A Novel NAG (Nerve And Ganglion) Dual Block For PDPH: An Observational Study In Seven Patients Of Refractory Post Dural Puncture Headache (PDPH) Using Combined Greater Occipital Nerve (GON) And Sphenopalatine Ganglion (SPG) Blocks

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Abstract

Objective: Managing Post Dural Puncture Headache (PDPH) is a challenge for most anesthesiologists as the gold standard, epidural blood patch (EBP) itself can lead to Dural Puncture that caused the complication in the first place. Medical management of PDPH may not provide symptomatic relief and anesthesiologists are on a constant lookout for techniques that can provide instant and sustained relief from this debilitating complication. Sphenopalatine Ganglion (SPG) and Greater Occipital Nerve (GON) Block have been used individually to manage PDPH in a selected number of patients. For the first time in the literature, we propose the use of a less invasive and acceptable technique using both these blocks (combined nerve and ganglion block) in the same patient to provide higher success rates. The hypothesis for this NAG Dual Block is because both these blocks act on two important but different paths in the pathogenesis of PDPH. In this case series, we describe our experience in 7 patients with PDPH who consented for the dual block.

Case Series: We describe the successful use of NAG dual block in seven patients with PDPH who had immediate and sustained relief. The patients were followed up for up to 48hrs.

Conclusions: We recommend combining both the blocks that are less invasive than EBP for managing PDPH. The Superiority of this new technique will need more data either by RCTs or larger case series. Along with ongoing supportive medical management, both these blocks can be offered as a rescue to all patients diagnosed with moderate to severe PDPH.

Keyword: NAG (Nerve And Ganglion), Post Dural Puncture Headache (PDPH), Greater Occipital Nerve (GON), Sphenopalatine Ganglion (SPG).

Introduction

Management of Post Dural Puncture Headache (PDPH) has always been challenging for anesthesiologists. PDPH not only increases the misery of the patient, but it also prevents bonding with the newborn and increases the length of stay. Economically, it increases the overall cost of treatment. Although the Epidural Blood Patch (EBP) is considered the gold standard and an effective way of managing the problem, the procedure can itself lead to an inadvertent Dural Puncture (DP). In recent years, Sphenopalatine Ganglion Block [1] or Greater Occipital Nerve Block [2] have been individually used successfully to manage PDPH in a selected number of patients. For the first time in the literature, we propose the use of both these blocks (combined nerve and ganglion block) in the same patient providing higher success. The hypothesis for this NAG Dual Block is because both these blocks act on two important but different paths in the pathogenesis of PDPH. Further prospective studies will be able to establish the efficacy and effectiveness of NAG dual blocks. Patients would be greatly benefited by this lesser invasive technique due to early recovery and lesser suffering. In this case series, we describe our experience in 7 patients with PDPH who consented for the dualblock.

Case Series

Methodology

Over the last two years, we observed 7 patients with PDPH after accidental Dural Puncture. Following failed conservative therapy in these 7 patients, we provided...
options of combined Greater Occipital Nerve Block (GONB) and Sphenopalatine Ganglion Block (SPB) i.e. NAG dual block or Epidural Blood Patch (EBP) to these patients. All the 7 patients opted for the dual block which would be followed by EBP in case of failure of treatment. Neurologist’s opinion was sought in all the 7 patients to rule out any other cause for the headache. Patients with any neurological deficit would be excluded from the treatment. Patients have explained the procedure in details and informed verbal consent for the dual blocks was obtained.

Block Description
The blocks were performed bilaterally in all the patients. Single anesthetist (1st author) performed all the blocks maintaining uniformity of technique. In all cases, minimum standard monitoring was established, and intravenous access obtained before performing the block under aseptic conditions.

Greater Occipital Nerve (GON) Block
The Patient is positioned prone with a pillow under the chest. Occipital protuberance and mastoid process are marked. A line is drawn connecting the two points. The connecting line is then divided into three parts. The junction of medial 1/3 with the lateral 2/3 corresponds to the point where the GON is blocked (junction of medial 2/3 and lateral 1/3 corresponds to the lesser occipital nerve). 2ml of 0.25% Bupivacaine mixed with 2ml of 2% preservative-free lignocaine was mixed to be used as the local anaesthetics. 1-1.5 ml of this was injected bilaterally at GON landmark after palpating a greater occipital artery and injected just medial to it after careful aspiration. Ultrasound assistance was taken if arterial pulsation was not appreciated. The Patient was monitored for 5mins in the same position before turning supine to look for any swelling or hematoma at the site of injection.

Sphenopalatine ganglion (SPG) block
Patient lies supine with a pillow placed under the scapular area so that the neck is extended providing sniffing position. A gauge piece soaked with 4% lignocaine 2ml is gently inserted into each nostril till it meets resistance. Another 0.5 ml of 4% lignocaine is trickled using a syringe and cannula until the patient feels the drug dripping at the back of the throat. Patient is then maintained in this position for 10 minutes and the nasal packs are removed. Patient is monitored throughout the procedure.

The local site of the greater occipital nerve block done earlier is again examined for any swelling and hematoma and the nasal passage is examined for any bleed. Patient is monitored for an hour before allowing them to walk to assess the persistence of the symptoms. Inpatients were sent back to the ward after about 2 hours and the outpatients were discharged in similar time scales. All patients were prescribed a combination of Paracetamol 650mg and Caffeine 35mg to be taken regularly three times a day for a further 3 days. They were followed up on phone after 24hrs and at 48hrs. An outpatient visit was arranged after one week to assess for any side effects and recurrence of headache. Further, follow-ups were done on phone thereafter.

Results
All the 7 patients received both bilateral SPB and GONB (Table-1). Monitored for one hour for any side effects in the hospital. Pain and other symptoms (nausea, vomiting, photophobia) started subsiding within 10 minutes of administration of the block in all the patients. By the time of discharge or...
fibers [6] and GONB decreases this noxious signal maintaining this tonic inhibition. Since the first case has been reported on the successful treatment of PDPH with a greater occipital nerve block (GONB) [7], several other PDPH patients from different institutes were presented after treatment with GONB [8].

Another hypothesis for PDPH is cerebral vasodilatation is responsible for the excruciating headache after a Dural Puncture. One of the contributors to this vasodilatation is mediated by parasympathetic activity by the neurons which have synapses in the SPG. This is how an SPG block helps in alleviating the headache that is mediated by the neurons in the SPG [9]. Intranasal lidocaine administration anesthetizes the sphenopalatine ganglion and decreases the nociceptor signaling, which relieves the PDPH [10]. CSF leakage although considered as a main cause but it is still unclear as the cause, physiologically, the CSF loss is rapidly compensated by rapid turnover. Challenges to epidural blood patch (EFP) exist as it has absolute and relative contraindications; persistent pain despite EBP, high complication rates. Sealing mechanism is still controversial as evidenced by EBP done at a lumbar level providing relief for PDPH from the cervical tap [11]. In one of our patients (no.5 table-1) who suffered two dural punctures with 16G Tuohy needle, the holes were found sealed with no signs of low ICP after 4 days on MRI scan, suggesting self sealing.

Conclusion
We for the first time propose utilizing combined bilaterally GONB and SPB (NAG DUAL BLOCK) instead of doing just one of them. The dual block targets the different important steps in the pathogenesis of PDPH providing much higher success rate compared to utilizing the individual blocks. They appear to be simple, minimally invasive blocks that can be done as bedside procedures. If successful, invasive procedure like EBP does not need to be done despite it being an established modality with a high success rate for managing PDPH. The data on doing these blocks individually for PDPH is scarce now and there is no data on combined blocks yet. Publications on the efficacy of the SPB and GONB individually by several approaches for headaches of varied etiology have proven their worth. We recommend combining both the blocks that are less invasive than EB for managing PDPH. Before declaring the superiority of the NAG dual block over the time tested EB, we need to have more data on successfully treated patients. After reviewing the available literature, it appears that we should routinely offer both the blocks to all patients diagnosed treated patients. After reviewing the available literature, it appears that we should routinely offer both the blocks to all patients diagnosed with moderate to severe PDPH before an invasive procedure like EBP. If the NAG dual block is ineffective in alleviating pain, EBP can then be offered to the patient. Clinicians should continue ongoing supportive medical management after performing the blocks.
References


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