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Opinion

It is wrong to treat pain in CSF hypotension headache (post-lumbar puncture headache) to allow the patient to walk!

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A secondary headache, common in daily practice, is the post-dural puncture headache, which is very frequent in spinal anesthesia. Some patients in the immediate postoperative period, when he or she got out of bed, report the appearance of pain of moderate to severe intensity that improves when he or she returns to the lying position.[1-3] Valença and coworkers[2], in an experiment with fragments of human dura mater obtained from cadaver donors of both sexes, evaluated why women are more susceptible than men to development post-dural puncture headache (PDPH). The experiment demonstrated that the dura mater has mechanisms that provide spontaneous occlusion of the orifice caused by the entrance of the needle, even when placed isolated and fixed an acrylic apparatus simulating the human spine in the vertical position, under the pressure of 40 cm H_2O. This particularity observed in cadaver dura mater varies between individuals and also between different parts of the dura mater of the same individual. This may explain why some individuals have post-dural puncture headache and others do not. The experimental data revealed that dura mater fragments obtained from women leaked more fluid, and the orifice remained opened longer when punctured when compared with men.

The triggering of pain during biological events that have the potential to be life-threatening is a crucial mechanism that is often overlooked. Numerous published articles are bringing different alternatives in an attempt to treat a postural headache that is pathognomonic of cerebrospinal fluid (CSF) hypotension (Table 1).[4-23] Even so, one of the most used drugs to prevent and treat post-lumbar puncture headache, caffeine, had its analgesic action questioned in a publication of notable reputation due to being insufficiently supported by the available pharmacological and clinical proofs.[24]

From a practical point of view, it is worth remembering that normal CSF pressure is not uncommon in patients with spontaneous intracranial hypotension and, thus, the lack of a low opening pressure does not exclude this condition.[25] And spontaneous intracranial hypotension may be encountered in patients with new-onset daily persistent headache.[26]

There are several causes of CSF hypotension,[27-36] the most frequent after the spinal anesthesia procedure.[37]

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In the intracranial space, there are three compartments: CSF, brain parenchyma, and blood. With the exception of the brain parenchyma, which is practically inelastic, there is a considerable variation during the cardiac cycle in the volumes of CSF and blood. These intracranial volumes maintain an inversely directional relationship. When there is an increase in the intracranial volume of blood, the CSF must leave the cavity towards the spinal dural sac to allow blood to enter the intracranial cavity. Cerebrospinal fluid leaves and enters through the foramen magnum about 70 times per minute in a resting individual.

Table 1. Treatment alternatives in post-dural puncture headache.

Modified sphenopalatine ganglion block[4,8]
Sphenopalatine block with lidocaine spray[6]
Intranasal lidocaine atomization[5]
Epidural blood patch[38-53]
Synacthen depot[15]
Caffeine[14,23,24]
Sumatriptan[9,20,22]
Naratriptan[9]
Aminophylline/Theophylline[10]
Piritramid[12]
Ergotamine[14]
Gabapentin[14]
Tramadol[11]
Paracetamol[12]
Cosyntropin[7,18,21]
Tetracosactin[16]

In a reduced volume of the CSF, in the case of fistula with loss of CSF, the pain is caused by the exit of the CSF from the intracranial space into the spinal dural sac. In order to keep the intracranial volume constant with the three mentioned compartments (i.e., brain parenchyma, CSF, and blood), there is vasodilation, mainly of the venous sinuses and large veins, as these vessels are quite innervated, the individual feels an intense headache when raising the head in relation to the trunk. By the force of gravity, this position facilitates the exit of the already reduced volume of CSF from the intracranial cavity to the dural sac. Another explanation for postural headache is the descent of the cerebellar tonsils through the foramen magnum, as in the case of a secondary Chiari,[54] if that name is correct for this diagnosis.

Cerebrospinal fluid hypotension due to a reduced volume of CSF, as in the example of a fistula, can precipitate complications such as bleeding in the subdural space. It is not uncommon for chronic subdural hematomas to appear after the patient has undergone spinal anesthesia or after a lumbar puncture with CSF removal.[55] Cerebrospinal fluid hypotension may be a cause of cortical vein thrombosis.[56] In addition, cerebellar hemorrhage may also be found as a manifestation of spontaneous intracranial hypotension.[26]

The authors, therefore, is not against the treatment of post--dural puncture headache or the headache associated with cerebrospinal fluid hypotension from other causes as long as it treats the cause of cerebrospinal fluid fistula, as in the example of epidural blood patch.[39-44, 57] Also, remember that epidural blood patch is not an uncomplicated procedure (e.g., arachnoiditis, seizures and respiratory distress, pneumocephalus, intracranial subarachnoid hemorrhage, hydrocephalus, local infection and sepsis complication, and spinal subdural hematoma)[38, 45-51] and should be planned and indicated when conservative measures, including rest in the horizontal position and hydration, have failed.[12, 52, 57] In most cases, the headache disappears within a week.[1] In the case of prolonged horizontal decubitus, measures to prevent deep venous thrombosis should be taken. Other forms of CSF fistula treatment have also been published.[53, 58-61]

Thus, we conclude that it is wrong to treat pain in patients with the postural headache associated with a CSF hypotension with the intention to allow the patient to walk because it favors the occurrence of intracranial complications that can lead to the patient's death. The pain makes the patient remain in the horizontal decubitus and, in this way, avoids the exit of the CSF to the spinal dural sac, causing a substantial intracranial hemodynamic disturbance with hemorrhagic or thrombotic repercussions.

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