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Acute Monocytic Leukemia with Pituitary Involvement: A Case Report

Hipofiz Tutulumu ile Seyreden Akut Monositik Lösemi Olgusu

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Abstract

Central nervous system involvement is rare in acute myeloid leukemia (AML) cases. Pituitary involvement seems much more rarely with unknown frequency. A 29-year-old male patient was admitted to our clinic with the complaints of visual disturbance and poor performance status. His medical history revealed AML- M5 diagnosed five years ago and allogeneic hematopoietic stem cell transplantation performed in 2010. During follow-up in remission, his complaints had begun. In our clinic, the patient was diagnosed with AML M5 relapse associated with panhypopituitarism and central diabetes insipidus. Chemoradiotherapy was initiated immediately and hormone replacement therapy started due to hypopituitarism. His complaints partially resolved. He is still being followed up with intermittent intrathecal and systemic chemotherapy. Although rare, leukemic infiltration of the pituitary gland should be evaluated in leukemic patients with visual disturbance, hypopituitarism or central diabetes insipidus. *Turk Jem 2015; 19: 69-71*

Key words: Monocytic leucemia, panhypopituitarism, diabetes insipidus

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Özet

Akut myeloid lösemide (AML) santral sinir sistemi tutulumu nadirdir. Hipofizer tutulum sıklığı bilinmemekle birlikte çok daha nadirdir. Yirmi dokuz yaşında erkek hasta genel durum bozukluğu ve görmede bozulma şikayetleri ile hastanemize başvurdu. Beş yıl önce AML- M5 tanısı konmuş ve 2010 yılında allojenik kök hücre nakli uygulanmıştı. Remisyonda takip edilirken bu şikayetleri başlamıştı. Hastaya AML-M5 nüksüne bağlı panhipopituitarizm ve santral diabetes insipitus tanısı kondu. Hemen kemoredyoterapi başlandı ve hipofiz yetmezliğine yönelik replasman tedavisi başlandı. Şikayetlerinde kısmi gerileme oldu. Hasta halen aralıklı olarak intratekal ve sistemik kemoterapi ile takip edilmektedir. Nadir görülmesine rağmen lösemi tanısı olan bir hastada görme bozukluğu hipofizer yetmezlik ve santral diabetes insipitus saptanırsa hipofizer lösemik infiltrasyon araştırılmalıdır. *Turk Jem 2015; 19: 69-71*

Anahtar kelimeler: Monositik lösemi, panhipopituitarizm, diabetes insipidusni

Çıkar Çatışması: Yazarlar bu makale ile ilgili olarak herhangi bir çıkar çatışması bildirmemiştir.

Introduction

Central nervous system involvement is rare in acute myeloid leukemia (AML) cases. Pituitary involvement is much more rarely seen with unknown frequency (1) and if left untreated, may result in death. Although rarely seen, leukemic infiltration of the pituitary gland should be evaluated in leukemic patients with visual disturbance, hypopituitarism or central diabetes insipidus (CDI) (2). To date, AML presenting with CDI has been reported in over 80 patients (3). The presence of both anterior and posterior pituitary deficiency is even rarer with unknown prevalence. Here, we present a patient with AML-M5 (French-American-British (FAB) classification), panhypopituitarism and CDI.

Case Report

A 29-year-old male patient was admitted to our hematology clinic with visual disturbance and poor performance status. His medical history revealed allogeneic hematopoietic stem cell transplantation performed in 2010 after chemotherapy with the diagnosis of acute monocytic leukemia. During follow-up in remission, the patient had visual disturbance in left eye and poor performance status. Central facial paralysis and visual loss was found in physical examination and relapsed leukemia was diagnosed. Leukemic infiltration of the pituitary gland, infundibulum, optic chiasm and brain parencyhma was seen on cranial magnetic resonance imaging (MRI)

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(Figure 1 a,b). Chemo-radiotherapy and dexamethasone therapy were planned. Endocrine assessment revealed the following; fasting blood glucose: 98 mg/dl (70-109), sodium: 146 mmol/L (136-145); potassium: 4.48 mmol/L (3.5-5.1). Liver and renal function tests were within normal limits. Blood examination revealed leucopenia (WBC: 2800 K/uL), platelet count was slightly elevated (420.000/µl) and haemoglobin level was 11.7 g/dl. Pituitary hormone levels are presented in Table 1. Since dexamethasone therapy was started for cerebral infiltration and edema, ACTH-cortisol axis could not be evaluated, however, due to decreased levels of all other pituitary hormones, the patient was considered to have also secondary adrenal deficiency. Replacement treatment with L-thyroxine was started due to central hypothyroidism after dexamethasone therapy. After the initiation of this treatment, urine output was noticed to be 6000-7000 cc per day. Water deprivation test showed worsening of hypernatremia (sodium: 151 mEq/L), and serum osmolality test showed hyperosmolality (312 mosm/kg) with inappropriate low urine osmolality (130 mOsm/kg). Urinary osmolality was increased by two times following vasopressin administration (Table 2). Nasal 1-deamino-8-D-arginine vasopressin (DDAVP) was started with the diagnosis of central diabetes insipidus. Polyuria and polydipsia were improved under DDAVP treatment. Following the completion of radiotherapy the patient was discharged with desmopressin acetate (Minirin® Nasal Spray) 1*1, levothyroxine sodium 125 mcg, deltacortril 7.5 mg tablet and recommendation of outpatient control. After ten months of follow-up, CDI and visual field were partially improved, but central hypothyroidism and secondary adrenal failure remained. Control pituitary MR imaging showed partially regression of leukemic infiltration. He is still being followed with intermittent intrathecal and systemic chemotherapy.

Table 1. Anterior pituitary function evaluation

	Results	Reference range
ACTH	10.8 pg/mL	20-62.8
Cortisol	4.1 µg/dl	12-28.3
FT3	1.6 pg/mL	2.0-4.4
FT4	0.43 ng/dL	0.93-1.7
TSH	0.46 µlU/mL	0.27-4.2
LH	0.12 µlU/mL	1.7-8.6
Testosterone	0.02 ng/mL	2.18 – 9.05
IGF 1	53 ng/mL	86-330
Prolactin	3.6 ng/ml	4.04 – 15.2

ACTH: Adrenocorticotropic hormone, FT3: Free iodotironin, FT4: Free thyroksin, TSH: Thyroid-stimulating hormone, LH: Luteinizing hormone, IGF-1: Insuline like growth factor-1

Discussion

CDI in patients with AML is uncommon (1) with a prevalence of less than 1%. It may occur at the same time or after the diagnosis of hematological disease (4). CDI associated with AML may develop due to leukemic infiltration and different mechanisms such as chromosomal abnormality, dysmegakaryopoiesis and thrombocytosis. Monosomy 7 is the most common cytogenetic

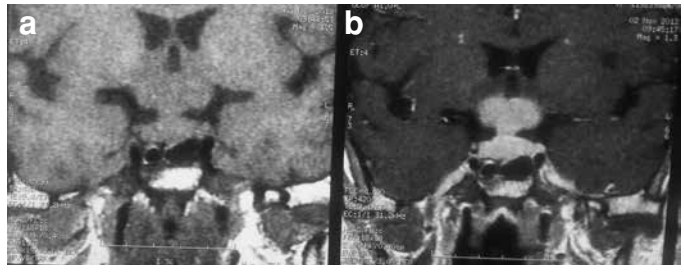

Figure 1. MRI of sella turcica. **(a)** Sagittal section, T1-weighted images showing involvement of pituitary gland, infundibulum and optic chiasm by leukemic infiltration, and loss of hyperintense signal of the posterior pituitary. T1-weighted post gadolinium enhanced MR images show a contrast-enhancing thickened pituitary gland, stalk and optic chiasm. **(b)** Coronal section, T1-weighted images and post gadolinium enhanced MR demonstrating enlarged pituitary gland, optic chiasm and stalk

Table 2. Water deprivation test; before and after DDAVP administration

Hour	Blood pressure (mm/Hg)	Heart rate (rate/ min)	Weight (kg)	Urine output (ml)	Urine specific gravity	Urine osmolality (mosm/kg)	Plasma osmolality (mosm/kg)
0	130/80	76	73.4		1001	120	298
1	130/80	73	72.6	600	1001	130	302
2	120/80	78	71.9	500	1001	130	310
3	110/70	86	71.4	500	1002	130	312
DDVAP administered							
4	120/80	80	72	150	1010	240	306
5	130/70	76	72.4	-	1015	400	290

chromosomal abnormality determined in these cases (5). It has been shown that the presence of DI and monosomy 7 was associated with higher mortality rates than DI without this abnormality (3). The other chromosomal abnormality is structural abnormalities on the long arm of chromosome 3 (6). In genetic analyses, there was no chromosomal abnormality in our patient. Lavabre-Bertrand et al. described trombocytosis in three patients with AML and DI, all showing monosomy 7 and chromosome 3 abnormalities (7). Interestingly, these three cases had a normal computed tomography scan of the brain. The authors stated that this might be a new disease entity. Although our patient had slightly elevated platelet count, there was pituitary involvement by leukemic cells on MRI, differently from previous cases. When pituitary involvement detected, hormone function tests are required for both anterior and posterior lobes of the pituitary gland. Adrenal insufficiency and hypothyroidism may mask diabetes insipidus, thus, steroid and thyroxin treatment can cause diabetes insipidus (8). We found only three cases of AML presenting with panhypopituitarism and DI in the literature. However, subtypes of AML were not stated in those reports except one case due to acute myelomonocytic leukemia (9,10,11). In the English literature, we could not detect any published case of acute monocytic leukemia with panhypopituitarism and CDI.

Conclusion

Although rare, leukemic infiltration of the pituitary gland should be evaluated in leukemic patients presenting with visual disturbance, hypopituitarism or CDI. The diagnosis should be established and appropriate treatment must be given immediately due to potential serious complications if left untreated.

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