Unexpected outcome (positive or negative) including adverse drug reactions

Abnormal head movement in a patient with tuberculous meningitis

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Summary

The bobble-head doll syndrome is characterised by abnormal head movements. These head movements are usually 'yes–yes' (up and down) type; rarely, head movements are 'no–no' (side-to-side) type. Commonly described causes of the bobble-head doll syndrome include third ventricular tumours, suprasellar arachnoid cysts, aqueductal stenosis and other lesions in the region of the third ventricle of the brain. We report a case of tuberculous meningitis with hydrocephalus; in this patient bobble-head doll syndrome developed following external ventricular drainage. In our patient, placement of intraventricular drain led to massive dilatation of the frontal horn of the left lateral ventricle because of blocked foramina of Monro on the left side. The bobble-head doll syndrome, presumably, developed because of the pressure effect of the dilated third ventricle on the dorsomedial nucleus of the thalamus, red nucleus and dentatorubrothalamic pathways. We think that distortion of the third ventricle was responsible for the impairment of the functions of all these structures.

BACKGROUND

Tuberculous meningitis is a serious disorder of central nervous system primarily affecting the meninges of brain and spinal cord. Tuberculous meningitis predominantly affects the basal parts of the brain. The characteristic pathological features of tuberculous meningitis include meningeal inflammation, basal exudates, vasculitis and obstruction of flow of cerebrospinal fluid resulting in hydrocephalus. Obstruction to the flow of cerebrospinal fluid occurs because thick basal exudate blocks the openings of fourth ventricles, at Sylvian aqueduct or at the opening of the tentorium.¹ Ventriculo-peritoneal shunting is an important form of treatment for hydrocephalus. In advanced stages of tuberculous meningitis shunt surgery is usually required, especially, if external ventricular drainage demonstrates an improvement in sensorium.² Common complications of external ventricular drainage include infections, cerebrospinal fluid leak, external ventricular drain-related haemorrhage and malposition of the tube.³

Bobble-head doll syndrome is very rare and a unique movement disorder seen in patients with structural lesions in the region of third ventricle. The head movements in bobble-head doll syndrome are usually 'yes–yes' (up and down) type; rarely, head movements are 'no–no' (side-to-side) type. Our patient had both types of movements. This syndrome was first described by Benton *et al*⁴ in a child who had hydrocephalus due to third ventricular cysts. Commonly described causes of this syndrome include third ventricular tumours, suprasellar arachnoid cysts, aqueductal stenosis and other lesions in the region of the third ventricle along with communicating hydrocephalus.⁵ We are reporting an interesting case of bobble-head doll syndrome in patients with tuberculous meningitis following external ventricular drainage.

CASE PRESENTATION

A 20-year-old man was admitted with fever, headache and frequent vomiting of 1 month duration. Examination revealed that the patient had altered sensorium (E2, V3 and M5). Other findings observed were nuchal rigidity, and left sixth cranial nerve palsy.

INVESTIGATIONS

Cerebrospinal fluid examination revealed elevated protein (214 mg/dl), low glucose (21 mg/dl) and a raised count of lymphocytes (74 per mm³). PCR and cerebrospinal fluid culture for *Mycobacterium tuberculosis* was positive. CT revealed the presence of extensive basal exudates and mild hydrocephalus. He was diagnosed as having definite tuberculous meningitis (stage II).

TREATMENT

The patient was treated with four drug antituberculosis therapy and corticosteroids.

OUTCOME AND FOLLOW-UP

One month later, the patient got readmitted with profound vision loss. He was able to perceive only hand movements. However, his sensorium was better (E3, V4 and M5). Pupils were dilated and sluggishly reactive to light. Fundus examination revealed pale disks. A repeat CT showed enlargement of ventricles. The patient was shifted to the neurosurgery ward where an external ventricular drainage was performed. Approximately, 24 h after surgery, the patient developed continuous involuntary forward and backward and side-to-side movement of the head at a frequency of 2–3 Hz (Video 1). Head movement disappeared during sleep. There was no response to treatment with clonazepam. A postsurgery CT revealed a marked dilatation of frontal horn of left lateral ventricle

Video 1 Showing abnormal head movement (of bobble-head doll syndrome).

compressing over surrounding structures (figure 1). After 3 days, the tube was removed. Head movements were still present after 21 days. The patient was lost to follow-up after this period.

DISCUSSION

Our patient was an unusual patient of bobble-head doll syndrome. In our patient head movement started after the patient was subjected to cerebrospinal fluid drainage but because of malfunction of drain, patient developed dilatation of frontal horn of left lateral ventricle. Massive dilatation of left lateral ventricle, possibly, occurred because of blocked foramina of Monro, on the same side. It is believed that bobble-head doll syndrome is due to the pressure effect of dilated third ventricle on the dorsomedial nucleus of the thalamus, red nucleus and dentatoru-

Figure 1 CT of the brain showing asymmetrical dilatation of the frontal horn of left lateral ventricle with mid-line shift. There is extensive periventricular oedema on the left side. Image is also showing the presence of an external ventricular drainage.

brothalamic pathways. Distortion of the third ventricle is thought to impair the functions of these structures.^{5 6} An evaluation of the cerebrospinal fluid dynamics with CT cisternography also revealed that the head movements were apparently because of intermittent obstruction at the level of foramina of Monro. According to this study, the head movement served to partially relieve intraventricular obstruction by two possible mechanisms (a posterior displacement of the cyst away from the foramina of Monro and a reduction in cyst size).⁷ The disappearance of head movement during sleep is similar to that observed in several other dyskinetic movement disorders, suggesting that anatomical basis of abnormal head movement lie within the extrapyramidal system.¹ Several earlier reports suggested that a marked increase in pressure within the third ventricle, rather than the degree of the dilatation itself, was responsible for the abnormal head movement.⁸ The sole treatment for the bobble-head doll syndrome is surgical. The response to surgical third ventricular decompression is usually excellent.⁹

Learning points

- ▶ The bobble-head doll syndrome is an unusual movement disorder.
- ▶ It is characterised by 'yes-yes' movement of head.
- ▶ Commonly described causes include lesions in the region of the third ventricle.
- ▶ We report a case of this syndrome in a patient with tuberculous meningitis following ventricular drainage.
- ▶ This syndrome in our case was caused by asymmetric dilatation of lateral ventricle.

Competing interests None.

Patient consent Obtained.

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