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Epidural analgesia during brachytherapy for cervical cancer patients

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ABSTRACT

Aims: To find out the efficacy of epidural analgesia in providing continuous pain relief for patients undergoing brachytherapy for cervical cancer.

Settings: Teaching Hospital.

Design: Retrospective Study.

Materials and Methods: A total of 152 patients of cervical cancer received epidural analgesia during 18 to 21 hours of pelvic brachytherapy. Epidural top up was given using 60-100 µg of buprenorphine every 08-10 hrs. Additional top up or systemic analgesics were given for breakthrough pain.

Results: Majority of patients 119 out of 152 received epidural top up twice during their stay in the brachytherapy ward. Only 20 out of 152 needed additional analgesics.

Conclusions: Epidural analgesia is safe and provides satisfactory pain relief during brachytherapy and makes patient's stay more comfortable.

KEY WORDS: Analgesia, brachytherapy, epidural

Carcinoma cervix is the leading site of cancer among females in India. According to the National cancer statistics (NCRP, ICMR), cervical cancer constitutes 15.2-26.9% of all cancers.[1] Among the six registries, lowest is seen in Mumbai (15.2%), highest in Chennai (26.9%) and an exceptionally high incidence of 50.7% is reported from the only rural Barshi registry. It constitutes 19.3% (309/1604 over six years) of all cancers in our hospital. Brachytherapy forms an important part of the curative treatment of carcinoma cervix and we use manual after loading low dose rate (LDR) brachytherapy in the form of Intracavitary application or transperineal interstitial template application. As per the AERB, more than half (130 out of 231) brachytherapy centres in India still practice LDR brachytherapy. The treatment duration ranges between 18 and 21 hours. Even when transperineal implantation is done using fractionated HDR brachytherapy, patient has to retain the applicators for almost the same time as in LDR. Hence continuous analgesia is equally important to reduce pain and patient discomfort during intracavitary application with LDR as well as transperineal implantation with both LDR and HDR.

The reasons for pain and discomfort are multi factorial. It is cumbersome for the patient to retain the applicators along with the vaginal packing for long duration. Bladder catheterization and skin sutures add to the pain. This discomfort is compounded by isolation of the patient, being confined to bed without any movement. The pain is more severe in case of transperineal template application as the needles penetrate through the skin right into the parametrium. The pain is considerably worsened by patient movement from operating table to the trolley, to the simulator and from there to the bed. In the ward close supervision is severely limited by the need to reduce radiation exposure to staff. All these factors make brachytherapy an unpleasant experience for the patients.[2]

The presence of applicators in the uterus and vagina stimulates the sympathetic autonomic afferents, as they enter the spinal cord at the T10-L1 level. This produces poorly localized, central, lower abdominal pain of a cramping nature associated with nausea and vomiting.[2] Distension of the cervix and upper vagina stimulates parasympathetic autonomic afferents from the pelvic splanchnic nerves of S2-4 to cause lower back pain. Vaginal packing and the retaining suture through the labia stimulates somatic afferents *via* the pudendal nerves of S2-4.[2]

Various methods for controlling the pain include oral or systemic use of analgesics and regional anaesthesia. In this trial we have studied the

efficacy of analgesics given through the epidural catheter. Epidural analgesia blocks the spinal nerves in the epidural space as they pass from duramater to the intervertebral foramina.Along with sensory analgesia it also produces sympathetic and motor block. Lumbar epidural block seems to be ideally suited for the treatment of pain associated with pelvic low dose rate brachytherapy.[3]

MATERIALS AND METHODS

A total of 158 patients underwent brachytherapy procedure for carcinoma of cervix in the department of Radiation Oncology between August1999 and December 2005. Six patients received spinal anaesthesia alone and hence are not considered for analysis. All these 152 patients received radical radiotherapy. Hundred and seven patients underwent intracavitary application whereas 45 underwent transperineal interstitial implantation. A total of 11 patients received radiation following hysterectomy.

All patients were subjected to preanaesthetic checkups which included CBC, RFT, Electrolytes, BT, CT, chest X-ray, ECG, echocardiogram (whenever necessary) and anaesthetist's consultation. All procedures were done in the operation theatre and 94 patients have also received spinal anaesthesia for immediate effect for the procedure.

Tuohy needle used for the procedure is typically 16-18 G, 8 cm long with surface markings at 1cm intervals, and has a blunt bevel with a 15-30 degree curve at the tip. The epidural space is identified as the bevel of the needle exits the ligamentum flavum. The epidural space is identified by loss of resistance when pressure is applied to the plunger of the syringe. Once the position of the needle is confirmed, the catheter is gently threaded via the needle into the epidural space and the syringe is removed, leaving approximately 5 cm of the catheter inside the epidural space. A combined spinal epidural technique was used since August 2002, spinal for the procedure and epidural top up for post procedure analgesia.

All patients received first epidural top up of buprenorphine 60 to 100 µg before getting shifted from the theatre and then onwards once in 08-10 hrs or whenever patient complained of severe pain. Patients of interstitial implantation also received an additional top up half an hour before removal of the template. Patients also received additional analgesics diclofenac or tramadol injections for breakthrough pain.

95% confidence interval for the proportion was estimated by the binomial probability model.

RESULTS

Eighteen patients were in the third decade, 48 in fourth, 51 in fifth and 35 patients were above 60 years of age. Eighteen patients were hypertensive, nine patients had cardiac disease and 35 were above the age of sixty years. Out of 152 patients, 107 (70.39%, 95%CI 62.71-77.08%) patients received Intracavitary application and 45 (29.61%, 95%CI 22.92-37.29%) received transperineal implantation. Eleven patients were treated for postoperative recurrence in the vault and the parametrium. A total of 58 (38.16%, 95%CI 30.82-46.08%) patients received only epidural anaesthesia. Since 2002 August spinal anaesthesia was given for the procedure and epidural catheter was used only for postoperative pain control. Failure of epidural procedure was seen in 2/158 (1.27%, 95%CI 0.04-4.5%) patients and hence they received only spinal anaesthesia. The mean, median, and the range of duration of the epidural catheterization were 25 hrs 02 mins, 25 hrs 11 mins and 21 hrs 04 mins-27 hrs 26 mins respectively for intracavitary application. The mean, median, and the range of duration of the epidural catheterization were 18 hrs 54 mins, 19 hrs 47 mins and 08 hrs 37 mins-29 hs respectively for transperineal interstitial application. We observed that 30/152 (19.74%, 95% CI 14. 19-26.78%) patients needed epidural top up once, 119/152 (78.28 % 95% CI 71.45-84.55) patients needed twice. Only three patients required third epidural top up and they belonged to the interstitial implantation group. Twenty patients required additional analgesics in the form of injectable diclofenac sodium, tramadol.

We had to reposition the applicators and needles after simulation in nine patients. Three patients the intracavitary applicators had to be repositioned as the ovoid rotation was not acceptable. We had to adjust the transperineal needles in six patients.

The expected side effects of epidural anaesthesia/analgesia such as respiratory depression, hypotension were not seen in any of our patients. Sixty-six patients had nausea and vomiting and these patients also had received cisplatin chemotherapy during brachytherapy. Patients with hypertension, cardiac disease and elderly age group also tolerated equally well with out any side effects. Among 20 patients who received additional analgesics, 15 belonged to interstitial group and five, intracavitary.

DISCUSSION

The management of pain for patients undergoing pelvic brachytherapy is highly individualized and there are no standard guidelines available in the literature. Essentially it depends on the treating radiation oncologist and the individual department protocols.

The various options available are oral non-steroidal anti-inflammatory drugs (NSAIDs), systemic opioids, local anaesthesia in the form of paracervical block and epidural block. Oral and systemic analgesics are most commonly practiced but offer pain relief for insufficient duration. Moderate pain and breakthrough pain still remains and the effects would not be

for the long duration of LDR brachytherapy. Administration of oral analgesics to a patient who has undergone anaesthesia and procedure adds to the gastric complications. Patient controlled analgesia (PCA) in the form of systemic opioids is associated with problematic postoperative nausea and vomiting and hence is not suitable for early discharge. Sedatives like benzodiazepines are often used to alleviate distress and promote sleep during protracted treatment in younger, more anxious patients. Repeated injections are not only cumbersome to patients but also increase the number of visits by the nursing staff, thereby higher radiation exposure to them. Regional anaesthesia is also practiced in the form of Para cervical block, spinal and caudal block.[4,5] These do take care of the procedure but are not suitable for long hours of low dose rate brachytherapy.

Epidural analgesia is generally considered more effective among the available methods. The major advantages of epidural analgesia are that repeated injections are possible; it is safe and produces necessary pain relief for a longer duration. We have found it more useful for patients of transperineal implantation, as it is more painful. In these patients, epidural analgesia is not only helpful during the stay in the ward but also during removal of the applicators. Our important observation was that in nine patients, the position of the applicators and needles were repositioned and this was possible because of epidural analgesia. Lanciano *et al*, have used epidural analgesia for pelvic brachytherapy patients and have reported that a very good pain relief was seen with minimum requirement of systemic analgesics.[6] Continuous epidural or patient controlled epidural analgesia have been used extensively for labour and postoperative pain management in abdominal surgery. It gives a good analgesia but seems to be difficult in isolated brachytherapy wards as monitoring blood pressure, pulse, respiratory rate and oxygen saturation is mandatory.

Dolin *et al*, have reviewed the published data in over 20000 patients comparing the effectiveness of intramuscular, patient controlled analgesia (PCA) and epidural analgesia for acute postoperative pain. The percentage of patients who experienced moderate-severe or severe pain at some point of time during the first 24 hrs was assessed. The incidence of moderate-severe pain was 67.2%, 35.8% and 20.9% with intramuscular, PCA and epidural analgesia respectively. The figures were 29.1%, 10.4% and 7.8% respectively for severe pain. The difference was statistically significant and epidural analgesia was superior to other two modalities of analgesia. The authors admit that they could not come to any guidelines regarding the pain aggravated by movement or the need for rescue analgesia. Other important observation was that patient satisfaction with different analgesia was specifically not looked into as it is very complex and depends on many factors other than pain and pain relief.[7]

The failure rate of epidural analgesia described in literature is as high as 18.7%.[7] This is reported in the first 72 hrs of postoperative period and premature epidural catheter placement alone constitutes as high as 5.7% The other reasons for the failure described are unsuccessful placement, and unilateral block and missed segments. In our series we had two patients (1.27%) in whom epidural catheter could not be placed as epidural space could not be obtained. The expected complications of epidural analgesia include nausea, vomiting, retching and rarely respiratory depression, hypotension and blockage of catheter.[2] During procedure accidental subarachnoid puncture, intravascular injection of the drug can be seen. We have not come across any of these complications.

A reasonable number of our patients had nausea and vomiting; these patients also had received cisplatin chemotherapy during brachytherapy and hence can not be attributed to epidural top up alone.

Among various drugs available for epidural analgesia, buprenorphine is preferred because it is long acting up to eight hours and is less likely to cause respiratory depression.[8] Most of our patients received top up of analgesics twice at an interval of 8-10 hours. We had 62 pts of high risk patients who were hypertensive, cardiac or beyond 60 years of age. All of them tolerated the treatment well without any complications.

Block *et al*, in a Meta analysis have reviewed around 100 published articles and have compared epidural versus parenteral opiods in the management of postoperative pain. They have observed that, epidural analgesia, regardless of analgesic agent, location of catheter placement, and type and time of pain assessment, provided better postoperative analgesia compared with parenteral opioids.[9]

CONCLUSION

Epidural analgesia for patients undergoing LDR pelvic brachytherapy is feasible and produces satisfactory continuous pain relief. It is safe even in high risk patients such as elderly, hypertensive and cardiac patients. It is very useful in adjusting the position of the needles and during removal of the template. Apart from making patients stay more comfortable and less traumatic it also reduces the number of injections thereby reducing visits by the nursing staff and the associated radiation exposure. It would definitely be useful for a patient undergoing high dose rate brachytherapy also as the needles have to be retained for the treatment given in fractions over two days.

ACKNOWLEDGMENT

The authors would like acknowledge Dr.Rathna, Professor, HOD and the members of the Department of anaesthesia for their help in carrying out this work. We also acknowledge Mr. Suresh, statistician for his guidance in the interpretation of data.

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Source of Support: Nil, **Conflict of Interest:** None declared.