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Original Research Article

Knowledge regarding PICC (peripherally inserted central catheter) line care among primary caregivers of PICC line patients undergoing chemotherapy

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ABSTRACT

PICC lines are widely used for cancer patients receiving chemotherapy. Regardless of various benefits, poor maintenance can cause thrombosis, infections and multiple complications. The role of caregiver is to protect and maintain the patency of central line with early identification of warning signals to prevent complications. A descriptive study was conducted on 55 primary caregivers of PICC line patients to assess the knowledge of primary care givers regarding PICC line care with a view to develop an informational booklet on PICC line care at home in selected areas of tertiary care hospital, Ludhiana, Punjab. A self-structured questionnaire was prepared which was categorized into 4 sub-categories (general knowledge, care of PICC line, complications of PICC line, flushing PICC line) to assess the knowledge regarding PICC line care among primary caregivers. Data was collected using self-report (paper and pen technique) and observation method. Results revealed that majority (56.47%) of primary caregivers were having average knowledge followed by (38.18%) were having good knowledge while (5.35%) had below average knowledge related to PICC line care. The knowledge was found to be more in the category of general knowledge with mean (5.86±1.43) followed by care of PICC line (4.36±0.88) and complications of PICC line (2.98±1.23) and the least knowledge was found in the category of flushing of PICC line with mean (2.25±1.23). Hence it can be concluded that majority of primary caregivers were having average knowledge regarding PICC line care, indicating the need to develop an informational booklet for caregivers to provide adequate PICC line care at home and prevent further complications.

1. Introduction

According to the cancer statistics in India 2018, it is being estimated that around 2.5 million of people living with cancer. Every year over 11,57,294 Lakhs new cancer patients had been registered and 7,84821 cancer related deaths had been reported. Cancers of oral cavity and lungs in males and cervical and breast cancer in females' accounts for over 50% of all cancer deaths in India. Cancer can be treated by surgery, chemotherapy, radiation therapy, hormonal therapy, targeted therapy and synthetic therapy.[1]

Chemotherapy as main treatment modality,a systemic therapy, need infusions for long time in multiple cycles. Subsequently emergence of long term stay for infusion like PICC line, ports, are becoming patients' mounting choice for chemotherapy. The Peripherally Inserted Central Catheter, commonly known by the acronym PICC, was first described in the literature by the German physician Forssmann in 1929. This catheter may be made of polyurethane or silicone, both biocompatible and less thrombogenic, which hinders the colonization of micro-organisms. It is generally used in medium and long term therapies, preferably inserted into the Basilic vein because of its largest diameter and the greatest blood flow of

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the peripheral arm veins and this vein also provides the straightest route to superior vena cava followed by the cephalic vein.[2]

According to IHI [Institute of health care improvement (2008)] approximately 90% of all central line associated blood stream infection occur due to central venous catheter use. These infections result in increased lengths of stay, increased cost and higher mortality rate. Cost attributed to central line associated blood stream infection range from $3,700 to $29,000 per episode and associated mortality rate range from 4% to 20%. It has been estimated that between 500 to 4000 patients die annually from blood stream infections related to central venous catheter used. This study recommended for continued patient education on venous access devices (VAD) care to minimize complications.[3]

A prospective cohort study was done on PICC line complications. These includes infection, thrombosis and mechanical complications (i.e. occlusion, accidental withdrawal) with global rates of 15.9%, 34% & 40.7% respectively. PICC related blood stream infections rates of 2.1 per 1000 catheter days. Because of these emerging complications there is huge need to care for the PICC line patients at home.[4]

A study was conducted by Pittet el al (1994) which suggests that these devices are not without serious risk. However, they require constant vigilance and scrupulous care to prevent life threatening complications. The major risk of these devices are infection, occlusion of catheter.[5]

Primary caregivers are the person who stays most of the time with patient. Obviously the role of caregiver is increased due to prolonged stay with the patient. He/she has to take care of the patient, provide necessary care for the prevention of complication, progression to diseases. To prevent from these complications, there is need for daily flushing, routine sterile dressing changes, restriction on physical activities such as contact sports and rough play for PICC line patients. So, the researchers felt the need to assess the knowledge of primary caregivers regarding PICC line care at home.[6]

2. Materials and Methods

Non – experimental descriptive research study was conducted to assess knowledge regarding PICC line care and its association with socio-demographic variables, among 55 primary caregivers of PICC line patients visited or admitted in tertiary care institute, Ludhiana, Punjab in May 2018. Participants were selected by using convenience sampling technique. Primary caregivers with age group of 18 – 70 years and able to read and understand Hindi, English or Punjabi language were invited to participate in the study. Participants not cooperative and unwilling at the time of data collection were excluded from the study. Institutional ethical approval was obtained with reference no. DMCH/R&D/2018/710.

The data collection tools were prepared by researcher after an extensive literature review, expert opinions and guidance. Tools consisted of following parts: Part (a) Patient profile (sociodemographic and clinical profile): It consisted of structured questionnaire for obtaining personal information like age, gender, marital status, religion, habitat, type of family, working status, education and family income and clinical profile of the patient includes medical diagnose, duration of illness, clinical stage of cancer, previous history of PICC line insertion, location of PICC line, duration of PICC line inserted, BMI of patient, type of treatment and chemotherapy regimen. Part (b) Sociodemographic profile of caregivers consisted of age, gender, marital status, religion, habitat, working status, education, relation with patients, stay with patient, family income and any previous knowledge regarding PICC line care.

Part (c) Knowledge Questionnaire, It consists of 24 multiple choice questions to assess the level of knowledge regarding PICC line care among primary caregivers of PICC line patients, under the following 4 sub-categories i.e. General knowledge (8 items), care of picc line (6 items), flushing of picc line (5 items) & complications of picc line (5 items). Maximum knowledge score was 24 & minimum knowledge score was 0. Each correct answer carries 1 score & each wrong answer carries 0 score. The scores were categorized as Good (17-24), Average (09-16) and below average (0-8).

Validity of research tool was determined by experts' opinion and suggestions on the relevance of items. Reliability of the tool was calculated by split half method which was found to be 0.96. Pilot study was conducted on 6 primary caregivers of PICC line patients to ensure the reliability of the tool and feasibility of study. The purpose of study was explained to the primary caregivers of PICC line patients and written informed consent was taken. Data was collected by self-report method (paper and pen technique) & observation. The time taken by each subject to complete the questionnaire was an average of 15- 20 minutes. Analysis and interpretation of data was based on objectives and was done by using descriptive (frequency distribution, mean, mean percentage, standard deviation) and inferential statistics ('t' test and ANOVA) at 0.05 level of significance.

3. Results

Socio-demographic profile of cancer patients with PICC line reveals that mean age of cancer patients were 26.31±17.95. Majority (65.5%) of cancer patients were males, unmarried (58.2%), non-working (72.7%). Less than half of the patients (43.6%) were having elementary education, followed by matric, higher secondary and graduate (27.3%), (14.5%) and (14.5%) respectively. Table 1 reveals the clinical profile of cancer patients. Nearly three fourth (80%) PICC line patients were diagnosed with cancer past one

year. Maximum patients (98.2%) were not having previous history of PICC line insertion. In majority of patients (61.8%), the PICC line was inserted in left upper arm followed by (38.2%) in right upper arm. Chemotherapy is the most recommended treatment (90.9%) followed by (09.1%) combined (radiation therapy, chemotherapy, surgical) treatment for cancer patients.

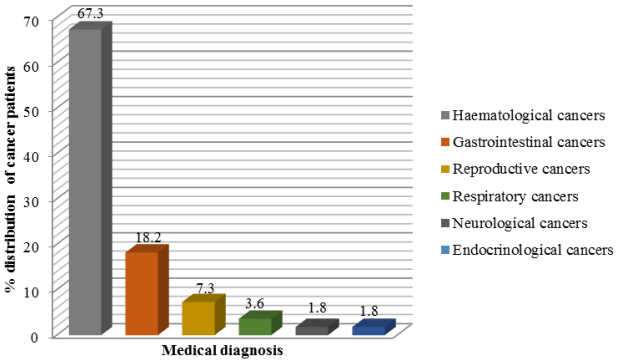

Fig. 1: Cancer patients as per their medical diagnosis

Figure 1 depicts the medical diagnosis of PICC line patients indicating more than half of the patients i.e. 37(67.3%) were diagnosed with hematological cancers, followed by 10(18.2%) patients were having gastrointestinal cancers and 4(7.3%) were having reproductive cancers. Very few patients with PICC line were having other cancers which include respiratory cancers 2 (3.6%), endocrinological cancers 1(1.8%) and 1(1.8%) patient was having neurological cancer.

Sociodemographic profile of primary caregivers of PICC line patients reveals that mean age of the primary caregivers was 37.76±12.87. Most of the caregivers of PICC line patients were males (50.9%), married (81.8%), belonging to Sikh religion (50.9%) & were residing in rural area (56.4%), having education up to graduation (40%). More than half of caregivers (60%) were non- working followed by (40%) were working. As per the relationship of care givers with the patients, (36.4%) were mothers and (14.5%) fathers of the patient and rest of the caregivers include husband, wife and other relatives. 83.6% primary caregivers were residing permanently with the patient. Most of the primary caregivers i.e. 50 (90.9%) were not having any previous knowledge regarding PICC line care.

Figure 2 demonstrates the level of knowledge regarding PICC line care among primary caregivers. More than half of the caregivers i.e. 31(56.47%) were having average knowledge followed by 21 (38.18%) caregivers with good knowledge and very few i.e. 3 (5.45%) were having below average knowledge regarding PICC line care.

It indicates the mean knowledge score of primary caregivers as per sub-categories of tool. The mean knowledge scores were highest in category of general

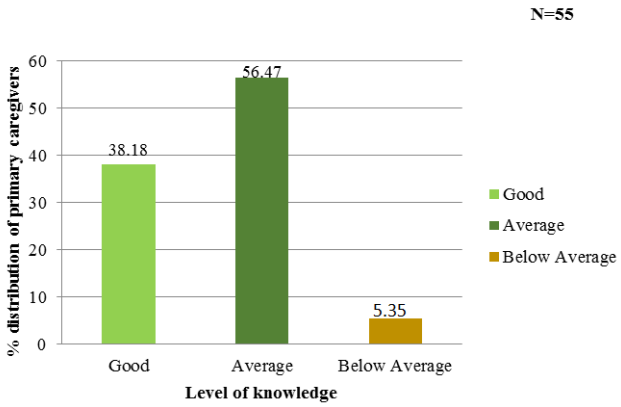

Fig. 2: Level of knowledge on PICC line care among primary caregivers.

knowledge (5.83 ± 1.43) followed by care of PICC line (4.36 ± 0.88) and complication of PICC line (2.98 ± 1.26). The least knowledge scores were regarding flushing of PICC line care.

Association of mean knowledge score was found to be statistically non-significant with socio-demographic variables except habitat which found to be statistically significant at t=6.399, p=0.014.

4. Discussion

The findings of the present study revealed that the knowledge of primary caregivers towards PICC line care was average followed by good knowledge scores. It is evident that primary caregivers understands and gained some knowledge about PICC line care while watching nurses practicing care in hopsitals. The results were found to be consistent with the findings of a study conducted by Chen J, Zhao H et al. (2018)[7] depicting mean knowledge scores 32.61±3.80, having average knowledge regarding PICC line care. Another study results also showed the effect of training or some educational materials regarding PICC line care and central catheter care in terms of enhancing knowledge scores among health care professionals Pushpakala K.J. and Ravinath A (2014)[8]

The present study reported that primary caregivers of PICC line patients obtained highest mean knowledge scores related to general knowledge about PICC line (5.83 ± 1.43) followed by care of PICC line (4.36±0.88). caregivers were having below average knowledge in flushing of PICC line (2.25±1.23). In congruent to this finding, Chen J, Zhao H et al. (2018)[7] study showed patients possessed certain degree of basic knowledge (32.61±3.80) and precaution but lacked knowledge regarding emergency treatment and prevention of complications.

Table 1: Distribution of patients as per their clinical profile N=55

Clinical variable	f	%
Duration of illness (in years)		
0-1	44	80.0
1-2	07	12.7
More than 2	04	07.3
Previous history of PICC Line insertion in family		
Yes	01	01.8
No	54	98.2
Location of PICC Line		
Right upper arm	21	38.2
Left upper arm	34	61.8
Duration of PICC insertion (in months)		
0-3	35	63.6
3-6	15	27.3
6-9	05	09.1
BMI of patient (in kg/m^2)		
<18.5	20	36.4
18.5 – 24.99	27	49.1
25 – 29.99	08	14.5
Type of treatment		
Chemotherapy	50	90.9
Combined	05	09.1
Chemotherapy regimen		
Doxorubicin,Vincristine,Cyclophosphamide	25	45.4
Paclitaxel,carboplantin,cisplatin	09	16.4
Methotrexete, Vincristine	05	09.2
Miscellaneous*	16	29.0

***** carfilzomib, cytrabine, daunorubicin, gemicitavin, folfirinox, imatinib

Table 2: Mean knowledge scores regarding PICC line care among primary caregivers N=55

Sub-Categories	Maximum score of each category	Mean ± SD	Mean %
General Knowledge	8	5.83±1.43	72.87
Care of PICC line	6	4.36±0.88	72.66
Complications of PICC line	5	2.98±1.26	59.60
Flushing PICC line	5	2.25±1.23	45.00

Maximum score = 24; Minimum score= 00

5. Conclusion

The study findings concluded that primary caregivers were having average knowledge regarding PICC line care. Study emphasizes that at home settings, caregivers need to be vigilant and take care of PICC line to maintain its patency and avoid inexpedient hospital visits. So, patients or primary caregivers should have sufficient knowledge for maintain line at home and early identifications of complications. Subsequently, the study emphasized the pivotal role of nurses to to teach the primary caregivers of PICC line patients to care for these central catheters at home. Novel approaches like videos on flushing PICC lines based on current standards of practice can be developed and informational booklet can be given to caregivers regarding PICC line care at home.

It can be recommended that similar study can be undertaken to on a large sample for making more valid generalizations. An experimental study can be conducted to assess the effectiveness of IEC booklet or video based education on level of knowledge & skills in providing PICC line care at home.

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8. Conflict of Interest

None.

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