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Original Article

Incidence of Early Related–Complications of Port-A Catheter and Impact of Clinical Pharmacist Participation and Counselling Outcomes

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ABSTRACT

Background: Port-A catheter is an implanted device used for frequent chemotherapy administration. It is not complications free and often requires an additional intervention for the assessment of possible complications and provision of further patient care**.** The first objective is to assess the incidence of early-related complications (ERCs) of port-A catheter insertion. The second objective is to evaluate the effectiveness of appropriate counselling and patient care services offered by the clinical pharmacist on reducing the incidence of the observed complications. **Materials and Method:** A prospective pilot study was carried out on newly diagnosed cancer patients eligible for chemotherapy administration via port-A catheter. Suitable counselling and patient care services were provided and the incidence of ERCs of port –A catheter were recorded and considered as the first reading. After one month of follow-up, reduced incidence of ERCs of port –A catheter, patients' acceptance and application of recommendations were recorded and considered as the second reading. **Results:** 63.6% (N=70) of the study participants suffered from ERCs of port –A catheter. The provision of counselling services by the clinical pharmacist included therapeutic and non-therapeutic recommendations which resulted in limited incidence of ERCs particularly skin rash (87.1%; P=0.0001) that was significantly reduced (41.4%; P=0.031) at the end of the study. **Conclusion:** The essential role of the clinical pharmacist within the multidisciplinary team could further augment patient care and reduce the incidence of ERCs of port –A catheter via the provision of appropriate counselling services that could optimize therapy outcomes and patient satisfaction.

Key words: Cancer, Chemotherapy, Clinical pharmacist care, Early-Related Complications, Port-A Catheter.

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INTRODUCTION

Port-A catheter is the most common and preferable application device to be used because of ease of access, lower occurrence of complication rates, and significantly improved quality of life.[1-2] However, it is not free from complications. Port-A catheter complications can be categorized into early- and late-related complications. Early-related complications usually detected between 24 h and 4 weeks after implantation; however, late complications can be observed after 4 weeks of implantation.[3]

Port-A catheter complications could also be followed up by the clinical pharmacist who might help in the assessment of the complications and provide further counselling and patient care services in collaboration with other healthcare professionals. Patient counselling by the clinical pharmacist is an essential part in the management of therapy-related problems as it involves provision of proper education to the patients regarding adverse effects, nutritional counselling and optimal lifestyle modification. It is principally aimed to minimize unnecessary hospital admissions, reducing and preventing therapy-related problems, achieving the desired therapeutic goals, and improving therapy outcomes.[4-5]

The objective of this study was to assess the incidence of early related -complications (ERCs) of port –A catheter insertion, and to evaluate the effective role of clinical pharmacist via the provision of appropriate counselling and patient care services on reducing those complications in cancer patients undergoing chemotherapy through port-A catheter application.

MATERIALS AND METHODS

A prospective pilot study, single centre analysis conducted from February through May 2015. Approval of the study protocol was granted from the Ethical Committee of Dr. Lütfi Kırdar Kartal Teaching and Research Hospital at the Anatolian side of Istanbul –Turkey.

Patient recruitment

The study was carried out on patients newly diagnosed with different types of cancers. Cancer patients attending for chemotherapy administration at the oncology centre of Dr. Lütfi Kırdar Kartal Teaching and Research Hospital were eligible for recruitment after meeting the inclusion criteria of the study. Several patients undergoing port-A catheter implementation and eligible for the inclusion criteria during the above period were used to estimate the sample size. Inclusion criteria included patients over the age of 18 years, patients with newly diagnosed cancer eligible for chemotherapy and have an indication for port A- catheter implantation. Patients who expressed willingness to take part in the study were provided with additional written information and were asked to sign the study consent form. Exclusion criteria included patients with pre-existing port A- catheter insertion and patients with skin disorders.

Baseline data were collected from the medical records of the patients. The collected data were used to structure a detailed health report for the patients including socio-demographic and medical history data (age, gender, cancer family history, cigarette smoking, presence or absence of comorbid conditions, carcinoma type, and previous chemo-radiotherapy).

Study outcomes

In an independent office located next to the nurse's clinic, each patient subjected for port-A catheter insertion at the date of initiating scheduled chemotherapy administration received appropriate counselling and patient care services by the clinical pharmacist. Furthermore, patients were followed up for 3 to 5 days after the demonstration of appropriate counselling recommendations to measure outcomes. They are also instructed to feed back the clinical pharmacist via face to face interview whenever ERCs of port –A catheter were observed. ERCs of port –A catheter were recorded and considered as the 1st reading. Suitable counselling and patient care services were further created for those patients suffering from ERCs of port –A catheter, how to overcome and manage the complications properly in collaboration with other healthcare professionals. After one month of follow-up, reduced incidence of ERCs of port –A catheter alongside patients' acceptance and application of the demonstrated recommendations were also recorded by the clinical pharmacist and considered as the 2nd reading.

Statistical analysis

The SPSS 16.0 package was used for statistical analysis and to present the effect of different factors on the study parameters. Chi-square test was used to significantly compare percentages in the study. Wilcoxon test was performed on differences between the 1st and 2nd readings at the end of the study. The level of significance used for the statistical analysis was $P < 0.05$.

RESULTS

Of the recruited patients who met the study's inclusion criteria, 110 patients were identified. Mean age of the patients was 60.44±7.78 years. Most patients were males (77, 70%). 17 (15.5%) had diabetes mellitus which constitutes the most common co-morbid condition observed among the study participants. Colorectal carcinoma was the most common (76, 69.1%), followed by stomach carcinoma (29, 26.4%). Out of the total number of study participants, 70 (63.6%) patients suffered from ERCs of port –A catheter (Table 1).

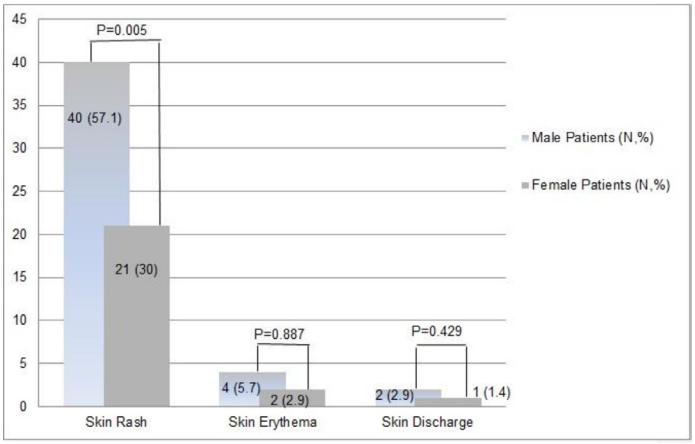
Throughout the application of port-A catheter, skin-related complications were the most common ERCs of port –A catheter insertion and manifested as skin rash, skin erythema and skin discharge. Of these, skin rash was the most significant complication observed (P=0.005) with an incidence of 57.1% (40) and 30% (21) among male and female patients respectively. However, there was a non-significant incidence among male and female patients regarding skin erythema [5.7% (4) vs. 2.9 (2), (P=0.887)] and skin discharge [2.9% (2) vs. 1.4% (1), (P=0.429)] as shown in Figure 1.

The average time for determining the ERCs of port –A catheter, making different recommendations and measuring outcomes for each patient was approximately 20–30 min. Regarding patient education status, all patients (70,100%) who suffered ERCs of port –A catheter had counselling and education services by the clinical pharmacist (pharmacist-based education) compared to those who had nurse-based education (56, 80%) and physician-based education (43, 61.4%) as shown in Figure 2.

During this study, a total of 155 recommendations were given by the clinical pharmacist and represented as non-therapeutic recommendations (95, 61.3%) and therapeutic recommendations (60, 38.7%). The non-therapeutic recommendations included lifestyle modifications (45, 47.4%) and diet advice (50, 52.6%). All the therapeutic recommendations were accepted by the physicians and prescribed after patients' referral. According to the clinical pharmacist counselling services, 97% (150) out of the total recommendations were followed by the patients as shown in Figure 3.

Table 1: Baseline demographic and clinical characteristics of study population.

Variables	No. of Patients (%)
Mean Age (year)±SD	60.44±7.78 years
Gender	
Male	77 (70)
Female	33 (30)
Cancer Family History	
Yes	30 (27.3)
No	80 (72.7)
Cigarette Smoking	
Yes	0
No	110 (100)
Comorbid condition	
Yes	17 (15.5)
No	93 (84.5)
CA Type	
Colorectal CA	76 (69.1)
Stomach CA	29 (26.4)
Others	5 (4.5)
Previous Chemo-radiotherapy	
Yes	0
No	110 (100)
ERCs of Port-A catheter	
Yes	70 (63.6)
No	40 (36.4)



** ($P<0.01$)

Figure 1: Incidence of ERCs of port –A catheter among study population.

During this study as a sum, 87.1% (61) of the patients suffered from skin rash, 8.6% (6) suffered from skin erythema and 4.3% (3) suffered from skin discharge. With the continued provision of counselling services and follow-up by the clinical pharmacist, 41.4% (29) of the patients showed a significant reduction in the incidence of skin rash at the end of the study (P=0.031). However, there was a non-significant reduction in the incidence of skin erythema [8.6% (6) vs.5.7% (4), (P=0.873)] and skin discharge [4.3% (3) vs. 1.4% (1), (P=0.694)] which might be attributed to the small sample size (Figure 4).

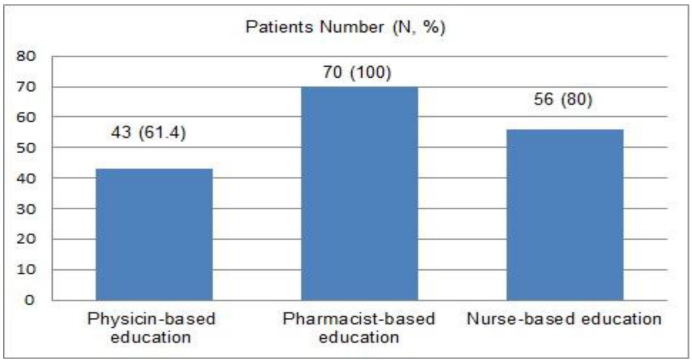


Figure 2: Patient education status for the ERCs of port –A catheter.

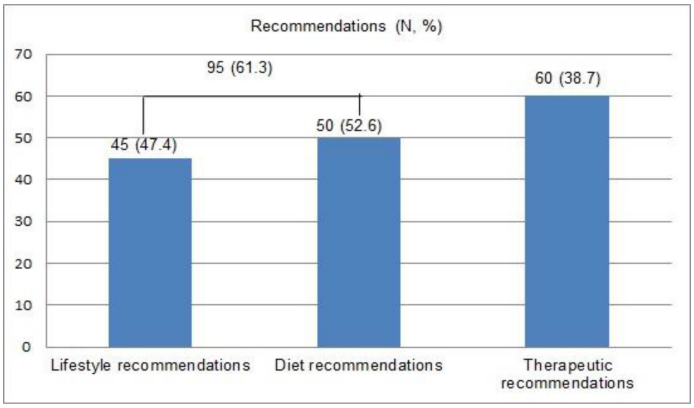
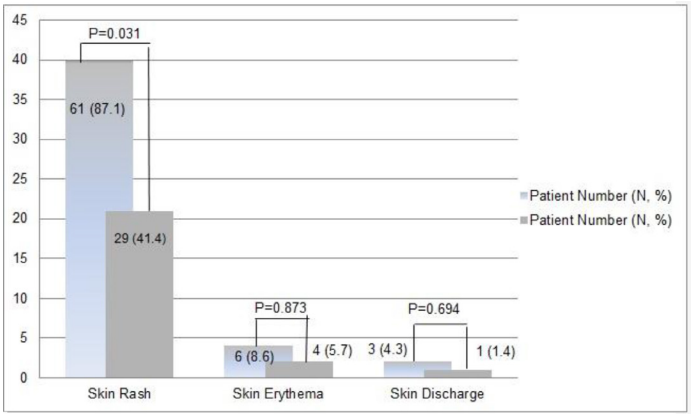


Figure 3: Types of clinical pharmacist counselling services.



** (P<0.01)

Figure 4: Incidence of ERCs of port –A catheter before and after Clinical pharmacist intervention.

DISCUSSION

In oncology settings, port-A catheters are usually implanted on the aim of achieving proper and periodic administration of chemotherapy for the treatment of different malignant tumours where the placement of these devices allows the patients to continue their normal activities without restrict and special care. Despite this, the advantages of port-A catheter use outweigh the disadvantages and the related complications should be taken in consideration.[6-8]

Findings of this study showed that local skin-related complications were the most common ERCs of port –A catheter. Indeed, local skin adverse reactions could result in poor patients' compliance, interruptions or cessation of therapy and significantly reduce the patients' satisfaction and quality of life.[9,10] Among all the observed skin-related complications, skin rash was the most notable and significant one (P=0.005). Other manifested skin–related complications were skin erythema and discharge. In other literatures, a study by Miroslav Granic *et al.*[11] showed that malposition and disconnection were the early complications of port-A catheter implantation. Another study by Takatoshi Nakamura [12] reported that early complications of port –A catheter were infection, catheter kinking, and port leakage.

Additionally, 63.6% of the study participants were suffering from the incidence of ERCs of port –A catheter. These findings support the evidence that implantation of port-A catheter into the body is accompanied by the risk of developing different complications. According to this, provision of appropriate counselling and patient care services through the collaboration of another healthcare member is highly important. The clinical pharmacist as being part of the multidisciplinary healthcare team and being closer to the patients in a productive and efficient way is a pivotal part in solving several therapy-related problems, improving treatment outcomes and reducing readmission rates.[13]

Findings of this study also revealed the diversity in patient education patterns and recommendations regarding port –A catheter complications which were demonstrated by different healthcare professionals. In other meanings, the extent that patients could be in frequent and regular contact with the healthcare professionals for further provision of health care, overcoming and managing therapy-related complications. This was observed as a pharmacist-based education (100%), nurse-based education (80%) and physician-based education (61.4%) as presented in Figure 2.

The essential role of the clinical pharmacist on the incidence of ERCs of port –A catheter was evidenced as skin rash, the most common skin problem observed. Additionally, the incidence of other skin-related complications was also limited to few cases of skin erythema (6, 8.6%) and skin discharge (3, 4.3%) as shown in Figure 1.

Furthermore, with the provision of therapeutic and non- therapeutic recommendations and other clinical pharmacist-based education for those patients who complained from ERCs of port –A catheter and with the continued follow up in collaboration with other multidisciplinary healthcare team resulted in a significant reduction in the incidence of skin rash at the end of the study (87.1% vs. 41.4%, P=0.031). Though there were insignificant results, a reduced incidence was observed for both skin erythema [8.6% (6) vs.5.7% (4), (P=0.873)] and skin discharge [4.3% (3) vs. 1.4% (1), (P=0.694)].

In this study, all the therapeutic recommendations were accepted by the physicians and prescribed after patients' referral with 97% (150) out of the total recommendations were followed by the patients as shown in Figure 3. These findings were similar to earlier studies which showed that pharmacist recommendations have reported positive clinical outcomes with acceptance rates reaching over 90%.[14] Moreover, in a study by Leape LL *et al.*[15] showed that physicians accepted 99% of the pharmacist' recommendations with 66% reduction in therapy-related complications when the pharmacist was involved in a collaboration with the healthcare team.

The clinical pharmacist is in a unique position to safeguard the patient from the occurrence of many therapy-related problems and the participation can greatly help to overcome several complications by appropriate counselling, involving in monitoring and reporting of therapy-related complications due to ease of access to the patients.[16-17] Therefore, it could be taken in consideration that the early provision of suitable counselling services by the clinical pharmacist might lead to lower incidence of other complications of port-A catheter insertion such as severe skin infections and necrosis.

Generally, the clinical pharmacists have a low level of involvement in counselling and health promotion services for cancer patients undergoing port-A catheter application. To the best of our knowledge, this is the first study in Istanbul-Turkey as a new approach to determine the incidence of ERCs of port –A catheter alongside the impact of counselling and patient care services offered by the clinical pharmacist in a real-life setting on the outcomes of these complications. This study could be a base for further prospective studies to determine the impact of early implementation of clinical pharmacy services on late-related complications of port-A catheter insertion. However, the study has some limitations that could be considered. It was conducted with a small number of participants as the recruitment included only patients meeting the eligible criteria at a single centre with specific type of cancers.

CONCLUSION

Throughout port-A catheter application, early-related complications require comprehensive assessment by all multidisciplinary healthcare team including the clinical pharmacist. During the conducted study, the provision of continuous education, counselling and patient care services need to be recommended, distributed and implemented by the clinical pharmacist at the oncology unit and that could further improve therapy outcomes of port –A catheter and patients satisfactions.

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ABBREVIATIONS

CA: Carcinoma; **ERCs:** Early-Related Complications.

CONFLICT OF INTEREST

Authors declare no conflicts of interest.

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