ORIGINAL ARTICLE

Comparison of Effectiveness and Complications with two Strengths of Dilution of Alcohol in Celiac Plexus Block in the Management of Relieving Pain

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ABSTRACT

Background: The celiac plexus is a complex network of nerves located in the abdomen, in close relation to the celiac trunk, superior mesenteric artery and renal arteries branching from the abdominal aorta. A celiac plexus block by means of fluoroscopy or under computed tomography guided injection is utilized to treat intractable pain from cancers like pancreatic cancer.
Aim: To compare the effectiveness and complications with two strengths of dilution of alcohol in celiac plexus block in the management of relieving pain.
Methodology: This is a randomized control trial study, carried out in the Department of Anaesthesiology, Shaikh Zayed Hospital Lahore, from 15-06-2017 to 14-06-2018. The student t test was applied for celiac block and Chi-square test was applied for pain with coin scale. Both male and female patients were included in this study.
Results: The mean age of patients was 57.10±11.4 in group A (50% dilution) and 52.14±12.4 years in group B (100% dilution). Fifty four percent were male and 46% were female in group A and 52% male and 48% were female patients in group B. 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 with 100% dilution the rate of complication like backache, diarrhea, hypotension are more as compare to 50% dilution, as pain relief will be equal with both dilutions.
Keywords: Celiac plexus block, Effectiveness, Complications.

INTRODUCTION

The celiac plexus is located in the abdomen, posterior to stomach and omental bursa and anterior to crura of the diaphragm, at the level of the first lumbar vertebra, near the celiac trunk, superior mesenteric artery and renal arteries branching from the abdominal aorta. This complex network of nerves with radiating fibers is also known as solar plexus, and is formed by right and left greater and lesser splanchnic nerves and parts of right vagus nerve[1].

A celiac plexus block is used to treat intractable pain from cancers like pancreatic cancer, under fluoroscopy or computed tomography guided injection. Studies show that it provides adequate pain relief in up to 85% patients.[2,3] It is also effective in relieving pain due to gastric cancer, esophageal cancer, gallbladder cancer, liver metastasis, colorectal cancer and cholangiocarcinoma and chronic pancreatitis.[1,4] Celiac plexus block is performed by pain management experts and radiologists, with CT scans for direction.

Lower concentration of alcohol for celiac plexus ablation will lead to lower intensity of complications, so 50% dilution will be preferred over 100% dilution in our study. The procedure success rate for palliative relief of all types of upper gastrointestinal cancer pain has been reported between 70% and 97%, regardless of the technique used.[5] In pediatric population, there have been reported of celiac plexus blocks for palliative pain treatment in patients with neuroblastoma and hepatoblastoma[6]. Celiac plexus block is also effective as a pain relieving modality in patients undergoing major interventional biliary procedures[7].

Celiac plexus block is an established method of treatment for pain associated with pancreatitis and intra-abdominal cancer. In advanced stages of cancer, the celiac block can greatly help in pain control and result in relative improvement of patient's condition[8-10]. However, it also results in decreased sympathetic efferent activity in fibers supplying the intra-abdominal organs[11].

METHODOLOGY

The Ethical Committee of the hospital approved the study and informed consent was signed by the patients or their guardians. The study period was 1 year from 15-06-2017 to 14-06-2018. Two groups of patients suffering from pain due to inoperable pancreatic cancer were created depending upon the type of celiac block application. The choice of treatment was based on the decision related to patient's extent of disease and hemodynamic status. With all monitoring done, patient was placed in prone position. The

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structure around celiac plexus is abdominal aorta and inferior vena cava. Twelfth rib was identified along with L1 vertebra carefully with the help of radiograph and then we introduced the needle at 45° anterior to the L1 vertebra body. After negative aspiration 2% xylocain was introduced after confirmation of pain relief from the patient, then 15ml of 50% or 100% alcohol were infiltrated at the same place. Then we gave 2-3ml of distal water to avoid sinus formation. Patient was kept in prone position for 30 minutes. During that time vitals were monitored every 5 minutes for 2 hours then half hourly upto fast tracing of the patient. Pain relief was checked with help of pain scale narrated by patient and also the patient's comfort status.

RESULTS

The mean age was 57.10±11.4 in group A (50% dilution) and 52.14±12.4 years in group B (100% dilution). The patients in age group between 35-65 years were 39 (78%) in group A, and 38 (76%) in group B. Patients in the age group of >65 years of age were 6 (12%) in group A, and 8 (16%) in group B (Table 1). Regarding gender division, 54% patients were male in group A and 52% in group B, whereas, (46%) patients were female in group A and 48% in group B (Table 2). According to visual analogue scale, range from 0-10, 4 (8%) from 0-3 visual analogue scale in group A and 5 (10%) in group B, 16 (32%) patients from 4-5 score in group A and 15 (30%) in group B, 18 (36%) between 6-8 score in group A and 20 (40%) in group B, while 12 (24%) patients between 9-10 in group A and 10 (20%) in group B (Table 3). There were 13 (26%) patients with 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 decreased maximum pain intensity in group A and also 25 (50%) in group B (Table 4). Table 5 shows the frequency of complications in Group A. 32 (64%) patients had severe backache, diarrhea and hypotension, 14 (28%) had mild back pain, severe diarrhea and hypotension while 4 (8%) patients had mild back pain, diarrhea and hypotension. Table 6 shows the frequency of complications in Group B. 35 (70%) patients had mild backache, no patient had complaint of diarrhea and 35 (70%) patients had mild hypotension, 10 (20%) had mild back pain, no complaint of diarrhea in any patient and mild hypotension while 5 (10%) patients had mild back pain, severe diarrhea and mild hypotension, which is better result in comparison of 100% celiac block.

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%)**

Table 2: Sex distribution of patients (n=100)

Sex	Group A	Group B
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	Group B
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 pain with coin scale (n=100)

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

Table 5: Frequency of complications in group A (n=100)

No	%	Backache	Diarrhea	Hypotension
32	64.0	++	++	++
14	28.0	+	++	++
4	8.0	+	+	+

Table 6: Frequency of Complications in Group B (n=100)

No.	%	Backache	Diarrhea	Hypotension
35	70.0	+	-	+
10	20.0	±	-	±
5	10.0	+	++	±

DISCUSSION

The celiac plexus block is a set up technique for management for pain related with pancreatitis and intra-abdominal cancer. However, the results in decreased sympathetic efferent activity in supplying the intra-abdominal organs. In this study, we used celiac block in critically ill patients when intravenous drug therapy failed to improve gastroenterology dysfunction.

The two dilutions of celiac plexus block have appeared to provide significant benefit for patients. The present results again show that the both dilutions result in a significant short-term pain relief and improvement in life quality. Accomplishing a decrease in patients' pain scores may improve their state of mind and further activity and longevity.

In a study reported by Ross after the celiac plexus block, the patient had adequate pain relief[12]. Assuring 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.

Yarmohammadi et al, reported various strategies have been effective in relieving pain of celiac plexus involvement which is comparable with our study.13 Haaga et al, performed CT-guided bilateral and unilateral celiac ganglia block in patients with pain secondary to pancreatic cancer and reported satisfactory results.14 Rykowski et al reported that unilateral transcrural celiac plexus neurolysis provides effective pain relief in patients with pancreatic cancer pain which is comparable with our study[15].

In a study reported by Dilek[8] 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. The mean age of patients was 57.10±11.4 in group A and 52.14±12.4 in group B which is comparable with a slight difference. In another study carried out by Farrar, the mean age of the patients was 63.4 in group A and 62.6 in group B which is comparable with our study[16].

The patient complications encountered in our study were hypotension, diarrhea and backache. In group A, 64% had severe hypotension, diarrhea and backache. 28% had moderate degree of hypotension, and 8% had mild symptoms. In group B, 70% patients had only mild fall in blood pressure, 30% had little or no hypotension and only 10% had complaint of diarrhea. So, 50% dilution group showed better results as compared to 100% dilution group.

CONCLUSION

The pain relief with fewer complications was observed in 50% dilution celiac block. It provides more hemodynamic control regarding hypotension as compared to 100% dilution celiac block. It is concluded that 50% dilution is better than 100% dilution because there would be lesser risk of complications.

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