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Editorial

Post-dural puncture headache

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Post-lumbar puncture headache due to cerebrospinal fluid (CSF) leak remains a problem in clinical practice.[1,2] Patients who develop a headache after a dural puncture have typical characteristics, such as worsening pain when raising the trunk with the head (e.g., sitting or standing position), with improvement when returning to the horizontal position.

In an analytic, interventional, cross-sectional study, we evaluated the risk factors of post-dural puncture headache in 640 patients (332 non-pregnant women) aged 8-65 years.[3] All patients underwent spinal anesthesia with Quincke 25G or 27G needles in elective surgery.[3] Forty-eight of the subjects (7.5%) developed post-dural puncture headache. Using binary logistic regression analysis, we identified as risk factors: sex [11.1% female vs. 3.6% male, OR 2.25 (1.07-4.73)], age [11.0% 31-50 years of age vs. 4.2% others, OR 2.21 (1.12-4.36)], and bevel orientation [16.1% perpendicular vs. 5.7% parallel, OR 2.16 (1.07-4.35)].[3] The latency period between lumbar puncture and headache onset ranged from 6 to 72 hours and the headache lasted from 3 to 15 days.[3] In 71% of the patients with post-dural puncture headache, at least one of the following was present: neck stiffness, tinnitus, hypoacusia, photophobia, or nausea.[3] However, 29% of the subjects suffered none of those mentioned above symptoms, indicating that many patients may suffer from post-dural puncture headache in the absence of any symptoms apart from the headache itself.[3]

Post-dural puncture headache is a preventable complication of the CSF withdrawal method.[3-6] The choice of a needle to puncture the subarachnoid space and the needle gauge are related to the frequency of cerebrospinal fluid hypotension due to CSF leakage through the orifice of the dura mater and arachnoid membrane.[3,7] Domingues and colleagues[8] published an interesting study comparing two types of needles used to perform a lumbar puncture: (1) pencil point and (2) Quincke. Their results indicate that selecting a particular type of needle may be a strategy to avoid or diminish the chance of post-dural puncture headache. The percentage of post-dural puncture headache in the pencil point needle group was 1.4% versus 3.2% in the Quincke group. However, when using methods with less risk of headache after dural puncture, the financial costs are higher, and there is greater technical difficulty in performing the puncture properly.

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In another investigation,[5] we studied patients with a previous history of post-dural puncture headache to know whether they might be prone to a new episode after spinal anesthesia. Of 42 patients with a previous history of post-dural puncture headache, eight (19%) developed a new post-dural puncture headache episode, whereas out of 216 without an earlier history, only 15 (6.9%) presented with post-dural puncture headache.[5] Previous post-dural puncture headache history indicates a higher chance of a new episode of post-dural puncture headache after spinal anesthesia and women were more susceptible to such recurrences.[5] For these patients with a previous history of post-dural puncture headache, we must try to avoid a new episode, either by avoiding a new spinal anesthesia or by using needles with a smaller gauge and with a design that is less likely to damage the dura mater.

We also investigated in the laboratory why women would have a higher frequency of post-dural puncture headache than men, using dura mater from adult human cadavers.[4] The dura mater fragments were fixed and perforated with needles used during spinal anesthesia, utilizing an acrylic apparatus filled with liquid simulating a vertebral dural sac full of CSF.[4] Interestingly, the liquid leakage through the dura mater orifice was auto-limited. Thus, the dura mater placed ex-vivo, when perforated, lets leak to the external surface, and this leak is self-limited.[4] There appears to be a self-healing mechanism regarding the orifice, at least in this ex-vivo model. Leakage was more significant in dura mater fragments obtained from female cadavers, and liquid passed through the orifice for a more extended period in dura mater samples obtained from female specimens, compared to males.

Furthermore, patients with CSF hypotension due to a lumbar puncture can develop serious complications, such as an intracranial subdural hematoma, with consequences that can lead to death.[9]

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References

1. Li H, Wang Y, Oprea AD and Li J. **Postdural Puncture Headache-Risks and Current Treatment.** *Curr Pain Headache Rep* 2022;26(6):441-452 Doi: 10.1007/s11916-022-01041-x
2. Kuczkowski KM. **Postdural puncture headache after lumbar puncture: do the gauge and the design of a spinal needle matter?** *Am J Emerg Med* 2006;24(6):757 Doi: 10.1016/j.ajem.2006.01.018
3. Amorim JA, Gomes de Barros MV and Valenca MM. **Post-dural (post-lumbar) puncture headache: risk factors and clinical features**. *Cephalalgia* 2012;32(12):916-923 Doi: 10.1177/0333102412453951
4. Valenca MM, Amorim JA and Moura TP. **Why don't all individuals who undergo dura mater/arachnoid puncture develop postdural puncture headache?** *Anesth Pain Med* 2012;1(3):207-209 Doi: 10.5812/kowsar.22287523.3616
5. Amorim JA and Valenca MM. **Postdural puncture headache is a risk factor for new postdural puncture headache.** *Cephalalgia* 2008;28(1):5-8 Doi: 10.1111/j.1468-2982.2007.01454.x
6. Gulizia S, D'Amico E, Patti F and Zappia M. **Spinal needle and post-dural puncture headache.** *Neurol Sci* 2022;43(2):1467-1468 Doi: 10.1007/s10072-021-05745-7
7. Wang LP and Schmidt JF. **Central nervous side effects after lumbar puncture. A review of the possible pathogenesis of the syndrome of postdural puncture headache and associated symptoms.** *Dan Med Bull* 1997;44(1):79-81
8. Domingues R, Giafferi C, Vega M, Salomão D and Senne C. **Needle caliber and design are associated with the risk of post-dural puncture headache after diagnostic lumbar puncture.** *Headache Medicine* 2023;14(1). Doi: 10.48208/HeadacheMed.2023.7
9. Amorim JA, Remigio DS, Damazio Filho O, de Barros MA, Carvalho VN and Valenca MM. **Intracranial subdural hematoma post-spinal anesthesia: report of two cases and review of 33 cases in the literature.** *Rev Bras Anestesiol* 2010;60(6):620-629, 344-629 Doi: 10.1016/S0034-7094(10)70077-5