Post-traumatic transient cortical blindness in a three-year old

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Keywords

post-traumatic, head trauma, cortical blindness

Abstract

Post-traumatic transient cortical blindness after trivial head trauma occurs in rare instances in children and typically resolves in a matter of hours. We present a case of a three-year old girl who presented with a transient but complete loss of vision after a minor fall on her head.

Introduction

Post-traumatic transient cortical blindness (PTTCB) is a documented entity of complete loss of vision that can occur in children after minor head trauma. It has been described in several cases throughout history however it is still poorly known among health-care providers. It is a transient and benign condition but can be very distressing for patients, their family and health-care workers. Here, we describe a case of PTTCB in a three-year old girl and give a summary of cases described throughout history.

Case

A three-year-old girl with no relevant medical history was brought to the emergency department suffering from a complete loss of vision occurring 30 minutes after a minor head trauma. There were no direct witnesses of the trauma itself, although the child could consistently reconstruct what happened, namely a fall on the back of her head after being pushed over by another child. Around 30 minutes after the fall the patient repeatedly exclaimed: 'I can't see anything!'. Neurological examination upon admittance was normal except for a complete bilateral loss of vision. Speech, pupillary reflexes and vital signs were normal. There were no external signs of trauma. Glasgow Come Scale was 15. Urgent MRI scan showed no intracranial hemorrhage, mass or skull fracture. During ophthalmological examination about three hours after the event she slowly regained vision. The patient could identify presented shapes and started to make eye contact. She was admitted to the pediatric department for cardiorespiratory monitoring and neurological observation throughout the night which were uneventful. Neurological examination performed the next day was completely normal, as was a visual-evoked potential test. Thorough ophthalmological evaluation showed a complete recuperation of the patient's vision. She was discharged after 24 hours. Follow-up examination was performed 5 days later and was completely normal. A phone-consultation was performed 2 months after the event which showed no residual signs in our patient.

Discussion

PTTCB following minor head trauma is a known entity and several cases have been described in literature. Bodian et al. first described 6 cases in 1964, since then, over 35 cases have been published in modern literature (1). It is a benign, completely reversible condition that can cause a great amount of stress among patients, parents and caregivers. It occurs most frequently in children. Age of affected patients ranges from 18 months up to 24 years old (2). As the condition can go unnoticed, due to the visual problems being falsely attributed to hysteria and/or post-traumatic confusion or the patient being too young to complain of vision loss, its incidence is most likely understated. Some sources claim an incidence of up to 4.8% in all patients admitted to the emergency department with trivial head trauma, while others place the incidence around 0.4-0.6% (3,4). There is often a delay in occurrence of the blindness after the trauma, ranging from minutes up to an hour. In PTTCB, pupillary reflexes and intracranial imaging are normal. Voluntary eye movements remain intact. Vision loss can be partial and complete recovery is nearly always achieved within a matter of hours, cases of prolonged blindness have however been described (5,6). Weisz et al. published a prospective follow-up study on 4 patients and included repeated ophthalmological, neurological and psychiatric examinations during a 5-year period. All patients had a completely recovery and follow-up visits were uneventful (7). The differential diagnosis of PTTCB includes intracranial hemorrhage, (bilateral) retinal detachment, optic nerve or chiasmal trauma, hysteria and intracranial masses. True cortical blindness can be differentiated from hysteria by using threatening gestures or checking for optokinetic nystagmus, as the latter can't be suppressed voluntarily.

There is much debate about the etiology of PTTCB. Some authors claim a vascular cause, i.e. a vasospasm along the ocular tract, given the sudden onset, brief nature of the condition and the fact that there appears to be an increased incidence of migraine in patients experiencing PTTCB (4). Another possible explanation is a contusion of the occipital brain with secondary focal edema and ischemia. EEGs performed on patients experiencing PTTCB generally show slowing of occipital alpha waves which is consistent with this theory although these EEG findings are also seen in patients with minor head trauma without PTTCB (8). Secondary edema would explain the delay in onset of blindness but this theory fails to explain why some patients experience blindness immediately upon impact (9). It is reasonable to assume that PTTCB would occur most frequently after traumatic impact on the occipital region of the skull, given the function of the occipital lobe, however this is difficult to prove as it can be challenging to determine the exact point of impact in a fall, especially when unwitnessed as in the presented case.

We suggest that every patient with post-traumatic loss of vision be given a complete neurological examination as well as immediate cranial imaging i.e., CT-scan or MRI-scan where possible. Ophthalmological examination should be performed as soon as possible. Referral to a neurosurgeon should be done when in doubt. In the event of complete loss of vision after minor head trauma with an otherwise normal ophthalmological and neurological examination and normal cranial imaging, it is reasonable to

assume PTTCB and to expect a complete recovery within hours. Patients should be monitored for at least 24 hours and frequently checked for signs of raising intracranial pressure or neurological abnormalities. Given the current evidence, there seems to be no need for a systematic long-term follow-up.

Conclusion

Physicians, especially pediatricians and emergency physicians, should be aware of PTTCB and be able to recognize it adeptly. Further research is needed to better understand the pathophysiology of this condition.

Conflict of interest

The authors have no potential, real or perceived conflict of interest to disclose.

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