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Percutaneous Electrical Nerve Stimulation (PENS) Therapy for the Management of Focal Neuropathic Pain – a case series of 42 cancer patients

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Introduction

Cancer patients suffer from neuropathic pain due to a variety of reasons; the disease in itself due to tumour infiltration of peripheral nerves and nerve plexuses, but also due to cancer treatment, be it radiotherapy, chemotherapy or surgery. Management of neuropathic pain in these patients has always posed a challenge to the clinician due to the complex nature of the disease; both topical and systemic neuropathic agents along with analgesics including opioids are capable of controlling the pain in most cases, this may be limited by either inadequate analgesia or undesirable side-effects. Neuromodulation is well known to be effective in the management of neuropathic pain and spinal or peripheral nerve stimulation are found to be beneficial in refractory cases. Implantable neurostimulators and electrodes are often unsuitable in cancer patients as they require frequent MRI scans for the follow-up of their disease and treatment and is even relevant in patients with advanced disease as they are often involved in drug trials. PENS therapy using a percutaneous disposable electrode offers an effective peripheral neuromodulation technique for providing good analgesia for neuropathic pain in these group of patients. We are presenting our case series of 103 treatment episodes in 42 patients in one of the largest cancer hospitals in Europe.

Aims & Objectives

Peripheral nerve stimulation or field stimulation is to be carried out using PENS therapy in the affected area of neuropathic pain as per standard protocol and the objective was to monitor improvement in pain scores and the reduction in allodynia and hyperpathia. We also looked for reduction in the usage of opioids and systemic neuropathic agents post-procedure and also the patient global impression of change.

Methods

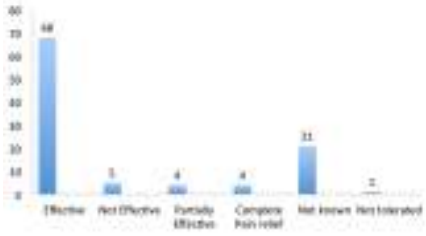
We looked at our case series of 42 cancer patients with focal neuropathic pain and most of them had symptoms of allodynia and hyperpathia. We had 103 treatment episodes using standard protocol i.e. 20G disposable probe either 50 mm or 100 mm in length inserted percutaneously after LA at the site of insertion. Stimulation was given at alternating frequencies of 2 Hz and 100 Hz every 3 seconds for 25 minutes.

Percutaneous probe placement to give peripheral stimulation

Results

The areas treated are given above with the majority patients having their pathology in the head & neck or the trigeminal region and the torso; commonest cause was post-irradiation neuropathy in the former and surgical scar pain in the latter.

40 out of 42 patients reported significant pain relief. One patient did not have any pain relief and refused a second treatment; another patient did not tolerate the procedure and had to abandoned after about a minute of stimulation. Different treatment episodes in the same patient sometimes gave varying results even with the same operator, technique and protocol and this could be due to various factors including probe placement, systemic analgesia and also patient expectations and stage of the cancer. The results are as given below.



The average duration of pain relief in the series was 61 days; some patients are still on follow-up and hasn't required treatment for over 250 days It was noted that patients in the head & neck group and groin scars had the longest duration of analgesia and the patient groups treated for abdominal and chest-wall pathology had shorter pain relief period.

Discussion

Patients also reported satisfaction with their pain relief , better sleep pattern and overall improvement in quality of life. Objectively, it was noted that the patients had good relief of their allodynia and hyperpathia and also that there was a significant reduction in the use of systemic neuropathic agents and opioid analgesics. All but one patient tolerated the procedures very well; the side-effects(flare-up of pain) and reported complications (local pain and bruising in 4 cases) were self-limiting.

Conclusion

PENS is a cost-effective, minimally invasive, well-tolerated non-drug option for the management of focal neuropathic pain. It also gives an option for neuromodulation in patients who cannot have implanted devices like our group of cancer patients.

Our preliminary results from the case series are promising, but well designed RCTs are needed for further evaluation of this novel peripheral neuromodulation technique.

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