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Outcome of Neurolytic Coeliac Plexus Block for the Relief of Pain due to Carcinoma of Pancreas: An Observational Study

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Abstract **Original Research Article**

Introduction: For both patients and their families, the most concerning aspect of cancer is pain. Neurolytic Coeliac Plexus Block can be used to relief the pain of the patients with pancreatic carcinoma. ***Aim of the Study:*** The aim of this study was to assess the outcome of neurolytic coeliac plexus block for the relief of pain due to carcinoma of pancreas. ***Methods:*** This cross-sectional study was conducted in Department of Anaesthesia, Bangabandhu Sheikh Mujib Medical College, Dhaka, Bangladesh, during the period from July 2008 to June 2010. Total 50 patients with carcinoma pancreas were included in this study. ***Result:*** In this study, in group A and B the mean ± SD pain in VAS before treatment are 8.80±0.86 & 8.07±1.44 respectively. At 1st, 2nd, 7th and 15th day of treatment the mean pain in VAS of group A & group B are (2.30± 0.98 & 5.53±0.99); (2.27 ± 0.70 & 5.60 ± 1.24); (2.13± 1.13 & 6.07±1.16) and (2.27 ± 1.39 &6.40 ± 0.74) respectively. Before starting the treatment, mild anorexia was found in 7(28%) & 8(32%) cases among group A & B. Moderate anorexia was found in 10(40%) cases and 7(28%) cases in group A and group B respectively. Severe anorexia was seen in 8(32%) cases and 10(40%) cases in group A and group B respectively. In 1st day of treatment mild anorexia was found in 9(36%) and 7(28%) cases in group A and group B respectively. Moderate anorexia was found in 8(32%) and 10(40%) cases in group A and group B respectively. Anorexia was found absent by 8(32%) in both groups. At 15th day of treatment, we found mild anorexia was present in 13(52%) & 2(8%); moderate anorexia was 8(32%) & 13(52%) in group A & B respectively. Severe anorexia was found in 10(40%) cases in group B and absent in group A. Anorexia was absent in 3(12%) cases in group A and 2(8%) in group B. In group A majority of patients had moderate vomiting 10(40%) & severe vomiting 8(32%) and in group B majority of them had severe vomiting 10(40%), mild vomiting 8(32%) before starting treatment. Before starting treatment, sleep disturbance was severe in 8(32%) & 10(40%) patients in group A & B respectively. After 15th day of treatment, we found severe sleep disturbance was 12% in group B on the other hand sleep disturbance was absent in 12% in group A respectively. ***Conclusion:*** There was statistically significant reduction of pain using Neurolytic Coeliac Plexus Block for Carcinoma of Pancreas. Adverse effects of NCPB were common but transient and mild and severe adverse effects are uncommon.

Keywords: Neurolytic Coeliac Plexus Block, Relief of Pain and Carcinoma of Pancreas.

I. INTRODUCTION

The aggressive tumor known as pancreatic adenocarcinoma is known for having a high fatality rate. One of the main therapeutic goals is to improve the quality of life (QOL) by controlling symptoms, particularly by providing sufficient pain control, as up to 73% of patients are in pain at the time of diagnosis [1]. The prognosis of pancreatic cancer is poor to moderate despite potential surgical surgery, radiation therapy, and chemotherapy treatments [2, 3]. Thus, for the majority of patients with this condition, controlling the symptoms of pancreatic cancer and its progression constitutes a top priority for therapy [4, 5]. Early in the course of the disease, pain is commonly experienced [6]. It frequently transforms from an upper abdomen visceral discomfort to take on new features and location [7, 8]. Pancreatic cancer pain has been treated with a variety of methods up to this point, including

pharmaceutical, radiation, neuroinvasive, and neurolytic techniques [8-12]. The World Health Organization analgesic ladder recommends using systemic medications to treat cancer pain [13]. Sometimes, however, systemic analgesics are insufficient to treat pain or are only effective in small doses due to opioid-related side effects [14]. In these cases, celiac plexus or splanchnic nerve blocks with neurolytic solutions may be used to treat pain by preventing the transmission of visceral afferent pain from the upper abdomen [15]. However, randomized clinical trials evaluating the efficacy of neurolytic celiac plexus block (NCPB) for pancreatic cancer pain have been limited by small sample sizes, lack of blinding, infrequent pain assessments, or lack of standardized delivery of systemic analgesic medications [16, 17]. Indeed, the role of neurolytic blocks in the management of any type of cancer pain has not been firmly established by randomized, blinded clinical trials. Some authors consider the use of the NCPB to be optimal [17-21]. This technique has been used for many years in the treatment of pain caused by upper abdominal malignancy [21]. Although the role of this technique has been established in the literature, few controlled trials have compared its efficacy with that of other types of treatment [22]. A NCPB could continue longer than the median survival period of 6 months after pancreatic cancer diagnosis, which is predicted to be >3-6 months [23-26]. However, there may be some pancreatic cancer patients who receive analgesia from NCPB for a certain time interval, but then experience a return of worsening of pain, which may be due to incomplete destruction of nerve fibers and ganglia after using alcohol for neurolysis [27]. If needed, the celiac plexus block can be repeated in the future. In contrast to patients with extensive tumor development, the analgesic effects of NCPB may be more effective in cases where the tumor involves the head of the pancreas. It has been investigated whether placing a celiac catheter will increase the effectiveness of NCPBs [28]. Although a recent study compared early and late sympathetic neurolytic blocks with pharmacotherapeutic intervention in advanced cancer patients and found no significant differences between the early and late block groups, the celiac plexus blocks should be taken into consideration earlier in the disease [24, 29, 30]. There are very few studies about the outcome of neurolytic coeliac plexus block for the relief of pain due to carcinoma of pancreas. Thus, the current study was conducted to assess the outcome of neurolytic coeliac plexus block for the relief of pain due to carcinoma of pancreas.

II. OBJECTIVES

To assess the outcome of neurolytic coeliac plexus block for the relief of pain due to carcinoma of pancreas.

III. METHODOLOGY & MATERIALS

This cross-sectional study was conducted in Department of Anaesthesia, Bangabandhu Sheikh Mujib Medical College, Dhaka, Bangladesh, during the period from July 2008 to June 2009. Total 50 patients with carcinoma pancreas were included in this study of which 25 were in the group A who were treated with the neurolytic celiac plexus block (NCPB) and 25 were in the group B who were treated with conventional analgesic drugs. Consent of the patients and guardians were taken before collecting data. After collection of data, all data were checked and cleaned. After cleaning, the data were entered into computer and statistical analysis of the results being obtained by using windows-based computer software devised with Statistical Packages for Social Sciences version 22. After compilation, data were presented in the form of tables, figures and charts, as necessary. Numerical variables were expressed as mean and standard deviation, whereas categorical variables were count with percentage. P value of less than 0.05 was considered statistically significant.

Inclusion Criteria

- All age groups.
- Patients with both sexes.
- Smokers.
- All patients suffering from pain due to pancreatic carcinoma.
- Participants, who gave consent and willing to comply with the study procedure.

Exclusion Criteria

- Major cardiac disease.
- Uncontrolled DM.
- Coagulopathy.
- Patients with known allergy to study drugs.
- Severely ill patients.
- Patients or attendants unwilling to take part in the study.

IV. RESULT

Table I demonstrates the demographics & baseline characteristics. In our study, the majority (52% & 60%) of our patients were aged between 41-60 years in both group A and group B. The mean age in the group A and group B patients were 48.73 ± 14.26 years and 51.47 ± 12.35 years respectively. Majority of our patients were male (68%) in group A. Most of the study people (64%) were also male in group B. Among 30 cases in group A mostly was service holder which was 13(52%) cases. Among 30 cases in group B mostly were service holder which was 10(40%). In group A & B majority were graduate and above which was 15(60%) & 13(52%) respectively. The difference is not statistically significant. Table II shows the comparison of pain in Visual Analog Scale (VAS) between two groups. In group A in group A and B the mean ± SD pain in VAS before treatment are 8.80±0.86 &

8.07±1.44 respectively. At 1st ,2nd ,7th and 15th day of treatment the mean pain in VAS of group A & group B are (2.30± 0.98 & 5.53±0.99); (2.27 ± 0.70 &5.60 ± 1.24); (2.13± 1.13 & 6.07±1.16) and (2.27 ± 1.39 &6.40 ± 0.74) respectively. Table III demonstrates the adverse effects of before & after treatment between two groups. Before starting the treatment, mild anorexia was found in 7(28%) & 8(32%) cases among group A & B. Moderate anorexia was found in 10(40%) cases and 7(28%) cases in group A and group B respectively. Severe anorexia was seen in 8(32%) cases and 10(40%) cases in group A and group B respectively. In 1st day of treatment mild anorexia was found in 9(36%) and 7(28%) cases in group A and group B respectively. Moderate anorexia was found in 8(32%) and 10(40%) cases in group A and group B respectively. Anorexia was found absent by 8(32%) in both groups. At 15th day of treatment, we found mild anorexia was present in 13(52%) & 2(8%); moderate anorexia was 8(32%) & 13(52%) in group A & B respectively. Severe anorexia was found in 10(40%) cases in group B and absent in group A. Anorexia was absent in 3(12%) cases in group A and 2(8%) in group B. In group A majority of patients had moderate vomiting 10(40%) & severe vomiting 8(32%) and in group B majority of them had severe vomiting 10(40%), mild vomiting 8(32%) before starting treatment. At 2nd & 7th day of treatment vomiting was absent in group A but in group B severe was seen 28% & 24%; moderate was seen 32% & 40% respectively. At 15th day of treatment vomiting was absent in 12%; mild was seen in 60% in group A while in group B mild was 32% & severe was 12% respectively. Before starting treatment, sleep disturbance was severe in 8(32%) & 10(40%) patients in group A & B respectively. After 15th day of treatment, we found severe sleep disturbance was 12% in group B on the other hand sleep disturbance was absent in 12% in group A respectively.

Table-I: Demographic characteristics of the study people. (N=50)

Demographics characteristics	Group A (NCB)		Group B (Conventional)		P-value
	n	%	n	%	
Age (in years)					
≤20 years old	2	8	1	4	
21-40 years old	3	12	1	4	
41-60 years old	13	52	15	60	
>60 years old	7	28	8	32	
Mean ± SD	48.73 ± 14.26		51.47 ± 12.35		0.579
Gender					
Male	17	68	16	64	0.999
Female	8	32	9	36	
Occupation					
Housewife	5	20	5	20	0.449
Business	3	12	6	24	
Service	13	52	10	40	
Student	2	8	2	8	
Other	1	4	2	8	
Educational Qualification					
Primary	2	8	3	12	0.659
Secondary	3	12	3	12	
Higher secondary	5	20	6	24	
Graduate and above	15	60	13	52	

Table-II: Comparison of pain in VAS between Group A & Group B.

Pain in VAS	Group A (NCB)	Group B (Conventional)	P-value
Before treatment	8.80±0.86	8.07±1.44	0.101
1st day	2.30±0.98	5.53±0.99	0.001
2nd day	2.27±0.70	5.60±1.24	0.001
7th day	2.13±1.13	6.07±1.16	0.001
15thday	2.27±1.39	6.40± 0.74	0.001

Table-III: Adverse effects of before & after treatment between Group A & B

Adverse effects	Group A (NCB)				Group B (Conventional)				P-value
	None	Mild	Moderate	Severe	None	Mild	Moderate	Severe	
Anorexia									
Before treatment	0(0%)	7(28%)	10(40%)	8(32%)	0(0%)	8(32%)	7(28%)	10(40%)	0.001
1st day	8(32%)	9(36%)	8(32%)	0(0%)	8(32%)	7(28%)	10(40%)	1(4%)	0.458
2nd day	7(28%)	5(20%)	10(40%)	3(12%)	9(36%)	1(4%)	8(32%)	7(28%)	0.128
7th day	5(20%)	6(24%)	12(48%)	3(12%)	3(12%)	7(28%)	10(40%)	6(24%)	0.027
15th day	3(12%)	13(52%)	8(32%)	0(0%)	0(0%)	2(8%)	13(52%)	10(40%)	0.014
Vomiting									
Before treatment	0(0%)	7(28%)	10(40%)	8(32%)	0(0%)	8(32%)	7(28%)	10(40%)	0.676
1st day	0(0%)	18(72%)	6(24%)	2(8%)	8(32%)	7(28%)	10(40%)	1(4%)	0.032
2nd day	25(100%)	0(0%)	0(0%)	0(0%)	9(36%)	1(4%)	8(32%)	7(28%)	0.004
7th day	25(100%)	0(0%)	0(0%)	0(0%)	3(12%)	7(28%)	10(40%)	6(24%)	0.008
15th day	3(12%)	15(60%)	7(28%)	0(0%)	0(0%)	8(32%)	13(52%)	3(12%)	0.004
Sleep disturbance									
Before treatment	0(0%)	7(28%)	10(40%)	10(40%)	0(0%)	8(32%)	7(28%)	10(40%)	0.865
1st day	25(100%)	0(0%)	0(0%)	0(0%)	8(32%)	7(28%)	10(40%)	1(4%)	0.126
2nd day	25(100%)	0(0%)	0(0%)	0(0%)	9(36%)	1(4%)	8(32%)	7(28%)	0.003
7th day	5(20%)	6(24%)	12(48%)	3(12%)	3(12%)	7(28%)	10(40%)	6(24%)	0.016
15th day	3(20%)	13(52%)	8(32%)	0(0%)	0(0%)	8(32%)	13(52%)	3(12%)	0.007

V. DISCUSSION

In our study, majority (52% & 60%) of our patients were aged between 41-60 years in both group A and group B. The mean age in the group A and group B patients were 48.73 ± 14.26 years and 51.47 ± 12.35 years respectively. Similar result was found by Wang *et al.,* [31] and stated that the majority of pancreatic cancer were seen in the age group of 60 years and older. In another study it was found that the risk of pancreatic cancer goes up with age. The disease is rare in people under 45, and the average age when the disease is found is 72. Anand *et al.,* [32] mentioned that those aged 60-80 years are most affected. They also added that the pancreatic adenocarcinoma is uncommon but not rare in those younger than 55 years. It is uncommon in those younger than 40 years which is consistent with our study. Majority of our patients were male (68%) in group A. Most of the study people (64%) were also male in group B. In the study of Anand *et al.,* [32], it was mentioned that pancreatic cancer is more common in men than in women. They also added that the male-to-female ratio has been decreasing recently, suggesting that more women are developing the malignancy. Another study also found a similar result and demonstrated that the rate was higher in men than in women [31]. Among 30 cases in group A mostly was service holder which was 13(52%) cases. Among 30 cases in group B mostly were service holder which was 10(40%). In group A & B majority were graduate and above which was 15(60%) & 13(52%) respectively. The difference is not statistically significant. In this study the mean ± SD pain in VAS of group A & B before treatment are 8.80±0.86 & 8.07±1.44 respectively. At 1st, 2nd, 7th and 15th day of treatment the mean pain in VAS of group A & group B are (2.30± 0.98 & 5.53±0.99); (2.27 ± 0.70 &5.60 ± 1.24); (2.13± 1.13 & 6.07±1.16) and (2.27 ± 1.39 &6.40 ± 0.74) respectively. Similar result was found by Moore and Adler [33] and mentioned that VAS scores in the CPN group were statistically lower for the first 4 weeks after the procedure than in the NSAID-morphine group. Opioid use was significantly lower in the CPN group at 4 to 7 weeks. At 10 weeks, opioid use was lower, but not significantly, in the CPN group. CPN was associated with lower VAS scores for pain at 2, 4, and 8 weeks. Yan and Myers [34] were found a similar result and demonstrated that in patients with unresectable pancreatic cancer, NCPB is associated with improved pain control, and reduced narcotic usage compared with standard treatment. This result is consistent with this study. In the current study, before starting the treatment, mild anorexia was found in 7(28%) & 8(32%) cases among group A & B. Moderate anorexia was found in 10(40%) cases and 7(28%) cases in group A and group B respectively. Severe anorexia was seen in 8(32%) cases and 10(40%) cases in group A and group B respectively. In 1st day of treatment mild anorexia was found in 9(36%) and 7(28%) cases in group A and group B respectively. Moderate anorexia was found in 8(32%) and 10(40%) cases in group A and group B respectively. Anorexia was found absent by 8(32%) in both groups. At 15th day of treatment, we found mild

anorexia was present in 13(52%) & 2(8%); moderate anorexia was 8(32%) & 13(52%) in group A & B respectively. Severe anorexia was found in 10(40%) cases in group B and absent in group A. Anorexia was absent in 3(12%) cases in group A and 2(8%) in group B. In group A majority of patients had moderate vomiting 10(40%) & severe vomiting 8(32%) and in group B majority of them had severe vomiting 10(40%), mild vomiting 8(32%) before starting treatment. At 2nd & 7th day of treatment vomiting was absent in group A but in group B severe was seen 28% & 24%; moderate was seen 32% & 40% respectively. At 15th day of treatment vomiting was absent in 12%; mild was seen in 60% in group A while in group B mild was 32% & severe was 12% respectively. Before starting treatment, sleep disturbance was severe in 8(32%) & 10(40%) patients in group A & B respectively. After 15th day of treatment, we found severe sleep disturbance was 12% in group B on the other hand sleep disturbance was absent in 12% in group A respectively. Similar result was found by Kawamata *et al.*, [35] and stated that CPB was performed within 2-3 days after the control measurement. Morphine consumption was significantly lower in weeks 4-7 (inclusive) following the procedure in the CPB group and continued to be lower thereafter. Self-assessed QOL scores did not ameliorate statistically after CPB; however, they did deteriorate remarkably in the patients treated only with morphine-NSAID during their survival periods, while they deteriorated only slightly in the CPB group. Recently, it has been shown that CPB reduces narcotic consumption for controlling pancreatic cancer pain and the occurrence of the side effects seen in the traditional NSAID-narcotic treatment [36]. Although CPB is a relatively safe procedure and common adverse effects of diarrhea and hypotension are mostly transient, severe complications including paraplegia has been reported [37-39]. When CPB is performed, the operators should be aware of these severe complications, and the patients should be warned about them.

Limitations of the Study

In our study, there was small sample size and absence of control for comparison. Study population was selected from one center in Dhaka city, so may not represent wider population. The study was conducted at a short period of time.

VII. CONCLUSION AND RECOMMENDATIONS

There was statistically significant reduction of pain using Neurolytic Coeliac Plexus Block for Carcinoma of Pancreas. Adverse effects of NCPB were common but transient and mild and severe adverse effects are uncommon. Further study with a prospective and longitudinal study design including larger sample size needs to be done to identify more adverse effects of NCPB and analgesics to relieve pain.

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