Experience and Satisfaction of Cancer Patients With a Central Venous Catheter at a Tertiary Hospital in South Korea

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ABSTRACT

As cancer chemotherapy transitions from inpatient care to outpatient care, the number of patients who receive a central venous catheter (CVC) and the interest in CVCs as a safe intravenous administration route have increased recently in South Korea. The purpose of this study was to investigate the discomforts and satisfaction that cancer patients with a CVC may experience in daily activities as an outpatient and to provide rationale for nursing interventions. Data collection was conducted between April 11, 2011, and August 31, 2011. Forty-three questionnaires were collected, and a total of 41 questionnaires were used for the final analysis. The mean age of patients was 45.1 years (SD = 11.1 years; range, 18–64 years). The average score of experience of the CVC insertion procedure, daily life experiences of patients with a CVC, the satisfaction and fear of using a CVC, and the acceptance of CVCs were 2.48 ± 0.56, 2.18 ± 0.50, 2.56 ± 0.49, and 2.35 ± 0.39, respectively. The results showed that more detailed information on CVCs, as well as sufficient emotional support, should be provided to the patient to minimize discomfort during CVC insertion. Patient-centered education helps empower patients to master CVC self-management, as well as an understanding of the cultural aspect of South Korean patients who practice the traditional Confucian ethics of "unaltering one's body" and are therefore reluctant to have CVCs inserted into their bodies.

Key words: cancer, central venous catheter, patient experience, satisfaction

It is essential for patients with cancer to secure a safe intravenous (IV) route for their long-term therapy. Central venous catheter (CVC) insertion is required for the administration of chemotherapeutic agents, blood tests to check the progress of treatment, and provision of parenteral nutrition to treat malnutrition resulting from both the cancer and its treatment.[1] However, the pain caused by this invasive procedure and the fear of needles significantly impact the patient's sense of comfort.[2]

As chemotherapy administration transitions from inpatient care to outpatient care, the number of patients who receive a CVC and the interest in central vascular access as a safe administration route have increased globally[2] and in South Korea as well.[3] However, the insertion and maintenance of CVCs may cause adverse effects, such as infection, blood clot formation, occlusion, and dermatitis at the insertion site. The requirement for patients to maintain the central catheter, such as disinfecting the insertion site and flushing the catheter with heparin solution to maintain its patency, may increase patient anxiety and discomfort. Furthermore, a part of the CVC is exposed outside of the skin, which may negatively affect a patient's health and limit daily activities such as exercise and bathing. Health care personnel in Korea are often not sufficiently aware of the patient discomfort and adverse effects caused by CVC insertion. These catheters are considered indispensable to avoid frequent venipunctures and provide a safe and convenient IV route in cancer treatment.[4] As various types of CVCs are available, the catheter selected should be based on the type of IV medication administered and patient needs. However, because of the lack of understanding by the health care

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team and/or a lack of guidelines on CVC use, the proper application and management of CVCs are hindered.[4] Health care personnel may underestimate patient fear regarding the central catheter insertion, anticipatory anxiety, and distress.[5] A study by Nicholson et al[6] reported that patients who underwent CVC insertion did not experience any significant pain, and their anxiety related to the procedure lessened over time.[6] Therefore, there is a need to research the discomfort and anxiety of the patients with a CVC to be more attentive to concerns that many patients have experienced.

Patients in the United States tend to prefer outpatient treatment over hospitalization, because medical costs associated with hospitalization are high.[7] In contrast, patients with cancer in South Korea who are relatively less burdened by the treatment cost generally opt for inpatient treatment because they are anxious and fearful of not receiving proper care and are concerned about the side effects that may occur after the treatment.[8] However, many hospitals actually prefer outpatient treatment over inpatient treatment to increase hospital efficiency and hospital bed turnover rate and decrease the average length of stay.[3] Studies on various side effects of CVC insertion and their safety, efficiency, discomfort, and emotional reactions of the patients have been conducted in numerous other countries, as well as tools and guidelines to better understand the patient experience.[1,2,6,9] However, although a study for the current status of the patients with a CVC, predicted cause of catheter insertion, and side effects was conducted previously,[10-12] no study on the discomfort and anxiety of the patients with a CVC for an extended period of time has been conducted. This study investigated the discomforts that cancer patients with a CVC may experience in daily activities as an outpatient to provide rationale for nursing interventions.

METHODS

Design and Subjects

This study is a descriptive survey conducted with cancer patients who visited an outpatient care unit at the oncology department of a tertiary hospital in Seoul, South Korea. The patients had a CVC inserted for the first time and agreed to participate in the survey. Discomfort or satisfaction experienced by these patients during their daily activities was investigated and analyzed.

Measurement Tool

The study used a modified survey developed by Kreis et al[13] regarding patient satisfaction on CVC insertion. The original survey was modified to improve validity of the survey by a nursing professor and 2 oncology nurses. The survey consists of 26 questions in 4 categories, including 5 questions on the CVC insertion procedure, 7 questions on daily life experiences with a CVC, 8 questions on patient satisfaction and fear of the CVC dwell, and 6 questions on therapeutic efficacy. The survey contains questions on the interference of the CVC in patients' daily activities, work duties, housework, sports, and other hobby-related activities. A 5-point Likert scale was used for the responses, in which 5 = "strongly agree," 4 = "agree," 3 = "neutral," 2 = "disagree," and 1 = "strongly disagree." Some items were reverse-scored (where necessary). Higher scores indicate a more positive experience or satisfaction. In this study, the reliability of the scale was expressed as Cronbach α = .844. The patient health records were used to obtain the general characteristics of each subject, such as patient age, gender, type of cancer, length of hospital, and CVC dwell time.

Ethical Considerations and Data Collection

The study was approved by the institutional review board of the participating hospital (Form 2010-0752) to ensure the ethical protection of subjects before collecting data. The Korean Nurses Association *Declaration of Ethics*[14] states that nurses will maintain ethical judgments regarding the application of technology, including life sciences for medical treatment, which may impact human dignity, and never take part in unjust or unethical medical practices. The subjects were informed about the purpose and method of the research, the procedure to protect the confidentiality of the subjects, and their right to refuse to answer the questionnaire. The collection of patient data was initiated only after the participant's consent. The data collection was conducted from April 11, 2011, to August 31, 2011. Forty-three questionnaires were collected, and a total of 41 questionnaires were used for the final analysis, excluding those with incomplete responses.

Data Analysis

The collected data were analyzed using SPSS Windows 22.0 program (IBM, Armonk, NY). The general characteristics, experience, and satisfaction of the patients with CVCs were analyzed using descriptive statistical methods such as frequency, percentile, average, and standard deviation (SD).

RESULTS

General Characteristics of Participants

Twenty-one males (51.2%) and 20 females (48.8%) participated in this study. The average age of the study participants was 45.1 years. Thirteen patients were in their 40s (31.7%), making them the majority; 9 patients were in their 30s and 50s (22.0%) each. Six patients were in their 60s (14.6%), and 1 patient was under 20 years of age (2.4%). The duration of CVC dwell time was also collected. Twelve patients had the CVC dwell times for less than 60 days (29.3%), 9 for 61 to 90 days (22.0%), 8 for 91 to 120 days (19.5%), 8 for 121 to 150 days (19.5%), and 3 for more than 151 days (7.3%) (Table 1).

Experience of Participants With CVCs

Five questions were asked about the pain and fear regarding the CVC insertion. The average score of the question, "I'm afraid of having a side effect due to CVC insertion," was 2.08 $\pm$ 1.07. The question, "The CVC is very helpful in actively

TABLE 1

General Characteristics of Participants (N = 41)

Characteristics	Categories	N (%) or Mean ± SD
Gender	Female Male	20 (48.8) 21 (51.2)
Age, years	<30 30–39 40–49 50–59 ≥60	4 (9.7) 9 (22.0) 13 (31.7) 9 (22.0) 6 (14.6) 45.1 ± 11.1
Education	≤Elementary school Middle school High school ≥College	4 (9.7) 5 (12.2) 19 (46.3) 13 (31.7)
Religion	Christian Buddhist Catholic None	12 (29.3) 8 (19.5) 1 (2.4) 20 (48.7)
Diagnosis	Leukemia Lymphoma Multiple myeloma Myelodysplastic syndrome	28 (68.3) 8 (19.5) 4 (9.8) 1 (2.4)
Access site	Right Left	40 (97.6) 1 (2.4)
CVC dwell time, days	≤60 61–90 91–120 121–150 ≥151	12 (29.3) 9 (22.0) 8 (19.5) 8 (19.5) 3 (7.3) 92.27 ± 40.86

Abbreviations: CVC, central venous catheter; SD, standard deviation.

treating the disease," scored 4.22 ± 0.52, while the question, "I experience pain when the CVC is inserted," had the average score of 3.26 ± 1.20. The question "I have ongoing pain because of the CVC inserted," scored 1.95 ± 0.80, and the question "I feel the area where the CVC was inserted uncomfortable," had the average score of 2.61 ± 0.89 (Table 2).

Daily Life Experiences

A total of 7 questions were asked to evaluate patients' daily life experiences with CVC dwell, and the average for the question, "I can enjoy my leisure time with the CVC," was 2.87 ± 1.00. The average for the question, "The CVC obstructs my daily activities," was 2.75 ± 1.04, and the average score for the question, "I hesitate taking a bath or a shower due to the CVC," was 3.14 ± 0.91. For the question "I feel that I am hindered in arm movement by the CVC," the average score was 2.51 ± 0.86, and the average score for the question, "I hesitate engaging in social activities by the CVC," was 2.82 ± 0.80. The question, "I don't feel that I am disabled at work by the CVC," was 2.92 ± 0.90, and the question, "I don't feel that I am hindered in sports by the CVC," was 2.24 ± 0.91 (Table 3).

TABLE 2

Experience of Participants With CVCs (N = 41)

Questions	Minimum	Maximum	Mean ± SD
I am afraid of having a side effect due to CVC insertion.[a]	1	5	2.08 ± 1.07
The CVC is very helpful in actively treating the disease.	2	5	4.22 ± 0.52
I experienced pain when the CVC is inserted.[a]	1	5	3.26 ± 1.20
I have ongoing pain because of the CVC inserted.[a]	1	5	1.95 ± 0.80
I feel the area where the CVC was inserted uncomfortable.[a]	1	5	2.61 ± 0.89
Total			2.48 ± 0.56

Abbreviations: CVC, central venous catheter; SD, standard deviation.
[a]Reversed item.

The Satisfaction and Fear of CVC Dwell

A total of 8 questions were asked about patient satisfaction and fear of CVC dwell. The average score of the question, "I am overall satisfied with my CVC," was 4.22 ± 0.82; the average score for the question, "I would recommend a CVC to other patients," was 4.17 ± 0.77; the score for the question that asked, "I would choose the CVC again in a similar situation," averaged 4.31 ± 0.72; the score for the question, "I would like to remove the CVC as soon as possible," averaged 3.26 ± 1.70; the score for the question, "I don't mind maintaining the CVC," averaged 3.14 ± 0.10; the score for the question, "I am afraid of complications with the CVC," averaged 3.68 ± 0.81; the score for the question, "I am always thinking of my CVC," averaged 2.43 ± 0.95. Lastly, the average score for the question, "I am afraid of the CVC being blocked," was 2.92 ± 1.17 (Table 4).

Acceptance of CVCs

A total of 6 questions asked about patient acceptance of the CVC. The average score of the question, "I regret having inserted the CVC," was 1.70 ± 0.64; the average score of the question, "I have been sufficiently informed about the CVC procedure," was 3.31 ± 0.81; the average score of the question, "I am satisfied with skin change at CVC site," was 3.02 ± 0.85. On the other hand, the average score of the question, "Flushing is bothersome," was 2.26 ± 0.77; the average score of the question, "I am satisfied with the information about the CVC," and ,"There are sufficient medical supports to manage the CVC outside the hospital," were 3.82 ± 0.62 and 3.68 ± 0.75, respectively (Table 5).

TABLE 3

Daily Life Experiences (N = 41)

Questions	Minimum	Maximum	Mean ± SD
I can enjoy my leisure time with the CVC.[a]	1	5	2.87 ± 1.00
The CVC obstructs my daily activities.[a]	1	5	2.75 ± 1.04
I hesitate taking a bath or a shower due to the CVC.[a]	1	4	3.14 ± 0.91
I feel that I am hindered in arm movement by the CVC.[a]	1	4	2.51 ± 0.86
I hesitate engaging in social activities by the CVC.[a]	1	4	2.82 ± 0.80
I don't feel that I am disabled at work by the CVC.	1	5	2.92 ± 0.90
I don't feel that I am hindered in sports by the CVC.	1	4	2.24 ± 0.91
Total			2.18 ± 0.50

Abbreviations: CVC, central venous catheter; SD, standard deviation.
[a]Reversed item.

TABLE 4

The Satisfaction and Fear of CVC Dwell (N = 41)

Questions	Minimum	Maximum	Mean ± SD
I am overall satisfied with my CVC.	1	5	4.22 ± 0.82
I would recommend CVC to another patient.	1	5	4.17 ± 0.77
I would choose the CVC again in a similar situation.	1	5	4.31 ± 0.72
I would like to remove the CVC as soon as possible.[a]	1	5	3.26 ± 1.20
I don't mind maintaining the CVC.	1	5	3.14 ± 1.10
I am afraid of complications with the CVC.[a]	1	5	3.68 ± 0.81
I am always thinking of my CVC.[a]	1	4	2.43 ± 0.95
I am afraid of the CVC being blocked.[a]	1	5	2.92 ± 1.17
Total			2.56 ± 0.49

Abbreviations: CVC, central venous catheter; SD, standard deviation.
[a]Reversed item.

TABLE 5

Acceptance of CVCs (N = 41)

Questions	Minimum	Maximum	Mean ± SD
I regret having inserted the CVC.[a]	1	4	1.70 ± 0.64
I have been sufficiently informed about the CVC procedure.	2	5	3.31 ± 0.81
I am satisfied with skin change at CVC site.	2	5	3.02 ± 0.85
Flushing is bothersome.[a]	1	5	2.26 ± 0.77
I am satisfied with the information about the CVC.	2	5	3.82 ± 0.62
There are sufficient medical supports to manage the CVC outside the hospital.	2	5	3.68 ± 0.75
Total			2.35 ± 0.39

Abbreviations: CVC, central venous catheter; SD, standard deviation.
[a]Reversed item.

DISCUSSION

The result of the survey on the experiences of CVC procedures indicated the following from highest to lowest: usefulness of a CVC was the highest, followed by experience in painful CVC procedure and fear of complication. The score for ongoing pain was the lowest. A majority of the 41 participants of the study think the CVC is helpful in administering treatment. Study participants responded positively to the question, "A CVC is very helpful in actively treating the disease." This response is consistent with results by Yamada et al,[15] who studied the usefulness of CVCs in patients with terminal cancer in Japan. However, it should be noted that some patients felt discomfort at the insertion site and had a fear of complications. This result agrees with the finding by Yi et al[16] in which 60% of the patients responded that they experience discomfort because of the CVC, which suggests that it is necessary to consider the discomfort that can be experienced after CVC insertion. Also, considering the study that reported that patients may be more sensitive to the discomfort due to the anxiety concerning CVC insertion, it is emphasized for health care professionals to anticipate the level of patient anxiety associated with CVC insertion and provide adequate emotional support and appropriate direction to maintain the CVC in daily life to decrease patient anxiety and discomfort. Thus, it is essential to accurately assess the patient's anxiety of CVC insertion and prescribe a management process to actively alleviate the patient's discomfort.

Regarding daily life after CVC insertion, most patients hesitated to take a bath and felt hindered to perform daily

tasks and participate in social events. Although <20% of the patients indicated discomfort in daily life and leisure activities in the study by Nagel et al,[17] the result of this study showed that discomfort interferes with patient daily and social lives. The CVC itself can be a burden in daily life for patients. Although insertion is performed for patient safety and comfort, it should be considered in the provision of nursing interventions that a patient may experience discomfort in daily life because of the CVC.

The overall satisfaction with the CVC showed the highest score, and recommendation to another patient and same decision in a similar situation also showed the average score of 4 or above out of 5. CVC use for cancer treatment has increased recently in South Korea[3] because it decreases pain and bleeding caused by frequent venipunctures. Many South Koreans practice traditional Confucian ethics of "unaltering one's body" and are therefore reluctant to have a CVC inserted.

Additionally, some patients who must self-administer heparin have a fear of the catheter itself because the tip is placed in the chest area near the heart.[13] Patient education for placing a CVC included a presentation to assist the patient in selecting a type of catheter to be used for treatment and explanation of the procedure, pain, and discomfort with the procedure, as well as complications with the catheter placement.[9,13] It is most important that patients should be provided with emotional support to minimize fear and anxiety.

The results of this study show that patients generally indicated positive experiences in terms of the acceptance of CVCs. The health care team is required to minimize patient fear regarding CVC insertion, as well as anticipatory anxiety or distress that patients may experience before the procedure. Therefore, the health care team should provide patient-centered education to manage the patient's CVC experience, including patient discomfort. Fear of complications and desire for removal of the CVC scored above 3 of 5. This suggests that, for outpatients with a CVC, the health care team must evaluate the patient's anxiety, as well as being considerate of the patient's condition, and show the necessity of accurately informing the patient the purpose of CVC insertion, length of CVC treatment, and the timing of removal.

Acceptance of the participants' CVC scored more than 3 of 5 on items about sufficient information related to the CVC procedure, satisfaction with explanation, and sufficient medical support outside the hospital. The question about regretting the CVC insertion showed the lowest score, which implies a positive response. Such positive responses may be a result of using recommendations from multifaceted studies on minimizing patient discomfort in CVC insertion,[15,16] thus being able to provide a systematized and sufficient explanation, management, and education about the CVC to the patient before the CVC procedures. However, even if there is evidence that sufficient information and patient participation would positively influence the postinsertion satisfaction, as well as decreasing side effects and emergency department visits, the roles of patients and family members in choosing a CVC are limited in our clinical setting. Therefore, it is necessary to provide sufficient information on the characteristics of each type of CVC, as well as a process to discuss the patient's lifestyle and personal characteristics to choose the most efficient and most suitable CVC.[16] To increase patient satisfaction and acceptance of CVC use, providing educational programs to improve competency of CVC insertion for the health care team is needed.

CONCLUSION

The study findings have illustrated that more detailed information on CVC insertion, duration of dwell time, and ongoing management may help to minimize the patient's discomfort regarding the use of a CVC for cancer treatment. Additionally, the health care team must provide adequate emotional support to the patient throughout the CVC insertion and process of use. The findings also have become the basis of suggesting the necessity of sufficient discussion between the patient and health care professional to enable the patient to choose a suitable CVC. Nurses in oncology departments have an important role in managing their patient's CVC care and educating patients on how to manage their CVC. Nurses could use the findings in everyday practice, such as patient education regarding bathing, site care, and reporting concerns. This study was limited in that it included only cancer patients at a single care facility in South Korea. Further research is recommended to understand the concerns of patients in South Korea related to CVC use and care and management as a safe and effective method for IV administration.

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