



## PITUITARY MACROADENOMA: AN UNLIKELY CAUSE OF HYPOGLYCAEMIA: A CASE REPORT

SONIKA LAMBA<sup>a</sup>, RUPAN DEEP KAUR<sup>b</sup>, MANOJ RAWAL<sup>c1</sup>, SAMEER AGGARWAL<sup>d</sup> AND NAVTEJ SINGH<sup>e</sup>

<sup>a</sup>Department of Medicine, Bhagat Phool Singh Government Medical College for Women, Sonapat, Haryana, India

<sup>b</sup>Junior Resident, Bhagat Phool Singh Government Medical College for Women, Sonapat, Haryana, India

<sup>c</sup>Department of Paediatrics, Bhagat Phool Singh Government Medical College for Women, Sonapat, Haryana, India

<sup>d</sup>Department of Physician, APEX Hospital, Rohtak, Haryana, India

### ABSTRACT

A 80 year old male, r/o VPO Gunar, District Sonapat, Haryana (farmer by occupation) admitted in the Department of Medicine, Pt. B.D. Sharma PGIMS Rohtak. Recurrent episodes of abnormal tonic spasms of bilateral upper limb since 1 year and multiple episodes 3-4 times a day during which the patient did not respond to verbal stimulus which characteristically recovered after patient had water mixed with sweetened substance. During the episode of hypoglycaemia, insulin C-peptide levels, serum cortisol levels were done which ruled out endogenous hyperinsulinism and pointed towards deficient adrenal reserve as a cause of hypoglycaemia. MRI brain was done which revealed pituitary macroadenoma resulting in hypocortisolemia. Visual field charting revealed left side temporal hemianopia due to mass effect of the tumour. On further evaluation T3 and LH was found to be low. During the episode of hypoglycemia, insulin, C-peptide were tested. These were found to be low, thus excluding the diagnosis of insulinoma. During the episode of hypoglycemia, cortisol was found to be 6.45 ng/ml (it should have been >19 at the time of stress) this indicates deficient ACTH reserve. Visual field charting revealed l/ hemianopia. This points to be a important differential diagnosis in a case of recurrent hypoglycemia which is often overlooked in clinical practice.

**KEYWORDS:** Pituitary, Macroadenoma, Hypoglycaemia

Hypoglycaemia is most often caused by drugs taken to control diabetes. Much less common causes of hypoglycaemia include other drugs, critical illness or organ failure, pituitary macroadenoma and an insulin-producing tumour in the pancreas. Hypoglycaemia influences quality of life and increases the risk of cardiovascular event (Frier *et al.*, 2011) (Barendse *et al.*, 2012). When subjects suffer from hypoglycaemia, they usually notice it with warning symptoms such as cold sweating and/or palpitation, but recurrent hypoglycaemia can lead to the impairment of counter-regulatory hormone response and awareness of hypoglycaemia which sometimes leads to life-threatening hypoglycaemic coma (Widom and Simonson, 1992) (Kinsley *et al.*, 1995) (Lingenfelter *et al.*, 1995) (Kaneto *et al.*, 1998). Macroadenoma is relatively a rare cause of adrenal deficiency. Consequent adrenal deficiency is often accompanied by severe hypoglycaemia. Hydrocortisone replacement therapy is essential for this condition, but gastrointestinal symptom such as nausea and vomiting is not well-recognized adverse effect of hydrocortisone.

A patient with pituitary adenoma may present with visual field defects, classically temporal hemianopia.

It arises from the compression of the optic nerve by the tumour. Non-secreting adenomas can go undetected for an extended time until clinical evidence appears. Here we present a case report of patient of pituitary macroadenoma who presented with hypoglycaemia.

### CASE REPORT

A 80 year old male, r/o VPO Gunar, Distt.- Sonapat, Haryana (India) farmer by occupation admitted in the Department of Medicine, Pt. B.D. Sharma PGIMS Rohtak. Recurrent episodes of abnormal tonic spasms of bilateral upper limb since 1 year and multiple episodes 3-4 times a day during which the patient did not respond to verbal stimulus which characteristically recovered after patient had water mixed with sweetened substance. On presentation in ward, blood sugar charting was done which revealed hypoglycaemic episodes during 72 hours fasting. At the time of presentation his blood sugar was 40mg/dl. Blood pressure on presentation 130/80mmHg on right arm supine. General physical examination was unremarkable. Patient was evaluated in view of keeping in mind various causes of endogenous hyperinsulinism. During the episode of hypoglycaemia insulin C-peptide

<sup>1</sup>Corresponding author

and serum cortisol was taken. Insulin value was 70 uU/ml (should be greater than 3 Uu/ml). C-peptide value was less than 0.3 ng/ml should have been greater than 0.6 ng/ml. Serum cortisol was 6.45 ug (should have been >9 at the time of stress). These investigations ruled out endogenous hyperinsulinism and pointed towards deficient ACTH reserve as the cause of hypoglycaemia. On further investigations, serum testosterone, T3 and T4 were found to be low. This pointed towards

hypopituitarism. MRI brain was done which revealed a non-functioning pituitary adenoma producing mass effect. Visual field charting was done which revealed left hemitemporal hemianopia. Patient had got operated for cataract surgery in right eye and had developed postoperative endophthalmitis and resulting visual loss since the last six months. Patient was started on prednisolone 40 mg OD medication after which he was symptomatically normal.



Figure 1: MRI showing pituitary macroadenoma

## DISCUSSION

Since our patient had experienced severe hypoglycemia many times, he was referred to our hospital to examine the pathogenesis of severe hypoglycemia. There was no abnormality in the chest and abdomen and no pretibial pitting edema. He had no history of traumatic head injury. Furthermore, he had no history of risky jobs and the martial arts, especially boxing and full contact Karate. Electrolytes, whole blood count, renal and liver function were normal. In addition, there was no findings that made us suspect any malignancy, auto-immune and/or inflammatory disease. Based on these findings, we ruled out the possibility of exogenous administration of insulin or other anti-diabetic drugs, insulinoma and insulin autoimmune syndrome. After glucose injection, he once became conscious, but severe hypoglycemia was often observed even after that. In addition, counter-regulatory hormone levels were not increased even at the time of hypoglycemia. Similar findings were observed in case report of a 64-year-old-woman with hypothalamic hypopituitarism by Takai *et al.*, 2015.

We ruled out the possibility of malignancy, sarcoidosis, tuberculosis and traumatic injury, all of which could be the reason for hypothalamic hypopituitarism (Sharma and Sharma, 1991) (Kinsley *et al.*, 1995) (Greco, 2012) (Glezer and Bronstein, 2012) and thus we thought that the hypothalamic hypopituitarism in this subject was idiopathic. In addition, counter-regulatory hormone levels were not increased even at the time of hypoglycemia. We think that this was presumably due to recurrent hypoglycemia as previously reported (Widom and Simonson, 1992).

## CONCLUSION

Pituitary macroadenoma is an important clinical diagnosis which produces mass effect resulting in visual field effects and produces hypocortisolism, hypothyroidism. This diagnosis must be kept in mind in the work up of every patient presenting with recurrent hypoglycaemic episodes with headache or visual field disturbances.

## REFERENCES

Barendse S., Singh H. and Frier B.M., 2012. The impact of hypoglycaemia on quality of life and related

patient-reported outcomes in Type 2 diabetes: a narrative review. *Speight J. Diabet. Med.*, **29**(3):293-302.

Frier B.M., Scherthaner G. and Heller S.R., 2011. Hypoglycemia and cardiovascular risks. *Diabetes Care*, **34**(2):S132-7.

Glezer A. and Bronstein M.D., 2012. Pituitary autoimmune disease: nuances in clinical presentation. *Endocrine*, **42**(1):74-9.

Greco D.S., 2012. Pituitary deficiencies. *Top Companion Anim. Med.*, **27**(1):2-7.

Kaneto H., Ikeda M., Kishimoto M., Iida M., Hoshi A., Watarai T., Kubota M., Kajimoto Y., Yamasaki Y. and Hori M., 1998. Dramatic recovery of counter-regulatory hormone response to hypoglycaemia after intensive insulin therapy in poorly controlled Type I diabetes mellitus. *Diabetologia*, **41**(8):982-3.

Kinsley B.T., Widom B. and Simonson D.C., 1995. Differential regulation of counter regulatory hormone secretion and symptoms during hypoglycemia in IDDM. Effect of glycemic control. *Diabetes Care*, **18**(1):17-26.

Lingenfelser T., Buettner U., Martin J., Tobis M., Renn W., Kaschel R. and Jakober B., 1995. Improvement of impaired counter regulatory hormone response and symptom perception by short-term avoidance of hypoglycemia in IDDM. *Diabetes Care*, **18**(3):321-5.

Sharma O.P. and Sharma A.M., 1991. Sarcoidosis of the nervous system. A clinical approach. *Arch. Intern. Med.*, **151**(7):1317-21.

Takai M., Kaneto H., Kamei S., Mune T. and Kaku K., 2015. A case of hypothalamic hypopituitarism accompanied by recurrent severe hypoglycemia. *Springer Plus*, **4**: 173. Published online 2015 Apr 10. doi: 10.1186/s40064-015-0934-6.

Widom B. and Simonson D.C., 1992. Intermittent hypoglycemia impairs glucose counter regulation. *Diabetes*, **41**(12):1597-602.