**Trigeminal neuralgia in pregnancy - A Management Challenge**

Abstract

Pregnancy is known to aggravate preexisting chronic painful conditions. Trigeminal neuralgia (TN), albeit a disease of elderly may afflict pregnant females which can further complicate its management. Teratogenic effects of the commonly used drugs on the developing fetus limits pharmacological treatment. Moreover safety of interventional therapies in pregnancy is marred by lack of literature support. This rare coexistence of TN in pregnancy is never reported before. Here, we report a case of trigeminal neuralgia in a young woman, whose pain aggravated when she became pregnant and was managed successfully by conventional radiofrequency ablation of Gasserian ganglion.

Key words: Trigeminal Neuralgia, Pregnancy, Radiofrequency ablation.

Introduction

Trigeminal neuralgia, rarely afflicts young people and it's coexistence with pregnant females is uncommon. Studies have found that pregnancy can aggravate pre-existing chronic painful diseases [1]. However implications of pregnancy on trigeminal neuralgia (TN) is largely unknown. When a patient of trigeminal neuralgia becomes pregnant or develops it during her pregnancy, the management gets complicated because of the limitation of therapeutic measures currently available. It is because of the potential risk of teratogenic effects of commonly used pharmacological agents on the fetus and lack of evidence regarding the safety of interventional procedures employed for pain relief.

Case Report

A 25 years female, 10 weeks pregnant, was referred to our pain clinic with paroxysmal electric shock like pain in her right side of face. Her pain was extending from the ear to the lower jaw along the dermatomal distribution of mandibular nerve. The pain aggravated on chewing food or sometimes even touching the affected area. She was diagnosed with trigeminal neuralgia two years back and was well controlled with carbamazepine 400 mg, till she conceived. Her pain intensity and frequency steadily increased during her pregnancy. She continued to take carbamazepine and kept on escalating the dose as a desperate measure to control pain till she visited us. She was in severe agony with visual analogue scale (VAS) 9 out of 10 and in depression with Patient Health Questionnaire-9 (PHQ-9) score of 15. On examination there was allodynia and hyperalgesia over the affected side.

We immediately stopped carbamazepine and kept her on simple analgesics (paracetamol 500mg 6 hourly and tramadol 37.5mg 6 hourly) on the first visit. We reviewed her previous MRI scan brain and angiogram to rule out any intracerebral pathology. As she pain did not respond to the analgesics and only the mandibular division was involved, we did a percutaneous diagnostic mandibular nerve block with 5 ml of 2% lignocaine using peripheral nerve simulator (PNS). She had good pain relief for about 24 hours but her pain reappeared, though the intensity was lesser than before. But she was still unable to tolerate the pain (VAS 6-7/10) and was refusing to eat as chewing aggravated the pain to a severe degree. Considering the fact that she was pregnant and her nutritional requirements were severely compromised, a decision was taken to perform percutaneous radiofrequency ablation of trigeminal ganglion once she reached the second trimester. The procedure was done once the patient crossed 13 weeks of pregnancy.

Before the procedure we reviewed her investigations and obtained informed consent from the patient explaining the risks and benefits. Then she was taken to operation theatre and positioned supine with slight extension of head (fig. 1). Standard monitors were attached, IV line secured and prophylactic antibiotic administered. To prevent radiation exposure to the fetus, patient was covered with two layers of lead suit from upper chest to mid-thigh both above and below the patient. The fluoroscope was positioned in such a manner so as to get a submental view and foremen ovale (FO) was visualized by maneuvering it obliquely towards the ipsilateral side (fig. 2). Then a 10 cm radiofrequency ablator needle with 5 mm active tip was directed towards the lateral edge of the foramen ovale after anaesthetising the skin entry point with 2% lignocaine. Once the needle entered the FO, lateral fluroscopic view was obtained and needle was positioned near the angle formed by the clivus and petrous ridge of the temporal bone (fig. 3). Proper position of the needle was confirmed by eliciting paresthesia along the distribution of the mandibular nerve on sensory stimulation at 50 Hz in 0.2-0.5 mV current and jaw movement on motor stimulation at 2 Hz in 0.5 mV current (Cosman Medical Inc., Burlington, Massachusetts,USA). Then we injected 2 ml of 2% lignocaine, so as to anaesthetise the target area and went on with 4 cycles of conventional RF lesioning at 70 degree Celsius for 60 seconds each. In order to prevent neuritis we injected 4 mg of dexamethasone through the same needle after the lesioning. Post procedure there was immediate reduction in pain score from VAS 8 to 3 and patient was discharged home. Meanwhile she had an anomaly ultrasound scan done to rule out any foetal malformation as she was on carbamazepine in most part of her 1st trimester before she visited us. At the time of writing this case report, she is in her late 3rd trimester, on regular follow-up with an obstetrician and is absolutely pain free.

Discussion

Trigeminal neuralgia is one of the worst facial pain described in view of its disabling and debilitating effects. It mostly affects elderly population with prevalence slightly skewed towards females (F:M::1.5:1) [2]. It is quite uncommon in people younger than 30 years of age and in younger patients it is notoriously resistant to treatment in comparison to older population [3]. Morever when a young woman of TN becomes pregnant or develops it during her pregnancy, the challenges in management increases manifold. It is still unknown whether pregnancy has got any impact on pre-existing TN but it certainly handicaps the treating physician in terms of therapeutic measures. Teratogenic effects of commonly used medications (carbamazepine, pregabalin, gabapentin etc.) on foetus limits pharmacological therapy [4]. Several metanalysis have clearly found that carbamazepine, the first line therapy of TN has a significant teratogenic potential [5] and is labeled as a category-D drug by U.S. FDA (Food and Drug Administration) [6]. So, when pregnancy is suspected, it is wise to discontinue these medications and try to optimise the patient on non-pharmacological treatment. For acute control of pain, drugs like paracetamol (Category B) and opioids (Category C) are sometimes used. However safety of these drugs especially opioids are questionable in pregnancy. If at all it is used it has to be beyond the 1st trimester pregnancy [7]. In the present case unfortunately the patient was on carbamazepine during most part of her first trimester due to lack of awareness. The drug was immediately withheld on her first visit to our pain clinic and interventional therapy was planned.

There are several interventional therapies currently available for TN, which can be either surgical or percutaneous interventions [8] [9][10] [11][12]. In pregnancy, surgical intervention is probably the least preferred option, whereas percutaneous interventions can be handful in these situations. One of the most common percutaneous interventional procedure preferred in TN is the radiofrequency (RF) ablation of the Gasserian ganglion. However there are two important points to consider when you are performing this procedure in a pregnant patient. The first one is the risk of radiation exposure to the foetus due to the use of the fluoroscopy. It has been found that the foetus is most sensitive to radiation effects between 8 to 15 weeks of gestation. However by limiting fluroscopy time, using lead shield and by avoiding the procedure till 15 weeks of pregnancy we can minimise the deleterious effect of radiation on foetus [13]. In this patient the intervention was performed in the 13th week of pregnancy. This decision was taken because the pain was debilitating for the patient and was adversely effecting her nutritional requirements and also her emotional well-being. However adequate precautions for protection from exposure to radiation were taken. The second important point is the specific considerations of radiofrequency ablation in pregnant woman, like its effects on developing fetus, utero-placental circulation and precipitation of labor. Unfortunately there is no literature on it's use for the treatment of TN in pregnancy. But it has been used in pregnancy for other indications like ablation of intramural fibroid, aberrant cardiac conduction pathway and was found to be safe [14] [15].

In our case, we performed percutaneous mandibular nerve block using PNS before radiofrequency ablation of gasserian ganglion. The aim was to bring down the pain without exposing the foetus to radiation in the vulnerable phase of the first trimester, before going for a more invasive procedure (RF ablation of Gasserian ganglion) later in the second trimester.

Several case reports suggest use of mandibular nerve block to control pain in patients suffering from TN, orofacial cancer and fracture mandible [16] [17][18]. Traditionally it is done by eliciting paresthesia but nerve stimulation can be used targeting jaw jerk as end point. This will not only improve accuracy but also possibly reduce the risk of intravascular and intraneural placement [19]

However peripheral nerve blocks like mandibular nerve block is found to be less effective than central ganglion level procedures. Peripheral blocks should be reserved for emergency scenarios and in patients where other procedures unsuitable [20]. Therefore we did this procedure in the first trimester in this patient.

We decided to do Gasserian ganglion radiofrequency ablation to provide long term pain relief. This technique was well studied by various authors and found to be highly effective with minimal complications [21] [22]. We didn't encounter any complications or side effects neither during the procedure nor within two months of follow up after the procedure.

Conclusion

If you take a look in to the current literature, you will find abundance of studies about trigeminal neuralgia, however there are hardly any focussing on it's association with pregnancy. This is a unique situation which needs more comprehensive and humanised approach in management, bearing in mind the implications on mother and the foetus. Most importantly pharmacological therapy, the mainstay of which is carbamazepine, should be immediately discontinued once pregnancy is diagnosed and alternate non-pharmacological therapeutic option should be explored depending upon the availability and expertise.

In this case we demonstrated that RF ablation of Gasserian ganglion can be a safe and effective technique in managing pain of TN in pregnancy.

References

Roberto Díaz R, Lopera Rivera A. Manejo del dolor no obstétrico durante el embarazo. Artículo de revisión.Rev Colomb Anestesiol 2012;40:213–23

1. Rozen TD. Trigeminal neuralgia and glossopharyngeal neuralgia.Neurol Clin. 2004;22:185–206.
2. Bahgat D, Ray DK, Raslan AM, McCartney S, Burchiel KJ.Trigeminal neuralgia in young adults.J Neurosurg 114:1306–1311, 2011
3. Hill DS, Wlodarczyk BJ, Palacios AM, Finnell RH. Teratogeniceffects of antiepileptic drugs. Expert Rev Neurother.2010;10:943–59
4. Vajda FJE et al. Is carbamazepine a human teratogen? J Clin Neurosci (2015)
5. U.S. Food and Drug Administration.Pregnancy and Lactation Labeling (Drugs) Final Rule <https://www.fda.gov:80/FDAgov/Drugs/DevelopmentApprovalProcess/DevelopmentResources/Labeling/ucm093307.htm>, 2014
6. Kennedy D. Analgesics and pain relief in pregnancy and breast feeding. Aust Prescr 2011;34:10
7. Janetta P. Trigeminal neuralgia: treatment by microvascular decompression. In: Wilkins R, Regachary S, eds. Neurosurgery. New York:McGrawy-Hill; 1996:3961–3968.13.
8. Young RF, Vermulen S, Posewitz A. Gamma knife radiosurgery forthe treatment of trigeminal neuralgia. Stereotact Funct Neurosurg.1998;70(suppl 1):192–199.14
9. Mullan S, Lichtor T. Percutaneous microcompression of thetrigeminal ganglion for trigeminal neuralgia. J Neurosurg. 1983;59:1007–1012.15.
10. Hakanson S. Trigeminal neuralgia treated by the injection of glycerolinto the trigeminal cistern. Neurosurgery. 1981;9:638–646.16.
11. Sweet WH, Wepsic JG. Controlled thermocoagulation of trigeminalganglion and root for differential destruction of pain fibers. Part I:trigeminal neuralgia. J Neurosurg. 1974;39:143–156
12. Shaw, P., Duncan, A., Vouyouka, A., Ozsvath, K. Radiation exposure and pregnancy. J Vasc Surg. 2011;53:28S–34S
13. Berman JM, Puscheck EE, Diamond MP. Full term vaginal live birth afterlaparoscopic radiofrequency ablation of a large, symptomaticintramuralfibroid: A case report. J Reprod Med 2012;57:159-63.11
14. Kanjwal Y, Kosinski D, Kani M, Thomas W, Grubb B. Successfulradiofrequency catheter ablation of left lateral accessory pathway usingtransseptal approach during pregnancy. J Interv Card Electrophysiol2005;13:239-42.
15. Umino M, Kohase H, Ideguchi S, Sakurai N. Long-term paincontrol in trigeminal neuralgia with local anesthetics using anindwelling catheter in the mandibular nerve. Clin J Pain 2002; 18:196–910
16. Singh B, Bhardwaj V. Continuous mandibular nerve block for painrelief. A report of two cases. Can J Anaesth 2002; 49: 951–311
17. Kohase H, Umino M, Shibaji T, Suzuki N. Application of a mandibular nerve block using an indwelling catheter for intractablecancer pain. Acta Anaesthesiol Scand 2004; 48: 382–3
18. Kumar, N., Shashni, S., Singh, R. and Jain, A. (2012), Mandibular nerve block for peri-operative pain relief using a peripheral nerve stimulator. Anaesthesia, 67: 77–78.
19. Peters, G., Nurmikko, T.J., 2002. Peripheral and gasserian ganglion-level procedures for the treatment of trigeminal neuralgia. The Clinical Journal of Pain 18 (1), 28–34
20. Kanpolat Y, Savas A, Bekar A, et al. Percutaneous controlledradiofrequency trigeminal rhizotomy for the treatment of idiopathic trigeminal neuralgia: 25-year experience with 1600 patients.Neurosurgery 2001;48:524–32.
21. Broggi G, Franzini A, Lasio G, et al. Long-term results of percutaneous retrogasserian thermorhizotomy for “essential” trigeminalneuralgia: considerations in 1000 consecutive cases. Neurosurgery1990;26:783–6

