

Chemotherapy Extravasation at Hospital Pulau Pinang, Malaysia

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SUMMARY

Purpose: Extravasation with intravenous chemotherapy is a common complication of chemotherapy which carries the risk of devastating complications. This study aims to determine the rate of extravasation with intravenous chemotherapy in a major hospital where chemotherapy is delivered in various departments other than the oncology department.

Patients and Methods: All patients who underwent intravenous chemotherapy in the oncology department and surgical wards in Penang General Hospital from 1st February 2008 till 31st June 2008 were recruited retrospectively for this study to look at the rate of extravasation.

Results: A total of 602 patients underwent intravenous chemotherapy during this period. Fifty patients received chemotherapy in the general surgical ward while another 552 patients received chemotherapy in the oncology department. There were 5 cases of extravasation giving an overall extravasation rate of 0.8% (5/602). However, 4 of these cases occurred in the general surgical ward giving it a rate of 8% (4/50).

Conclusion: The rate of extravasation in our hospital was 0.8%. However, this rate can be significantly increased if it is not done under a specialized unit delivering intravenous chemotherapy on a regular basis. Preventive steps including a standard chemotherapy delivery protocol, staff and patient education must be put in place in all units delivering intravenous chemotherapy.

KEY WORDS: Chemotherapy, extravasation, vesicant, cancer

INTRODUCTION

Intravenous administration of chemotherapy for cancer treatment forms a major volume of work done in an oncological department. There is an attendant risk of extravasation regardless of measures put in place to prevent its occurrence, thus informed consent prior to the administration of chemotherapy must always include the risk of extravasation. The reported rates in the literature vary from 0.1% to 6%¹⁻⁵. However, there has been no reported extravasation rate for chemotherapy in this country in the literature. This could be due to its under-recognition and under-appreciation of this debilitating complication. It is not possible to adequately obtain an informed consent from the patients without an appreciation of the local rate of chemotherapy extravasation. The major concern with extravasation is with the vesicant

chemotherapy agents which can lead to surrounding tissue damage and necrosis often needing surgical debridement and subsequent plastic reconstructive surgery. Chemotherapy with strong vesicant potential commonly used on our center includes anthracyclines (epirubicin) and vinca alkaloids (vincristine, vinorelbine). Those with low vesicant potential include platinum (cisplatin, oxaliplatin), taxanes (docetaxel, paclitaxel) and 5-fluorouracil⁶⁻⁸.

Lack of knowledge on extravasation on the part of healthcare providers and patients can contribute to even higher rates of chemotherapeutic extravasations. This is an area that needs to be examined in each oncology center so that remedial actions can be taken if necessary to reduce its occurrence. This study aims to determine the rate of chemotherapeutic extravasation in our center.

MATERIALS AND METHODS

This study was conducted at Penang General Hospital. Data for incidence of chemotherapeutic extravasation was collected retrospectively for all patients who underwent intravenous chemotherapy in the oncology department and the general surgical department from 1st February 2008 till 31st May 2008. All patients who underwent intravenous chemotherapy in these departments were included in this study regardless of type of cancer, stage of cancer, purpose of chemotherapy, age of patient, presence of co-morbidity or patient's performance status.

RESULTS

A total of 602 patients underwent intravenous chemotherapy during this period from 1st February 2008 till 31st May 2008. Fifty patients received chemotherapy in the general surgical ward while another 552 patients received chemotherapy in the oncology department. Of the 552 patients who received chemotherapy in the oncology department during this period, 392 patients received it in the ward while 160 patients received it in the oncology daycare center. There were 5 cases of extravasation giving an overall extravasation rate of 0.8% (5/602). However, 4 of these cases occurred in the general surgical ward giving it an alarmingly high rate of 8% (4/50). The 4 cases of extravasation in the general surgical ward involved the FEC regimen (5 Fluorouracil, Epirubicin, Cyclophosphamide) while another case of extravasation which occurred in the oncology ward involved the DeGramont's regimen (5 Fluorouracil, Folinic acid). All 5 cases of the extravasation occurred over the dorsum of the hand.

DISCUSSION

The overall chemotherapeutic extravasation rate of 0.8% is in line with the published rates in the literature. However, what is more disconcerting is the very high rate of 8% which occurred in the general surgical department. All the cases of extravasation involved a vesicant. The field of oncology is a very specialized field including the delivery of chemotherapeutic agents. In an ideal situation it should be done only in specialized centers by trained personnel specializing in oncology. However, due to the shortage of staff trained in oncology the delivery of chemotherapy is often done in surgical departments. We must be cognizant to this fact and take remedial actions to keep the extravasation rate as low as possible. There are many guidelines available for the management of extravasations but the key to minimize extravasation is prevention^{5, 9-14}. Education both for staff and patients is essential.

All departments giving chemotherapy must be cognizant to the very real risk of extravasation especially with vesicant chemotherapeutic agents. Written guidelines for handling cytotoxic agents and procedures to avoid extravasation should be made easily available. Personnel responsible for administering chemotherapy must be informed and educated about the drugs and problems they may cause in case of extravasation. Training programs must be held regularly especially when there is a high turnover of staff as in the case of house officers in the general surgical department. This problem is compounded by the fact that the general surgical departments do not administer chemotherapy on a regular basis and as such experience and expertise in the delivery of chemotherapy can be lacking unless a robust training program is put in place. Patient awareness on extravasation cannot be underestimated in the prevention of this complication. Pain or burning sensation is usually the first sign that should be reported by the patient as soon as it occurs so that the chemotherapy infusion can be halted at once. There will certainly be a delay in informing the staff if the patients are unaware of this complication. Any efforts in education on extravasation must be two pronged targeting both the staff delivering chemotherapy and the patients receiving the treatment.

As a result of this study, strategies were put in place to improve the knowledge of the staff involved in chemotherapy delivery and improve the awareness of patients undergoing chemotherapy in this institution. This included a one hour weekly orientation at the oncology chemotherapy daycare center regarding chemotherapy administration and risk of extravasation for all new house officers in the general surgical department reporting for duty or prior to being in charge of patients on chemotherapy in the general surgical ward. The surgical wards involved in the delivery of chemotherapy also assigned two staff nurses per ward to be in charge of chemotherapy and a standard chemotherapy delivery protocol were provided for each patient undergoing chemotherapy for which all staff must follow. In addition, patient education on extravasation for all patients undergoing chemotherapy on extravasation was aided by extravasation instruction leaflets in different languages according to patients' preference. Subsequently, further data was collected from 1st of June 2008 to 31st of December 2008 for the occurrence of extravasation in the same wards and oncology daycare center. There were 98 patients in the surgical wards, 969 patients in the oncology wards and 471 patients in the oncology daycare center who underwent intravenous chemotherapy during this period and no occurrence of extravasation was recorded.

We acknowledge all the shortcomings associated with a retrospective study especially the small number of patients recruited in the surgical department which administered intravenous chemotherapy. However, despite the small numbers we demonstrated clearly the risk of extravasation when intravenous chemotherapy is given in these departments where patients undergoing this procedure are few and far in between. This is a reality in developing countries where there are insufficient specialized oncological services to cater for the entire population. Taking into account the cost of travelling to a major center and the overwhelming burden of care in these centers it is inevitable that some patients will need to receive chemotherapy at a peripheral hospital in the respective surgical departments. As such, recognition of this problem is a start and subsequent preventive measures must be put in place.

In conclusion, the rate of extravasation in our hospital is 0.8%. However, this rate can be significantly increased if it is not done under a specialized unit delivering intravenous chemotherapy on a regular basis. Preventive steps including a standard chemotherapy delivery protocol, staff and patient education must be put in place in all units delivering intravenous chemotherapy.

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