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Epidural Alcohol Neurolysis–A Good Option for Cancer Pain Management in Developing Countries

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Background

20 million new cancer cases are reported every year. Up to 73% of patients are in pain at the time of diagnosis. The goal of cancer treatment is generally pain reduction and functional recovery to optimize the quality of life (QOL). Inadequate pain relief from systemic medications is common in patients with an advanced malignancy.[1] As many as 43% of patients with malignancies do not experience adequate pain relief from systemic medications, in those patients, the systemic opioid dose must be increased in order to control the pain.[2] However, increase in the systemic opioid dose causes serious adverse effects. Nerve block or neurolysis as interventional approach can be an effective treatment option for patients experiencing dose limiting adverse effects of opioids.[3] The role of neurolytic blocks in the management of any type of cancer pain has not been firmly established by randomized, blinded clinical trials. Neurolytic Blocks had been extensively used in the early part of the 20th century for cancer pain management. With the advent of newer analgesics and the development of safer techniques for pain management, its use has markedly diminished. But all these newer techniques need higher expertise, cost and special instruments like Radiofrequency machine, C-ARM and Ultrasonography. Whereas Neurolytic techniques are more feasible, cheaper and equally safe and effective. This study was undertaken to establish safety and efficacy of Epidural Alcohol Neurolysis for severe cancer pain where other modalities failed to give adequate pain relief. In this study we have used repeated low concentration of ethyl alcohol to prevent motor complication. To permit repeat injection transcatheter epidural technique was used.

Material and methods

A total of 10 patients with proven cancer pain in CA lung and breast were selected. 7 males and 3 females were intervened with the average age of 57.4 ± 15.9 years (range: 30-78 years). Median age was 62years, Mean was 61.7. There were 7 patients of lung cancer and 3 patients of breast cancer. Following approval of Institutional reviewer board, patients' informed consent was taken.

Patients having Lung and Breast malignancy with severe pain mostly on opioid treatment were selected. Pain intensity was assessed for each patient using a numerical rating scale (VAS) from 0 to 10 (0 is no pain and 10 is worst pain imaginable).[3] Basic demographic data (including any prior radiation therapy and/or chemotherapy) were recorded. Follow up done for 3 months.

The site for placement of the epidural catheter was selected based on the underlying pathology as well as on each patients description of the pain dermatome. All patients were having pain between T1-T12 dermatome level. Epidural was performed either sitting or lateral position depending on patient comfort. Under aseptic precautions skin of epidural site was anaesthetized with 1% Xylocaine. A 20 G catheter was placed 3-5 cm within the epidural space at level of T5-T6 level using an 18 G Touhy needle using loss of resistance technique. Correct placement of catheter was tested by complete pain relief with 5 ml of 0.125% Bupivacaine injection and aspiration for CSF and blood. The epidural catheter was taped securely in place. Epidural injection of 5 ml of 50% Alcohol was done slowly 4 hours after LA injection test. The patient was positioned 30° Head up with supine for visceral or bilateral somatic pain or Lateral on affected side up for unilateral pain as alcohol is bit hypobaric in nature. 12 After injection catheter was flushed with1 ml of 0.125 % bupivacaine. Second and third epidural alcohol injections were made in a daily basis until the patient experienced 75% pain relief persistent over 24 hours and decrease in narcotic use of at least 25%. Patients were asked about any tingling, numbness, sensory loss, motor weakness, bladder and bowel dysfunction. The position of patient, precautions and techniques were kept similar on all 3 days. The intravenous hydration was only instituted in cases where patients experienced nausea vomiting, diarrhoea or hypotension. Heart Rate, Blood Pressure and Spo2 monitoring were utilized during each injection. Catheter was removed at least one hour following final injection of alcohol. Following the procedure, patients could receive medications according to a modified analgesic regimen based on World Health Organization guidelines.[4] The patients were discharged 24 hrs after catheter removal.

The opioid requirements were converted to daily oral morphine equivalents. The time required to perform the block, any complications during or after the procedure (including transient paresthesia, hematoma, infection, dural puncture, bowel/bladder dysfunction, pain on injection, hypotension or any other complication). Pain Intensity (VAS) and Oral Opioids Consumption were taken pre and post procedure, 1 week, 2 weeks, 4 weeks, 8 weeks and 12 weeks.

Statistical analysis

Grand Chart was prepared using MS-excel while statistical analysis using t-tests was performed using SPSS v20.0 (IBM Corporation, USA). Values are presented as mean ± SD, range, percentage and number. At 95% confidence interval differences were considered to be statistically significant at $p<0.05$.

Results

10 patients were selected in the study. All patients reported 70% or greater pain relief with 25% decrease in narcotic dose. The overall mean duration of pain relief was 3 months. 4 of the 10 patients died during the follow-up period and were pain free. Pain Scores were reduced from 9.1 ± 0.73 (range: 8-10) preprocedurally to 2.5 ± 0.7 (range: 1-3) after 1 week, 3.4 ± 2.2 (range: 1-8) after 2 weeks, 2.87 ± 0.99 (range: 1-4) after 4 weeks, 3.16 ± 1.32 (range: 1-5) at 8 weeks and 3.5 ± 1.37 (range: 1-5) after 12 weeks (Table 1).

Table 1 Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation	
N					
Pre Injection VAS	10	8	10	9.1	0.73786
VAS at Discharge	10	2	3	2.5	0.52705
VAS Week 1	10	1	3	2.5	0.70711
VAS Week 2	10	1	8	3.4	2.27058
VAS Week 4	8	1	4	2.875	0.99103
VAS Week 8	6	1	5	3.1667	1.32916
VAS Week 12	6	1	5	3.5	1.3784

In addition, the mean consumption of morphine was reduced from 75 ± 13.54 mg pre procedure to 35 ± 5.27 mg at the discharge and end of 1 week, 31 ± 3.16 mg at 2 weeks, 35 ± 5.34 at 4 weeks, 32.86 ± 4.87 at 8 weeks and 33.33 ± 5.16 at 12 weeks. No complications or serious side effects were encountered during or after the procedure.

Discussion and conclusion

Cancer pain is multifactorial. It may be somatic, visceral or neuropathic. And 50% of patients have combination of pain at time of diagnosis. The failure to obtain adequate pain control prompted the use of interventional pain procedures. Neurolytic Blocks are very important part in armamentarium of pain treatment. Neurolytic techniques have very low risk benefit ratio. So expertise and sound clinical judgment are very important. The effects of neurolytic therapy typically persist between 3–6 months. There are risks of neuritis, neurologic deficit, damage to non-neural tissue (such as skin or organs) or non targeted neural structures, and impermanent effects. There may be incomplete pain relief due to existing adhesions, tumor or nerve destruction.

Sporadic cases of pain relief following injection of ethyl Alcohol into epidural spaces have appeared in literature since 1930. In 1931 Dogliotti described the use of subarachnoid alcohol for the treatment of sciatic pain.[5] Early reports described the injection of local anaesthetic with alcohol into the caudal epidural space for relief of intractable pelvic and perineal pain due to rectal and prostatic cancer.[6–8] In 1940 Odom reported the injection of 10-15 ml of 95% alcohol into epidural space for severe pain due to generalized carcinomatosis.[9] The instillation of ethyl alcohol into the thoracic epidural space for neurolysis was first described in literature by Groenendijkn.[10] He used rapid peridural injection of 33% of alcohol through a needle to treat 17 patients with cancer pain. Each injection provided 1-3 weeks of pain relief and the technique was repeated as necessary to achieve long term relief of pain. He also found no motor complications following epidural neurolysis; there was transient back pain following alcohol injection, and pain relief was not always complete. Two patients required intravenous hydration for transient light headedness following injection. In1967 Bromage described the successful treatment of intractable pain caused by Pancoast's syndrome using a single injection of 5ml absolute alcohol into the epidural space at T2. He did not report any complications. However he concluded that epidural neurolysis should be reserved for intractable pain due to malignancy.[11] Since that time, neuraxial chemical neurolysis via the intrathecal or epidural approach is only considered in advanced, irreversible, and progressive illness (such as cancer) due to the severity of potential complications. Careful patient selection and technique are therefore critical.

Ethyl alcohol is a nonspecific, irritating, hypobaric neurolytic agent which spread very fast.[12] It is generally available as a 95 percent solution. Its mechanism of nerve destruction is similar to phenol. Alcohol extracts phospholipids, cholesterol and cerebroside from neural tissues and precipitates mucoprotein and lipoprotein. Although 50 to 100 percent alcohol is used as a neurolytic agent, the minimum concentration required for neurolysis has not been established. It produces severe burning dermatome pain within 5-10 minutes of injection other than subarachnoid injection. It requires 12 to 24 hours for the assessment of the effect of the injection.

A transcatheter approach to phenol neurolysis has been described with reported success rate of 50 – 86% and a total duration ranging from 2 weeks to 3 months.[13] Bromage compared ten cases of thoracic epidural neurolysis using ethyl alcohol with seven cases using 6% aqueous phenol.[14] He performed single injections with each agent and gave the alcohol as a bolus. Although he noted better pain relief using alcohol. Accidental injection of alcohol into the subarachnoid space will result in an immediate burning dermatomal pain, which should provide adequate warning to stop the injection and assess the patient. Subarachnoid injection of phenol is painless. Phenol has a greater affinity for vascular structures[15] a property that has resulted in severe neurologic sequelae.[16] Both alcohol and phenol can result in a 10% incidence of painful paresthesia or neuritis after injection onto peripheral nerves.

In the study all patients reported significant immediate as well as long term pain relief. Epidural Catheter placement can be done using landmark and loss of resistance technique. It doesn't require C-arm, Ultrasound or Nerve Stimulation and can be effectively done at bed side. Transcatheter Alcohol epidural neurolysis can contribute greatly to an increased quality of life in cancer patients. There were no serious adverse effects associated with the treatment. The safety of the technique in this study is attributable to: 1) transcatheter installation of alcohol. 2) daily verification of pain relief and catheter position using local anesthetic prior to beginning any alcohol injection; and 3) daily dosing with total volumes of ethyl alcohol never exceeding 5 ml.

Conclusion

The epidural alcohol neurolysis is a good alternative technique for the treatment of intractable cancer pain in developing country like India. The benefits include improved analgesia, reduced opioid consumption, favorable economic implications and superior clinical effects. Pain practitioners should consider the role of these blocks in adjuvant therapy for the optimal treatment of cancer pain. However, large, well-controlled studies and refinement of the technique using other radiological methods are needed to improve the safety and efficacy of Epidural neurolytic technique using Alcohol.

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None.

Conflicts of interest

There is no conflict of interest.

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