Sphenopalatine Ganglion Block As An Alternative Treatment For Post Punction Dural Headache

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Introduction

Post-dural puncture headache (CPPD) is a common complication after subarachnoid block and its incidence varies according to the size and design of the needle used, however it is important to note that SPGB can attenuate the cerebral vasodilation induced by parasympathetic stimulation transmitted through of neurons that have synapses in the sphenopalatine ganglion. This would explain why caffeine and sumatriptan may have an effect on the treatment of post dural puncture headache.

Keywords: Sphenopalatine ganglion block; Postdural puncture headache; Treatment for postdural puncture headache.

Introduction

The sphenopalatine ganglion also known as Meckel's ganglion, pterygopalatine ganglion or sphenomaxillary ganglion is the largest of the extracranial parasympathetic ganglia, it does not have a sensory function and is anatomically related to multiple structures and facial and trigeminal nerve connections, intervening in the genesis and maintenance of atypical facial pain and some unilateral headaches. Postdural puncture headache is usually a clear diagnosis of a history of central venous meningithrombosis or a history of migraine. The appearance and lack of progression of neurological symptoms can lead to other diagnoses such as meningitis or intracranial hemorrhage, probably taking into account more dramatic characteristics.

After a dural puncture, if there is a leakage of cerebrospinal fluid, the other intracranial components (blood and brain tissue) increase in volume so that the intracranial pressure and the cerebral perfusion pressure remain in the normal range. Since brain tissue is a solid component with a low capacity to expand its volume acutely, the remaining possibility is that intracranial blood volume increases and clinical findings, this disturbance of neurological balance causes the appearance of pain of mild intensity to moderate to which we call headaches and in turn it is believed that the nerve connections that originate or pass through the sphenopalatine ganglion are disturbed, which makes these headaches have an atypical component of facial pain.

Materials and Methods

A detailed bibliographic search of information published since 2017 is carried out in the databases PubMed, Elsevier, SciELO, Update, Medline, national and international libraries. We use the following descriptors: sphenopalatine ganglion block, postdural puncture headache, treatment for postdural puncture headache. The data obtained oscillate between 5 and 15 records after the use of the different keywords. The search for articles was carried out in Spanish and English, it was limited by year of publication and studies published since 2017 were used.

Results

There is a general belief that the cause of post-dural puncture headache when using Quincke-type needles is the size of the lesion; but in reality, it is more due to the cut produced in the dura-arachnoid surface [1].

Reina found that Quincke and Whitacre needles produce dura lesions of different morphology and characteristics. Those caused by the Quincke needle result in an opening with a clean cut in the dura, while the Whitacre produces a more traumatic opening, with tearing and severe disruption of the collagen fibers. The conclusion is that the lower incidence of CPPD with the Whitacre needle would be explained, in part, by the inflammatory reaction produced by the tear of the collagen fibers during puncture, which can cause significant edema that acts as a plug limiting loss of CSF and thus decreasing the presentation of CPPD [2].

Some studies were carried out in the context of maintaining the intrathecal or epidural catheter in search of benefits of administration of different solutions; For example, dextran has been used due to a slow elimination of the epidural space, with increased pressure in the transient subarachnoid space. However, there is not enough evidence to use it, although there are reports of efficiency of up to 70%. On the other hand, cases of neurotoxicity and anaphylaxis have been evidenced in humans [3].

Quincke's needle is one of the most widely used spinal needles in the world and has a sharp, cutting point. The incidence of CPPD with Quincke needles can range from 0.4% to 36%, depending on their size. Pencil tip needles may have a lower incidence of PDHP. Rehydration, non-steroidal anti-inflammatory drugs, acetaminophen, low-dose corticosteroids, caffeine, and even sumatriptan are part of supportive therapy that can obviate the need for more aggressive therapy despite incomplete relief [4]. EBP is currently the standard of care after failure of pharmacological therapies, but it is not without significant risks (meningitis, seizures, motor, and sensory deficits, etc.). Some reports have emerged of transnasal SPGB for the treatment of CPPD [5].

Discussion

The sphenopalatine ganglion (SPGF), also called the sphenomaxillary ganglion, is recognized as an ovoid collection of postganglionic parasympathetic cells. It constitutes 1 of the 4 parasympathetic ganglia of the head, together with the otic, ciliary, and submandibular ganglion. Located posterior to the middle turbinate, surrounded by a layer of mucosa. Specifically, in the pterygomaxillary fossa. This location allows it to be blocked typically trans nasally [6]. The pterygomaxillary fossa can be considered anatomically an important junction in which nerve endings from the ocular orbit, the nasal cavity, the middle cranial fossa, the pharynx, the torn foramen, and the infratemporal fossa communicate [7].

Blocking nerve structures with local anesthetics for the treatment and diagnosis of pain is based on the property of local anesthetics to selectively block sensory fibers in mixed nerves, at low concentrations. The duration of the block will depend on the dose and the pharmacokinetic properties of the anesthetic used. Relief is often longer than the expected duration of the anesthetic block [8].

When considering the blockade of the sphenopalatine ganglion as a treatment for the appearance of post-dural puncture headache, reference is made to an interventional method that aims to reverse the inflammatory and algic processes that are triggered after the alteration of the nervous balance that by parasympathetic mechanisms give way to the installation of headaches and neurovascular alterations [9]. It is important to perform a previous block to discern if GEFP is involved in the genesis or maintenance of facial pain or headache. However, the great importance of injections in the placebo effect must be taken into account [10].

Many interventionists add depot corticosteroid (generally triamcinolone) to the anesthetic block, although no benefit has been demonstrated with the addition of corticosteroid to the local anesthetic [11]. The mechanism of action by which intranasal lidocaine relieves cranial pain is not fully explained, although it appears to be due to the reversal of the parasympathetic contribution to intracranial vasodilation produced by blocking GEFP [12].

Three GEFP blocking techniques have been described: transnasal technique, transoral technique, and infrazygomatic technique:

1.   Transnasal technique: It is the simplest and best tolerated of the three techniques [13]. Since the GEFP is located close to the mucosa of the middle turbinate, the transnasal route allows it to be easily blocked. It was Sluder who described this technique with topical cocaine in 1908 [14]. He later described the phenol technique using a transnasal needle [15]. The use of this technique can be done with the help of a rhino scope or by direct endoscopic vision [16]. It can be done simply with a swab soaked in local anesthetic [17]. The main problem is that the diffusion of the anesthetic is not uniform or predictable, even if the swab is properly positioned close to the mucosa covering the GEFP. Ideally, do it with 5% lidocaine or 2% lidocaine paste. The swab is left for 20-30 minutes, being able

to repeat a couple more times. The patient can be instructed to do it at home. Modifications to the technique have been described, such as that described by Yang and Oraee, which after anesthetizing the mucosa with the swab, anesthetize the transmucosal ganglion with an ingenious system consisting of a spinal needle protected with its sheath. Another modification is the one described by indsor and Jancke [18], with another novel applicator to administer the desired dose of the local anesthetic in the peri ganglionic mucosa. The benefits provided by this modification of the technique are comfort and control of the administered dose, improving safety and results.

2.   Transoral technique: It consists of accessing the GEFP through the palatine hole, located in the hard palate of the oral cavity. It is the access route to the Palatine Nerves used by dentists or stomatologists. It is not usually used for ablative techniques but can be used to perform ganglion blocks [19].

3.   Infrazygomatic technique: It is the most frequently used to perform the blockade and radiofrequency of the GEFP. It is described in the following section, the technique being the same as for radiofrequency, but administering local anesthetic with or without corticosteroid [20].

Conclusion

Currently, sphenopalatine ganglion blockade is spoken of as the new treatment for post-dural puncture headache, however there is no pathophysiological evidence that confirms that in all cases GEFP is related to the manifestations and development of headache, so there are still prospects for analyze and more information to document and analyze before establishing this innovative interventional technique as a timely treatment option.

Conflict of Interest

None.

Acknowledgement

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