

Evaluation of Interventional Role of Nerve Block Procedures in Reduction of Opioid Dose among Cancer Patient in Tertiary Care Cancer Hospital in Pakistan

Irum Ghafoor^{1*}, Adeel Siddiqui², Haroon Hafeez¹ and Hafiz Muhammad Usman²

¹Department of Internal Medicine, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan

²Department of Pharmacy, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan

Correspondence should be addressed to Irum Ghafoor, irumghafoor@skm.org.pk

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ABSTRACT

OBJECTIVE

To identify a decrease in opioid use for pain control in patients following an intervention via nerve block in cancer patients.

STUDY DESIGN

Retrospective cross sectional, descriptive study.

METHODOLOGY

The results included an analysis of pain scores pre and post procedures as well as decrease in the dose of opioids needed for pain. A total 36 patients underwent various nerve block procedures during period of the study. Out of those 26, 20 patients were on opioids for pain management. The results were determined in analysis of comparison of pain scores before and after the procedures and the changes in opioid doses. Study was done in Shaukat Khanum memorial cancer hospital and research center, Lahore, Pakistan, from January 2019 to March 2019.

RESULT

The mean dose of opioids prior to procedures was 221 mg \pm 115.25 mg and the mean dose of opioids after procedure was 182 \pm 145.95. 38.1% (n = 8) patients had metastatic disease. In 47.6% of the patients, site of pain was the face. 9 out of these ten patients underwent a trigeminal nerve block procedure. 66.7% patients (n = 14) were on tramadol and 26.8% (n = 6) patients on morphine.

CONCLUSION

As opioid use is associated with numerous side effects, issues with patients' compliance as well as risk of drug abuse. We feel this review adds strength to the belief that peripheral and central nerve block procedures are a cost effective and patient friendly modality to use for pain management in cancer patients.

KEYWORDS

Nerve block; Opioids; Cancer patients; Pain management

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INTRODUCTION

The existence of palliative care resides in the rational use of opioids and their immediate availability to suffering patients. Pakistan is among the top producers of opium and morphine. In contrast, the provision of pain relief services using opioid drugs is poor in Pakistan for patients in need of palliative care. According to the World palliative care alliance, in 2012, out of more than 350,000 patients, needing palliative care in Pakistan, only around 300 people received any. According to the Drug laws of the country; morphine comes in schedule B and is a controlled drug. The government, to tertiary care and military hospitals, allots a specific quota. This quota is scarce and fails to provide for the needs of patients with acute pain management in these hospitals. Morphine sulphate is a restricted drug and only prescribed by consultants with specific credentials in pain management. Control measures taken to prevent illegal use of the drug completely ignore the need of those suffering from severe pain at the end of life. The absence of access to opioids for patients in palliative care, results in the unfortunate deaths of patients dying of cancer or other painful illnesses [1].

According to a study conducted in 2012, cancer cases had equal incidence in both of the genders among Pakistani population, where highest incidence was of breast cancer (23%), head and neck cancers (8.6%), lung cancers (4.6%), non-hodgkin lymphoma (4%) and colorectal cancers (3.6%), respectively. Cancer is a growing and potentially burdensome health challenge in Pakistan. The burden expected to rise, in the coming period due to overpopulation and increase in proportion of geriatric population, along with cancer-causing behaviour like sedentary lifestyle, poor nutrition, smoking, etc. Cancer burden can be prevented in Pakistan by spreading knowledge about cancer control, including tobacco

control, early detection, vaccination (against liver and cervical cancer), and promoting physical activity and healthy eating. Proper therapy and palliative care can prevent additional suffering and premature death from cancer. Government and civil society has to take the lead in raising awareness against cancer to eliminate the malignant burden of cancer [2].

The process of nociception includes the transmission of pain stimulus from tissue damage site to the brain via lateral spinothalamic tract, where the stimulus was handled, interpreted and triggered in the form of the descending pain modulatory system [3].

The disruption of nociceptive pathways at both the central and peripheral levels can be another treatment method for patients suffering from severe cancer pain. So an interventional neuroablatory or non-destructive technique can be used for this purpose [4].

Mostly cancer related pain is relieved by using WHO analgesic ladder in cancer patients while it has been expected that about 2% - 5% patients with advanced and progressive cancers have poor control of pain by using analgesics according to WHO pain ladder [5].

Nerve block procedure, which is a method of producing anaesthesia may be used in these patients for prevention or controlling pain. There are two types of nerve blocks, nonsurgical and surgical. Nonsurgical nerve block targets specific nerve or a bundle of nerves, particular medication is injected which prevents the nerves' impulses from reaching the central nervous system (CNS). Surgical nerve block comprises purposefully disconnecting the nerve through surgical intervention, resulting in prevention of sending out impulses to the CNS. The types of nerve block for the specific part of the body include: Trigeminal nerve block for facial pain,

ophthalmic nerve block for eyelids and scalp, supraorbital nerve block for forehead pain, maxillary nerve block for upper jaw pain, sphenopalatine nerve block for nose and palate area pain, whereas epidural blocks are used for neck and back pain. Subarachnoid block and celiac plexus block is used for abdominal pain, cervical plexus block and cervical paravertebral block for shoulder and upper neck pain, brachial plexus block, elbow block, and wrist block for shoulder, arm, hand, elbow, and wrist area pain, respectively [6]. The success of adopting these techniques mainly depends upon the choice of the correct treatment for the accurate patient.

It is mandatory to assess patient carefully for better outcomes. The assessment criteria includes patient characteristics and preferences, treatment history, characteristics and mechanism of pain, and logistics and skills to execute these invasive techniques. Furthermore, there may be some complications associated with these interventional techniques. Hence, risks versus benefits should be kept in mind while selecting the invasive technique for every patient [7,8].

This article aims to review and identify decrease in opioid use for pain control with the help of intervention via nerve block in cancer patients at SKMCH & RC.

MATERIAL AND METHODS

Pain Assessment

Upon admission and clinic appointment, the patient is assessed for pain localization, aetiology and pathophysiological type of pain according to hospital pain management guidelines. For non-critical patients, PQRST assessment and numerical rating scale are used to assess pain in adults and geriatrics, while in paediatrics; Wong-Baker FACES pain rating scale is used. On the other hand, for critical patients, FLACC scale is used in children; while CPOT and BPS scales remain the most robust scales for assessing pain in adults unable to self-

report. The scale numbers from 0 - 10, i.e. 0 - 3 numbers depict mild pain; 4 - 7 numbers indicate moderate pain and 8 - 10 numbers show severe pain.

Pain Treatment

According to the hospital pain management guidelines, all types of pain are treated keeping in view the WHO analgesic ladder. In WHO Step I, non-opioid analgesics are prescribed with or without any adjuvant. In WHO Step II, weak opioids with or without non-opioids and/or adjuvant are added to treat mild to moderate pain. In WHO Step III, strong opioids with or without non-opioids and/or adjuvant are added to treat severe pain. We apply the fourth step, when all the other options are exhausted, and opt for nerve blockage.

To treat neuropathic pain, corticosteroids, antidepressants and anticonvulsants can be added at each step among the adjuvants. These are the first choice of drugs in case of neuropathic pain e.g. phantom limb syndrome or major pain syndrome etc. The need to add adjuvant therapy arises from lack of response to analgesics alone. For neuropathic pain which is dysesthetic and burning in nature, antidepressants were added. For paroxysmal neuropathic pain which is stabbing in nature, anticonvulsants were added. In case of pain arising due to cord compression, corticosteroids were added. Although when need was assessed, nerve blockage was used where appropriate [9].

Study Design

This study was conducted in Shaukat Khanum memorial cancer hospital and research centre (SKMCH & RC), Lahore, Pakistan in first quarter of year 2019. Data collection was done in May, 2019. Medical records of all cancer patients who underwent nerve block, were reviewed via online data base of hospital i.e. hospital information system (HIS). And the role of interventional

nerve block procedures in the reduction of opioid dose among cancer patient was evaluated.

As this was a retrospective cross sectional review carried out at SKMCH & RC, so an exemption was given regarding approval of this study from IRB of SKMCH & RC.

Inclusion criteria

Cancer patients who were on opioids and underwent nerve block procedures, and were enrolled as a regular patients in SKMCH&RC.

Exclusion criteria

Opioid naive patients prior to the procedure.

Statistical Analysis

Data were investigated by using Microsoft excel and SPSS version 20. The results were represented in tabular and graphical form. Descriptive statistics were performed on all categorical variables to check the differences in frequency of distribution by using simple frequency statistical tab. Mean pain scale and equivalent opioid dose were calculated for all the patients. The efficacy of nerve block treatment was assessed as diminution in pain scale score after the nerve block procedure as compared to the score before the procedure. Reduction in need of opioids equivalent dose after the nerve block procedure in contrast to their need before the procedure has also been used to assess the effectiveness of the treatment. Measures of the centre, such as standard deviation and mean were calculated to compare the analgesic outcome of the study.

RESULTS

A total of 36 patients underwent various nerve block procedures from January 2019 to March 2019. 20 patients were on opioid prescription for pain management. The mean dose of opioids prior to nerve block procedure was 221 mg ± 115.25 mg while the mean dose of opioids after

the procedure was 182 mg ± 145.95 mg. The mean value of pain assessment prior to nerve block procedure marked on pain scale was 6.29 ± 1.95 and the mean value of pain assessment after the procedure marked on pain scale was 0 as shown in Table 1.

Parameters	N	Minimum	Maximum	Mean	Std. Deviation
Age	20	30	69	49.81	12.372
Prior Dose	20	40	300	221	115.253
Post Nerve Block	20	40	400	182.5	145.959
Pain Scale: Pain Assessment Prior to Procedure	20	4	10	6.29	1.953
Pain Scale: Pain Assessment after Procedure	20	0	0	0	0
Valid N List Wise	20				

Table 1: Descriptive statistics of the patients who went under nerve block.

Majority of the patients had head and neck cancers (71.4%), while percentage of patients with squamous cell carcinoma & adenoid cystic carcinoma was 9.5% each, and patients with nasopharyngeal carcinoma and breast cancer was 4.8% each as shown in Figure 1.

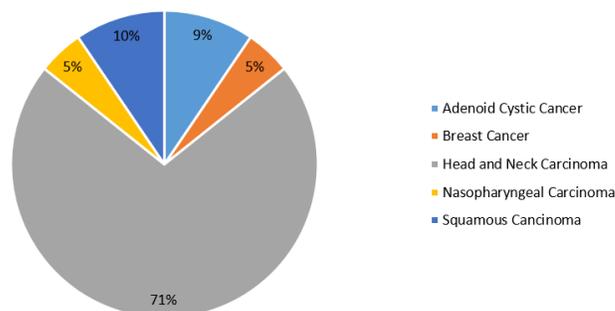


Figure 1: Type of malignancies in patients who went under nerve block.

61.9% of the patients had non-metastatic disease while 38.1% patients who went under nerve block procedure had metastatic disease, as shown in Figure 2.

53.4% of patients had facial pain, 14.3% patients had tongue and mandibular alveolar mucosa pain, 9.5% patients had cervical muscle pain, 9.5% had tongue and throat pain, 4.8% patients had pain in right jaw and neck, 4.8% patients had tongue pain and 4.8% patients had generalized body pain, as shown in Figure 3.

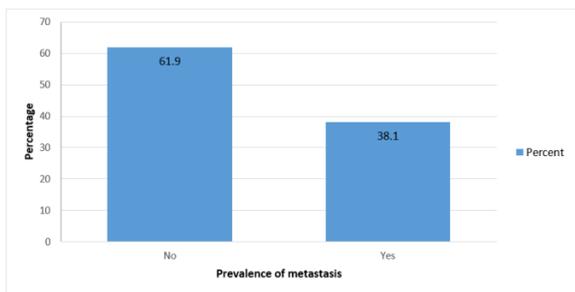


Figure 2: Percentage of patients with and without metastasis, who went under nerve block.

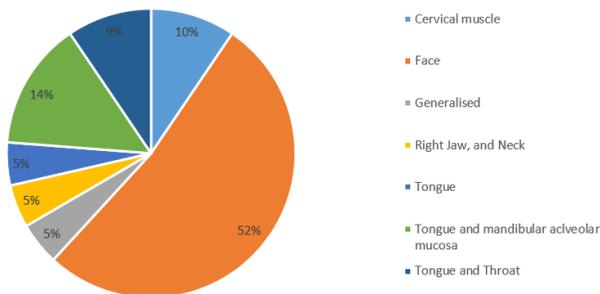


Figure 3: Prevalence of site of pain among patients who went under nerve block.

42.9% of the patients enrolled in the study underwent trigeminal nerve block, 9.5% patients underwent great occipital nerve block, 4.8% patients were injected botulinum toxin, 9.5% patients had masticatory and cervical muscle trigger point injections, 4.8% patients underwent sphenopalatine ganglion neurolysis, 23.8% of the patients underwent trigeminal nerve neurolysis and 4.8% patients underwent sphenopalatine nerve block, as shown in Figure 4.

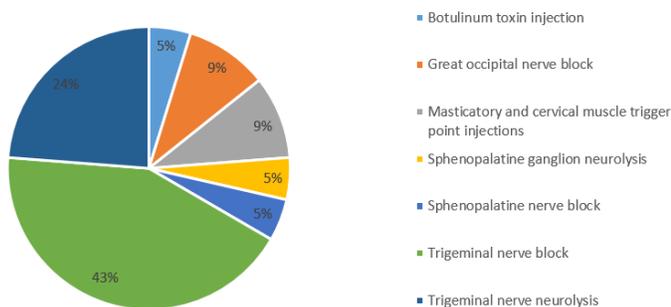


Figure 4: Types of nerve blocks done for patient enrolled in the study.

66.7% patients were on Tramadol (weak opioid) prior to nerve block which came down to 42.9% after nerve block procedure, 28.6% patients were on morphine (strong

opioid) prior to nerve block which increased to 42.9% after nerve block procedure and 9.5% patients used PCM + Orphenadrine after undergoing nerve block, as shown in the Figure 5.

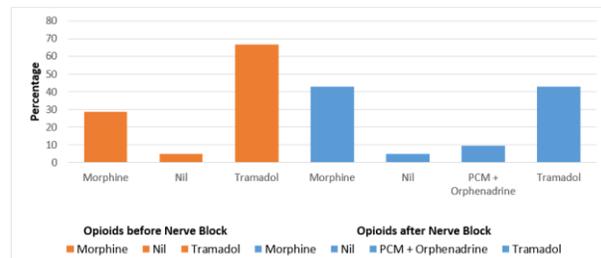


Figure 5: Opioid analgesia prior to and after nerve block. The percentage usage prior to nerve block is shown in orange legend and after nerve block is shown in blue legend.

DISCUSSION

Nerve blockage is an effective means of relieving pain in cancer patients. The odds can be turned in patients’ favour when it is indicated for patients as an individual regimen for pain management. Though, the results of our study may be biased as the selected population were patients having metastasized or non-metastasized cancer.

In this retrospective study, it has been assessed that the procedure of nerve block allowed the reduction in the opioid dosage from 221 mg ± 115.25 mg to 182 mg ± 145.95 mg. Where, statistically, the mean value of opioid doses shows a reduction in value after the nerve block procedure.

A potential constraint of this study is because of its nature of analysis which has been performed on a collection of retrospective data. This may be associated with reviewer bias, predispositions and amplification of the positive reactions. This has been resolved through collection from hospital information system designed to record patient’s electronic data, henceforth, diminishes the probability of such inclination. Moreover, study recorded the opioid history of patients before opting for nerve block, and after the procedure as well. This is the principal study that has assessed the viability of reducing opioid dosing with this

novel technique of pain management. It has proven to be unique as it has not been done in Pakistan with given prospective.

The limitation of nerve block in patients with pain is that it can be only as good as blockage of impulse of pain for the given nerve. The pain can re-emerge from regrowth of nerves or from the progression of disease. Other side effects, depending upon the type of nerve block include diarrhoea, limb paralysis and sphincter weakness [10]. It is considered as a possible fourth step in WHO ladder, when all other options are inadequate. Though, it is considered preferable for advanced stage disease, only 38.1% patients with metastasized cancer went under nerve block for pain management in our study.

Ayers et al., in a study of 28 patients deduced that regional nerve block reduced the use of opioids in patients undergoing complete sternal-sparing surgery. 54% of the

total patients in the study received nerve block and the post-operative pain management was optimized with reduction in use of opioid dose [11].

CONCLUSION

Management of cancer pain is challenging due to the complex nature of pain and furthermore, it cannot be treated with conventional pain relieving medicine only. Using nerve block procedures can improve the odds. A risk to benefit ratio must be assessed before opting for invasive strategies. Henceforth, more research can be done in the area of pain management with interventional approach.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1. Khan RI (2017) Palliative care in Pakistan. *Indian Journal of Medical Ethics* 2(1): 37-43.
2. Sarwar MR, Saqib A (2017) Cancer prevalence, incidence and mortality rates in Pakistan in 2012. *Cogent Medicine* 4(1): 1288773.
3. Garland EL (2012) Pain processing in the human nervous system: A selective review of nociceptive and biobehavioral pathways. *Primary Care: Clinics in Office Practice* 39(3): 561-571.
4. Calmels V, Vallée JN, Rose M, et al. (2007) Osteoblastic and mixed spinal metastases: Evaluation of the analgesic efficacy of percutaneous vertebroplasty. *American Journal of Neuroradiology* 28(3): 570-574.
5. Sloan PA (2007) Neuraxial pain relief for intractable cancer pain. *Current Pain and Headache Reports* 11(4): 283-289.
6. Chang A, White BA (2019) *Peripheral nerve blocks*. StatPearls Publishing.
7. Scott-Warren J and Bhaskar A (2015) Cancer pain management: Part II: Interventional techniques. *Continuing education in anaesthesia, Critical Care & Pain* 15(2): 68-72.
8. Kurita GP, Sjøgren P, Klepstad P, et al. (2019) Interventional techniques for the management of cancer-related pain: Clinical and critical aspects. *Cancers* 11(4): 443.
9. Grond S, Radbruch L, Meuser T, et al. (1999) Assessment and treatment of neuropathic cancer pain following WHO guidelines. *Pain* 79(1): 15-20.
10. Miguel R (2000) Interventional treatment of cancer pain: The fourth step in the World Health Organization analgesic ladder?. *Cancer Control* 7(2): 149-156.
11. Ayers B, Stahl R, Wood K, et al. (2019) Regional nerve block decreases opioid use after complete sternal-sparing left ventricular assist device implantation. *Journal of Cardiac Surgery* 34(5): 250-255.