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Myoclonus following spinal anaesthesia- a case report of a rare complication

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Myoclonus is sudden development of involuntary, repetitive, irregular contractions of a group of muscles. Spinal tumours, infections, vascular lesions can result in spinal myoclonus. It can also be triggered by drugs used in spinal anaesthesia, placement of a subarachnoid catheter and use of contrast. Reports of myoclonus following spinal anesthesia in adults are extremely rare. We encountered a case of myoclonus following spinal anaesthesia which was successfully managed.

Keywords: Myoclonus; side effects of bupivacaine; myoclonus management

Introduction

Myoclonus is sudden development of involuntary, repetitive, irregular contractions of a group of muscles or occasionally of a single muscle triggered by an event within central nervous system.[1,2] Spinal myoclonus can be triggered by drugs used in spinal anaesthesia, placement of a subarachnoid catheter and use of contrast. Other causes include spinal tumours, infections, vascular lesions. The reports of myoclonus following spinal anaesthesia in adults are extremely rare.[3,4] We herein report a case of myoclonus following spinal anaesthesia which was successfully managed.

Case report

An 18 years old healthy female was posted for hernia repair. Pre-anaesthetic assessment, revealed no evidence of any chronic illness or seizure disorder. All pre operative investigations were within normal limits.

At the time of surgery, subarachnoid block was administered in space L3-L4. Bupivacaine heavy (0.5%) 6ml without any adjuvant was administered. Sensory blockade was achieved up to dermatome T_6. Patient remained haemodynamically stable. Approximately 20 min after administration of anaesthesia, she began to experience bilateral, involuntary myoclonic movement of both legs and arms, which was more intense in upper limb. Sensory function in her arms was intact. She was conscious and oriented, 1mg of midazolam was administered intravenously and involuntary movements subsided. Second episode of myoclonus of more severe intensity, reappeared after 15 minutes. Midazolam 2mg i.v. was repeated, simultaneously 0.5mg of oral clonazepam was supplemented. The myoclonic movement diminished slightly, but persisted. Blood sample was immediately sent for serum electrolyte, calcium and blood glucose levels. A neurology consultation was obtained. There was no evidence of weakness or cranial nerve dysfunction. Thus, these movements were clinically defined as spinal myoclonus.

After 2hrs, 1mg midazolam and 0.5mg of clonazepam was repeated. Finally the myoclonic movement disappeared 5hrs after its onset. Serum electrolytes, serum calcium and glucose, were within normal limits. EEG, CT scan and Magnetic resonance imaging was found to be normal.

She was re-examined the following day and no abnormal neurologic finding was evident.

Discussion

Spinal myoclonus is a reaction to a stimulus on a specific area of the spinal cord. The most typical characteristic is that the patient remains conscious and contractions are repetitive, rhythmic and may be synchronous in several muscles. Friedreich in 1881 first suggested that myoclonus could originate in the spinal cord. Lhermitte in 1919 established myoclonus of spinal origin in a case of traumatic transection of the spinal cord.[1]

The pathophysiology of spinal myoclonus seems to be an abnormal hyperactivity of the local dorsal horn interneurons with loss of inhibition of supra-segmental descending pathways usually restricted to a muscle, or a group of muscles.[3] In majority of myoclonus, the pathophysiology is unclear, but there is possibility of abnormalities or deficiencies in neurotransmitter receptors, including serotonin, GABA, opiate, glycine, and dopamine.[2]

Spinal myoclonus appears as stimulus-sensitive. Unlike other forms of myoclonus, it is unaffected by sleep, anaesthesia, or coma. The electroencephalogram remains normal in such myoclonic activity.[4]
The abnormal movements seen in our patient following spinal anaesthesia were limited to both limbs and trunk with preserved sensorium, leading to possibility of spinal myoclonus or psychogenic movement disorder. Psychiatric consultation ruled out the possibility of psychogenic myoclonus. Normal EEG, CT scan and MRI ruled out the possibility of epilepsy.

Local anaesthetics administered through intrathecal route may penetrate into the spinal cord, more towards the postero-lateral cord than in the anterior parts. The effect of the local anaesthetic on inhibitory neurons could have led to loss of inhibitory function in the spinal cord.[2]

Spinal myoclonus following spinal anaesthesia is extremely rare and there are only a few cases in the medical literature. The first case of myoclonus after spinal anaesthesia in the literature was published by Fox et al in 1979 who used neurotoxic local anaesthetic, tetracaine.[2,5] Alfa and Bamgbade described a case of spinal anaesthesia in which the patient developed involuntary spastic movements of both lower limbs three hours after spinal anaesthesia and was successfully treated with the titrated dose of intravenous midazolam.[6] Intrathecal bupivacaine appears to be the most likely cause in this case, because of no seizure history, a normal neurological examination, and follow up imaging. In our case myoclonus subsided in 5 hours. Our patient also had no specific disease history and had unremarkable neurologic and laboratory findings, so the possible cause of spinal myoclonus was intrathecal bupivacaine.

Literature documents that no specific treatment is required in such cases, and patient respond to drugs like clonazepam, sodium valproate, piracetam, levetiracetam, and fluoxetine.[7] Our patient also responded to midazolam and clonazepam.

Few authors have documented re-occurrence of spinal myoclonus but majority believes that it is an unusual and self-limiting adverse event of spinal anaesthesia, and usually resolves after the disappearance of the drug's effect. [8]

Conclusion

In conclusion, anaesthesiologists must be aware of the potential for this very rare phenomenon to occur as a result of spinal anaesthesia. Also, anaesthesiologists should be careful in taking past anaesthetic history of recurrence. But spinal anaesthesia should be avoided in such patients in future surgeries and carefully plan anaesthetic technique for the patients who had previous episode of spinal myoclonus

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