs showed blood pressure 80/50 mmHg, pulse rate 104/min, body temperature 37.7°C and respiration 24/min. The patient was lethargic with incomplete cooperation (Karnofsky performance score of 30%). She had been taking metformin 2000 mg/day and gliclazide 30 mg/day with the diagnosis of diabetes for 2 years. In the biochemical examination, blood glucose, blood urea-nitrogen, creatinine, sodium and potassium were 32 mg/dL, 60 mg/dL, 3.2 mg/dL, 132 mmol/L and 4.9 mmol/L, respectively. After she was admitted to the geriatric clinic, her glucose infusion was given. Our initial evaluation of the clinical and laboratory parameters suggested that it could be acute renal failure as a result of dehydration and hypoglycaemia, which were the consequence of the prolonged effect of gliclazide. For this reason, oral antidiabetic drugs were discontinued, and glucose infusion was carried out. During her

Table 1 Endocrinological laboratory results

Parameters		Normal range
Blood cortisol	1.38 ug/dL	6.2–19.4 ug/dL
TSH	0.055 uIU/mL	0.4–4.2 uIU/mL
Free T4	13.24 pmol/L	10.3–23.2 pmol/L
IGF-1	1.00 mg/L	1.73–5.11 mg/L
GH	<3 µg/L	
PRL	0.57 ng/mL	3–20 ng/mL
FSH	2.02 mIU/mL	25.8–134.8 mIU/mL
LH	1.36 mIU/mL	7.7–58.5 mIU/mL
Estradiol	27.96 pg/mL	5–54.7 pg/mL
C peptide	1.02 ng/mL	0.9–7.1 ng/mL
Insuline	2.83 µU/mL	3–28 µU/mL

All the laboratory results were measured between 08.00 hours and 09.00 hours, and confirmed by a second determination. FSH, follicle stimulating hormone; GH, growth hormone; IGF1, insulin-like growth factor-1; LH, luteinizing hormone; PRL, prolactin; TSH, thyroid stimulating hormone; T4, thyroxine.

clinical follow up, we realized that her kidney functions had substantially increased. However, hypoglycemia persisted. Afterwards, all of the persistent hypoglycemia, hyponatremia and hypotension were evaluated, and the results were considered to be hypocortisolemia. The patient's other laboratory results, which were obtained during a hypoglycemia period, are presented in the Table 1. The basal serum cortisol (1.38 µg/dL) and adrenocorticotrophic hormone levels (less than 0.3 U/L) showed strong evidence of cortisol deficiency. Due to these results, pituitary insufficiency was diagnosed. However, magnetic resonance imaging and magnetic resonance angiography did not show any structural or vascular abnormalities in the hypophysis and brain. Once prednisolone (7.5 mg/day) treatment

was started, all of the symptoms not only resolved dramatically, but also her Karnofsky score increased to 80%, and she was discharged and followed by the outpatient clinics.

In the literature, the causes of hypopituitarism in older persons are defined as pituitary adenomas, sequela of irradiation, or surgery for pituitary tumors, peripituitary tumors, vascular conditions, traumatic brain injury, infiltrative or granulomatous disease and infections.³ As none of these were shown to be the cause, and the pituitary fossa was also normal in size, we diagnosed idiopathic hypopituitarism in our elderly diabetic case. Furthermore, as a rule, hypopituitarism is clinically underestimated in the elderly, because typical symptoms that are less frequent than in younger patients and overlap with those of aging, severe hyponatremia and hypoglycemia are rare.⁴ In addition, hypoglycemia, one of the most common acute complications of diabetes mellitus, often occurs as a consequence of oral antidiabetics or insulin use in geriatric diabetic patients.¹ In such cases, metabolic disorders facilitating the emergence of hypoglycemia should be taken into account when starting treatment.^{5,6} Thus, for each geriatric case, whether it is diabetes or not, it is important to evaluate the patient in terms of metabolic disorders and to assess the blood glucose level. In addition, diabetes and hypopituitarism together, as in the present case of an elderly patient with diabetes mellitus and hypopituitarism presenting with refractory hypoglycemia and acute renal failure under therapy with oral antidiabetic drugs, is an unusual situation.⁷ When the literature was reviewed, the coincidence of diabetes mellitus and hypopituitarism in older persons was reported only in case reports and idiopathic hypopituitarism in elderly diabetics, as in our case, is not a common clinic presentation in the elderly.

Finally, although the most frequent cause of hypoglycaemia in geriatric diabetics is oral antidiabetic drugs, hypopituitarism should also be kept in mind for the differential diagnosis of hypoglycaemia in these cases.

Disclosure statement

None of the co-authors has any direct or indirect conflicts of interest, financial or otherwise, relating to the subject of this case report.

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Clinical utility of accelerometry in geriatric rehabilitation

Dear Editor,

Until recently, there was no accurate, affordable method to monitor activity of patients in hospital.^{1–3} Tri-axial accelerometers provide an opportunity to monitor patient activities using a validated algorithm (sensitivity 95.9% and specificity 98.7%) to interpret machine signals.^{4,5} A small intervention–control pilot study aimed to examine the feasibility of using accelerometry to monitor walking and evaluate the effect of provision of accurate walking times to patients and clinicians in promoting walking in a geriatric rehabilitation ward.

A total of 11 consecutive patients admitted to the ward were alternately allocated to intervention (six

patients) or controls (five patients). All patients were asked to attach an accelerometer device, a tri-axial ALIVE Heart and Activity Monitor (monitors leased from Alive Technologies, Ashmore, Qld, Australia), over their right hip using an adjustable belt. The accelerometer was removed at bed and shower time. Research staff recorded times when the devices were worn, as well as entry and exit time to the gymnasium for each patient. For the intervention group, the research assistant extracted and analyzed accelerometer data, and provided daily feedback of total walking time to patients and the treating team. In the control group, feedback was not provided. We used Mann–Whitney non-parametric tests to compare the difference in walking time between the two groups.