ORIGINAL RESEARCH ARTICLE

A Prospective Observational Study on use of Chemo-Port in Cancer Patients in a Tertiary Care Hospital

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ABSTRACT

Introduction: Implantable venous port catheter or chemo-port is commonly indicated in those with long term intravenous therapy, especially chemotherapy because effective and reliable venous access plays a major role in it. This study focuses on the use of implantable venous port catheter or chemo-port to cancer patients requiring multi-modality management and throws light on various aspects associated with chemo-ports.

Material and Methods: A total of 75 patients who underwent chemo-port insertion for various malignancy at oncology department in a tertiary care hospital were included in this prospective comparative study from June 2018 to January 2020. Parameters such as indication for chemo-port insertion, day of start of chemotherapy and complications were assessed.

Results: Chemo-port was inserted in 75 patients and was most commonly used in solid malignancies (n = 64 [85%]), followed by haematological malignancies (n = 11 [15%]). Breast cancer (n = 50 [66.6%]) was the most common underlying disease among the solid malignancies, whereas acute lymphoblastic leukaemia (n = 8 [10.6%]) was the most common underlying cause among the haematological malignancies for chemo-port insertion. Chemotherapy was started on the second day of chemo-port insertion in 50.6% of patients.

Conclusions: Chemo-port avoided multiple painful venipunctures made for administration of cytotoxic agents, antibiotics and blood products in already malnourished terminally ill patients with malignancy.

Keywords: Chemo-port, Insertion, Malignancy, Complications, Management.

INTRODUCTION

Multimodality management of malignancy involves chemotherapeutic agents which needs repeated and safe access to the venous system for the delivery of drugs, fluids, blood products and other nutritional supplements to terminally ill patients.[1] Chemo-port was first introduced by Niederhuber et al., in 1982 into clinical use, which were usually implanted subcutaneously in the chest wall.[2] The port system is built of a central catheter, which is inserted into a cannulated vein beneath the skin and attached to a port chamber that is placed into a subcutaneous pocket. Access of this totally implanted reservoir is possible with a special needle that allows puncture of the skin and silicone membrane of the port chamber. Chamber puncture has to take place under sterile conditions. These devices have decreased the patient anxiety associated with repeated venipunctures and due to the totally subcutaneous position, the port devices are invisible and are cosmetically more acceptable.[2] Advantages include less interference with daily activities, less frequent flushing, and reduced risk of infection. Disadvantages include the need for needle insertion, increased discomfort, and risk of extravasation. These devices are expensive and are more difficult and time-consuming to insert and remove but on the long run of chemotherapy, they have proved to be cost-effective.[3] This study focuses on the use of implantable venous port catheter or chemo-port to cancer patients requiring multi-modality management and throws light on various aspects associated with chemo-ports.

MATERIAL AND METHODS

This was a prospective comparative study with duration from June 2018 to January 2020. A total of 75 patients, who underwent chemo-port insertion for various malignancy at The Department of Oncology in Sri Ramakrishna Hospital were included in this study. Study was undertaken after the approval from the Hospital Ethics Committee. Informed written consent was taken from all the patients after explaining to them, the procedure and purpose of this study.

Methodology

All the patients with histopathologically or radiologically confirmed cases of malignancy who underwent chemo-port insertion were included in the study. They were interviewed

using a detailed questionnaire regarding their age, sex, clinical symptoms. History of any bleeding disorders were also asked. In our Institute, chemo-port insertion was performed under general anaesthesia in the operation theatre. The data were collected for underlying diseases for which chemo-port was inserted. Day of initiation of chemotherapy drug was also taken into account. They were followed up closely for any complications. The data were collected from the patient, for the complications related to chemo-port by various methods like through clinical symptoms, examination findings, and specific investigations, such as blood culture and doppler study. Clinical features like port site erythema, warmth, tenderness, discharge or collection were considered as chemo-port site infection. Chest radiograph was taken for each patient to rule out chemo-port catheter displacement or fracture. Whenever thrombosis related to chemo-port is suspected, venous doppler study was also taken. Finally statistical analysis was done with all the above mentioned parameters collected and they were assessed.

Inclusion criteria

All Patients with histopathological or radiological diagnosis of malignancy who underwent chemo-port insertion and those who were willing to be a part of the study.

Exclusion criteria

- Patients with bleeding disorders and those with low platelet count.
- Those who refuse to be a part of the study.

STATISTICAL ANALYSIS

Statistical analysis was performed by the Statistical Program for Social Sciences (SPSS) version 11.0 for Windows. Variables were expressed as mean, percentage and depicted in terms of bar diagrams, pie-charts and tables.

RESULTS

A total of 75 subjects with histo-pathological diagnosis of malignancy, who underwent chemo-port insertion were involved in this study for a duration of 20 months from June 2018 to January 2020. All the 75 patients received prophylactic antibiotics in the form of single-dose ceftriaxone 1 g intravenously, half an hour before the insertion of chemo-port.

Age and sex distribution of the study group

Of the 75 patients in the chemo-port study group, 11 (15%) were paediatric population (less than 14 years of age), 60 (80%) were in the adult (14-65 years) age group, and 4 (5%) were in the geriatric age (>65 years of age) (Figure 1). Women were the predominant population (n = 52, [69%]) whereas men were (n = 23, [31%]).

Diagnosis and various underlying diseases for chemo-port insertion

In our study group, chemo-port insertion was most commonly used in patients with solid malignancies (n = 64 [85%]), followed by haematological malignancies (n = 11 [15%]). Among the solid malignancies, breast cancer (n = 50 [66.6%]) was the most common underlying disease, whereas among the haematological malignancies, Acute

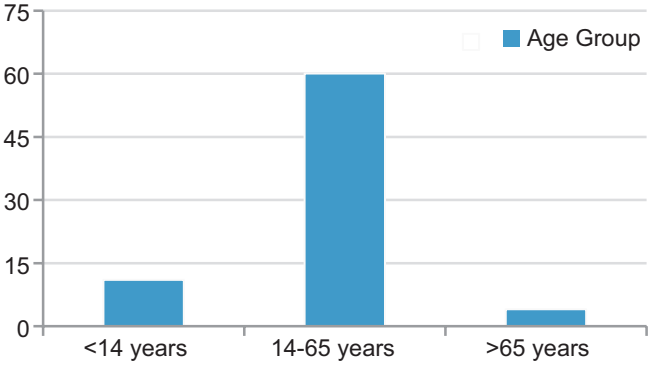

Figure-1: Association of age groups and patient requiring chemo-ports.

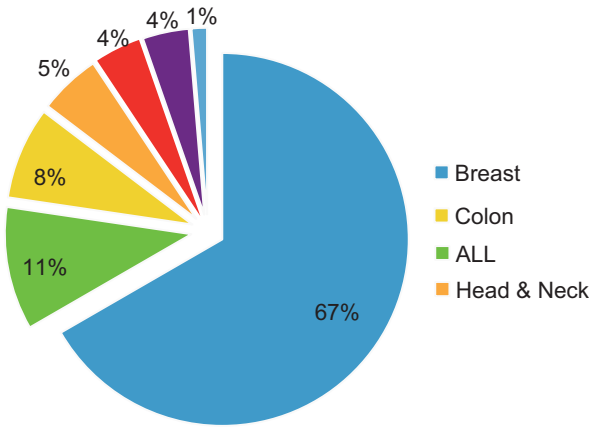

Figure-2: Various underlying diseases for which the patient requires chemo-ports.

S. No.	Complication	Percentage
1	Infection	(n = 4 [5%])
2	Catheter Displacement	(n = 1 [1.3%])
3	Catheter Fracture	(n = 1 [1.3%])
4	Thrombosis	NIL

Table-1: Various complications encountered while using chemo-ports.

Character	Jain et al[7]	Abraham et al[8]	Aparna et al[9]	MSKCC study[10]	Present study
No. of cases	25	81	200	680	75
Antibiotic prophylaxis	97%	100%	100%	100%	100%
Infection	7%	10%	12.5%	8%	5%
Catheter Displacement	NA	2%	0.5%	3%	1.3%
Catheter Fracture	NA	2.4	0.5	NA	1.3%
Thrombosis	0.4	6%	0.5%	2%	NA

Table-2: Comparison of present study results with various other studies.

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Lymphoblastic Leukaemia (ALL) (n = 8 [10.6%]) was the most common underlying disease for chemo-port insertion (Figure 2).

Of the 75 patients who underwent chemo-port insertion, (n = 5 [6.6%]) were started on chemotherapy on the first day of catheter insertion, (n = 38 [50.6%]) on second day of catheter insertion, (n = 18 [24%]) on third day of catheter insertion, and (n = 8 [10.6%]) on fourth day and (n = 6 [8%]) fifth day of catheter insertion.

Of the 75 patients, (n = 1 [1.3%]) developed early infection (30 days after chemo-port insertion) and another (n = 3 [4%]) developed late infection (30 days after chemo-port insertion). Of the 75 patients, (n = 1 [1.3%]) developed displacement of the chemo-port catheter, (n = 1 [1.3%]) developed fracture of the chemo-port catheter (Table 1).

DISCUSSION

With better understanding of the molecular genetics of malignancy, there is evolving methods in management of cancer patients. With the advent of multimodality treatment, there have been many new chemotherapeutic agents that have come into clinical practise. But, the most troublesome aspect of treatment of such patients is the multiple painful venipunctures made for administration of cytotoxic agents, antibiotics, blood products and nutritional supplements.[3] To overcome the problems of arteriovenous fistulae, peripherally inserted silicone catheters and implantable chemo-ports have been tried with varying success. The introduction of central venous lines in the 1980s significantly improved the quality of life (QOL) of oncology patients.[4] Placing these devices completely under the skin allows the patient to continue a normal life without special care, other than monthly heparinised serum infusion. According to the literature, the anterior upper chest wall is the most commonly used site, but abdomen, groin or ante-cubital area of the arm may also be used if there is disease involvement of the chest wall.[5] The introduction of any foreign object into the body, however, is accompanied by technical difficulties and the risk of developing complications.[6] In this study, an attempt is made to compare the present study results with the previous studies from the published literature. A study by Kumar et al[7] shows that there is male predominance in patients undergoing chemo-port insertion, but in our study there was a female predominance. A study by Patel et al[8] shows that the median age for chemo-port insertion is 24 years, but in our study, the median age was 38 years. The discordance may be due to the differences in the selection of the patients. Most of the researches on chemo-ports were retrospective in nature and we compared our study results with various other studies on implantable venous catheters like Jain et al[9], Abraham et al[10], Aparna et al[11] and an international study from Memorial Sloan Kettering Cancer Center[12] (Table 2). Our results were comparable with others in all aspects.

CONCLUSION

Chemo-ports are an effective means of administration of chemotherapeutic agents, antibiotics, blood products and nutritional supplements in already malnourished, terminally ill patients with malignancy without creating the anxiety of multiple venipunctures. Since very few studies on chemo-ports have been conducted from the Indian and Asian subcontinents, there is a lacunae in the knowledge and idea about these implantable venous port catheters or chemo-ports. Moreover, this study would form a basis on which further researches can be done.

REFERENCES

1. Reed WP, Newman KA, de Jongh C, Wade JC, Schimpff SC, Wiernik PH, McLaughlin JS. Prolonged venous access for chemotherapy by means of the Hickman catheter. Cancer. 1983;52(1):185-92.
2. Tabatabaie, O., Kasumova, G. G., Eskander, M. F., Critchlow, J. F., Tawa, N. E., & Tseng, J. F. Totally Implantable Venous Access Devices: A Review of Complications and Management Strategies. American journal of clinical oncology 2017;40(1):94–105.
3. Burney IA, Khurshaidi N, Akbar MT, Bhatti FN, Siddiqui T, Sophie Z. Complications of in-dwelling venous access devices: a single institution experience. Journal of Pakistan Medical Association. 2001;51(12):434.
4. Gyves J, Ensminger W, Neiderhuber J, et al. Totally implanted system for intra- venous chemotherapy in patients with cancer. Am J Med. 1982;73(5):841–845.
5. Viale PH. Complications associated with implantable vascular access devices in the patient with cancer. J Infus Nurs 2003;26(2):97-102
6. Eroglu E, Bulutçu E, Erçelen Ö. Unusual complications of the subcutaneous port catheter. The New Zealand Medical Journal (Online). 2008;121(1280).
7. Kumar AH, Srinivasan NM, Thakkar JM, Mathew S. A prospective observational study of the outcome of central venous catheterization in 100 patients. Anesth Essays Res. 2013;7(6):71–75.
8. Patel PM, Thakkar JM, Patel BM. Long term venous access catheter in cancer patients at GCRI. Guj Med J. 2010;65(2):1.
9. Jain SA, Shukla SN, Talati SS, et al. A retrospective study of central venous catheters GCRI experience. Indian J Med Paediatr Oncol. 2013;34(1):238–241.
10. Abraham SW, Bassi KK, Giri AK, Pandey KK, Pattanayak M. Totally implant- able venous access ports: retrospective review of long-term complications in 81 patients. Indian J Cancer. 2012;49(5):114–118.
11. Aparna S, Ramesh S, Appaji L, et al. Complications of chemoport in children with cancer: experience of 54,100 catheter days from a tertiary cancer center of Southern India. South Asian J Cancer. 2015;4(2):143–145.
12. Kock HJ, Pietsch M, Krause U, Wilke H, Eigler FW. Implantable vascular access system: experience in 1500 patients with totally implanted central venous port systems. World J Surg. 1998;22(5):12–16.

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