
ORIGINAL ARTICLE

A Comparison of Two Invasive Techniques Unilateral and Bilateral Celiac Plexus Block in The Management of Relieving Pain in Advanced Upper Abdominal Cancer Patients

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ABSTRACT

Objectives: To compare the effectiveness of two invasive techniques of pain relief treatment with celiac block.

Methodology: This is a randomized control trial study, carried out in the Department of Anaesthesiology, Shaikh Zayed Hospital Lahore, during a period of 1 year from January 2012 to January 2013. The data was entered in SPSS version 19 and analyzed. The student t test was applied for induction of hypotension after celiac block and Chi-square test was applied for pain with coin scale. Both male and female patients of 15->65 years of age. The study comprised of 100 patients, 50 in each group. P value <0.05 is considered as significant.

Results: The mean age of patients was 55.10±12.5 in group A (bilateral group) and 53.15±11.3 years in group B (unilateral group). Fifty three patients were male and 47 patients were female in both groups. According to pain scale reported by National Institutes of Health, 13 (26%) patients had mild pain relief in group A and 12 (24%) in group B, 12 (24%) patients had moderate pain relief in group A and 13 (26%) in group B, while 25 (50%) patients had decrease in the maximum pain relief intensity in group A and also 25 (50%) in group B.

Conclusion: It is concluded that maximum pain relief 50% in group A while 50% in group B. Induction of hypotension after celiac block upto 50%, there were 60% patients in group A and only 10% patients in group B.

Key Words: Celiac plexus block, Cancer, CT guided, Neurolysis.

INTRODUCTION

The celiac plexus or coeliac plexus, also known as the solar plexus because of its radiating nerve fibers is a complex network of nerves (a plexus) located in the abdomen, whereas the celiac trunk, superior mesenteric artery, and renal arteries branch from the abdominal aorta. It is behind the stomach and the omental bursa, and in front of the crura of the diaphragm, on the level of the first lumbar vertebra, L1. The plexus is formed (in part) by the greater and lesser splanchnic nerves of both sides, and also parts of the right vagus nerve. The celiac plexus proper consists of the celiac ganglia with a network of interconnecting fibers. The aorticorenal ganglia are often considered to be part of the celiac ganglia, and thus, part of the plexus.¹

A celiac plexus block by means of fluoroscopy or under computed tomography (CT) guided injection is used to treat intractable pain from cancers such as pancreatic cancer. Frequently,

celiac plexus block is performed by pain management specialists and radiologists, with CT scans for guidance. Intractable pain related to chronic pancreatitis is an important indication for celiac plexus ablation.¹

Most commonly, celiac plexus blocks have been used to treat the chronic abdominal pain associated with pancreatic cancer and have been reported to provide good or excellent pain relief in up to 85% of patients.^{2,3} Pain related to gastric cancer, esophageal cancer, colorectal cancer, liver metastasis, gallbladder cancer, and cholangiocarcinoma has also been treated effectively with a celiac plexus block.⁴ The success rate of the procedure for palliative relief of all types of upper gastrointestinal cancer pain has been reported to be between 70% and 97%, regardless of the technique used.⁵ In the pediatric population, there have been case reports of celiac plexus blocks for palliative pain management in patients with neuroblastoma and hepatoblastoma.⁶ Celiac

plexus blocks have also been reported to effectively control pain in patients undergoing major interventional biliary procedures.⁷

Celiac plexus block is an established method of treatment for pain associated with pancreatitis and intraabdominal cancer. However, it also results in decreased sympathetic efferent activity in fibers supplying the intraabdominal organs.⁸ In advanced stages of cancer, the celiac block can greatly help in pain control and result in relative improvement of patient's condition.⁹⁻¹¹

METHODOLOGY

The Ethical Committee of the hospital approved the study, after that a written informed consent was obtained from the patient whenever possible or from the next of kin. The study period was 1 year from January 2012 to January 2013. Two groups of patients suffering from pain due to inoperable pancreatic cancer were treated were made depending upon the type of celiac block application. The choice of treatment was based on the decision related to patient's extent disease and haemodynamic status. With all monitoring done, patient should be in prone position. The structure around celiac plexus is abdominal aorta and inferior vena cava. Twelfth rib is identified along with L1 vertebra carefully with the help of radiograph, then we introduce the needle at 45° towards anterior to the L1 vertebra body. After negative aspiration 2% xylocain is introduced after confirmation of pain relief from the patient then 15ml of 50% alcohol infiltrate at the same place. Then we will give 2-3ml of distal water to avoid sinus formation. Patient kept in prone position for ½ hour. During that time vital should be monitored every 5 minutes for 15 minutes for 2 hour then half hourly upto fast tracking of the patient. Pain relief is checked with help of pain scale narrated by patient and also the patients comfort status. The data was entered in SPSS 19 and analyzed. The t test was applied for induction of hypotension after celiac block and Chi-square test was applied for pain with coin scale. P value <0.05 is considered as significant.

RESULTS

The mean age of patients was 55.10±12.5 in group A (bilateral group) and 53.15±11.3 years in group B (unilateral group). Most of the patients were in age group of 36-65 year, in group A 39 (78%) and in group B 38 (76%) while >65 years there were only 6 (12%) in group A while 8 (16%) in group B

(Table 1). In this study 54% patients were male in group A and 52% in group B while (46%) patients were female in group A and 48% in group B (Table 2). According to visual analogue scale, range from 0-10, 5 (10%) from 0-3 visual analogue scale in group A and 5 (10%) in group B, 16 (32%) patients from 4-5 in group A and 15 (30%) in group B, 18 (36%) between 6-8 in group A and also 20 (40%) in group B, while 12 (24%) patients between 9-10 in group A and 10 (20%) in group B (Table 3).

Table 1: Age Distribution of Patients (n=100)

Age in years	Group A (n=50)	Group B (n=50)
15 – 35	5 (10%)	4 (8%)
36 – 65	39 (78%)	38 (76%)
>65	6 (12%)	8 (16%)
Total	50 (100%)	50 (100%)

Group A = Bilateral Group B = Unilateral

Table 2: Sex Distribution of Patients (n=100)

Sex	Group A (n=50)	Group B (n=50)
Male	27 (54%)	26 (52%)
Female	23 (46%)	24 (48%)

Table 3: Frequency of Visual Analogue Scale for Pain (n=100)

Visual Analogue Scale	Group A (n=50)	Group B (n=50)
0 – 3	4 (8%)	5 (10%)
4 – 5	16 (32%)	15 (30%)
6 – 8	18 (36%)	20 (40%)
9 – 10	12 (24%)	10 (20%)

Table 4: Frequency of decrease in pain with coin scale

Pain Scale	Group A (n=50)	Group B (n=50)
Mild	13 (26%)	12 (24%)
Moderate	12 (24%)	13 (26%)
Maximum	25 (50%)	25 (50%)

There were 13 (26%) patients mild pain relief in group A and 12 (24%) in group B, 12 (24%)

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patients had moderate pain relief in group A and 13 (26%) in group B, while 25 (50%) patients had decrease the maximum pain relief intensity in group A and also 25 (50%) in group B (Table 4). Chi-square test was applied with a p value 1.00 which is statistically not significant. Table 5 shows the induction of hypotension after celiac block in both groups. The mean±SD was 40.36±7.31 in group A and 29.42±7.43 in group B with a p value <0.05 which is statistically significant and t test was applied. There were 5 (10%) patients had hypotension from 20-30% in group A and 35 (70%) patients had hypotension in group B, there were 15 (30%) patients had 30-40% hypotension after induction of injection in group A and 10 (20%) in group B, while 30 (60%) patients had upto 50% hypotension in group A and only 5 (10%) patients in group B.

Table 5: Induction of hypotension after celiac block in unilateral and bilateral intervention

Hypotension	Group A (n=50)	Group B (n=50)
20 - 30%	5 (10%)	35 (70%)
30 - 40%	15 (30%)	10 (20%)
Upto 50%	30 (60%)	5 (10%)

DISCUSSION

The celiac plexus block is an established method of treatment for pain associated with pancreatitis and intraabdominal cancer. However, it also results in decreased sympathetic efferent activity in supplying the intraabdominal organs. In this study, we used celiac block in critically ill patients when intravenous drug therapy failed to improve gastroenterology dysfunction.

Both techniques of celiac plexus block have shown to provide significant benefit for the patients. The current results once more demonstrate that both methods result in a significant short-term pain relief and improvement in quality of life. Achieving a reduction in patients' pain scores may improve their mood and further activity and longevity. In a study carried out by Staats et al the neurolytic block, as compared with medical management alone, not only improved pain, elevated mood, reduced pain interference with activity, but also, what is most encouraging, was associated with an increase in life expectancy.¹²

In a study reported by Ross after the celiac plexus block, the patient had adequate pain relief.¹³ Assuming correct needle tip positioning, the most important reason for failure of a celiac plexus block is regional tumor infiltration or scar tissue and fibrosis that distort the anatomy, limiting access to the celiac plexus.

In a study reported by Yarmohammadi, multiple methods have been reported to be effective in relieving pain of celiac plexus involvement which is comparable with our study.¹⁴ Haaga et al performed CT-guided bilateral and unilateral celiac ganglia block in patients with pain secondary to pancreatic cancer and reported with satisfactory results.¹⁵ Rykowski and Hilgier reported that unilateral transcral celiac plexus neurolysis provides effective pain relief in patients with pancreatic cancer pain which is comparable with our study.¹⁶

In a study reported by Dilek⁸ the mean age of patients were 67.3±19.6 in group A and 63.3±20.4 years in group B and in the same study the male to female ratio were 6:4 5:4. In the present study the mean age of patients were 55.10±12.5 in group A and 53.15±11.3 in group B which is comparable with a slight difference. Another study carried out by Farrar, the mean age of the patients were 63.4 in group A and 62.6 group B which is comparable with our study.¹⁷

In this study 27 (54%) were male patients in group A and 26 (52%) patients in group B while 23 (46%) female patients in group A and 24 (48%) patients in group B. A study described by Farrar, there were 29 male patients in group A and 24 in group B while 21 female patients in group A and 26 patients in group B which is comparable with our study.¹⁷

In our study there was induction of hypotension after celiac block in both groups. There was 20-30% reduction of blood pressure in 10% in group A and 70% in group B. Hypotension from 30-40%, 30% in group A while 20% in group B and upto 50%, 60% in group A while only 10% in group B so unilateral group showed better results as compare to bilateral group.

CONCLUSION

The pain relief with fewer complications was observed in unilateral celiac block. It provides more haemodynamic control regarding hypotension as compared to bilateral celiac block. It is concluded that unilateral technique is better than bilateral because it is more effective in

controlling haemodynamic changes like hypotension of patients.

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