PREVALENCE PATTERN OF CANCER AND HANDLING OF CYTOTOXIC DRUGS

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ABSTRACT

A retrospective study conducted in the two hospitals namely Bhaktapur Cancer Care Center and Om Hospital and Research Center. The study dealt with the prevalence pattern, management of cancer and investigations of the handling of cytotoxic drugs. A total of 358 (179 from each hospital) cancer cases were. Questionnaires were used to investigate the handling of the cytotoxic drugs in the hospitals. It was found that age group of 45-65 are more prone to cancer. The top five malignancies were found to be stomach, ovarian, Non Hodgkin's Lymphoma (NHL), lungs and breast cancer. Female gender were more prone to cancer than males with the involvement of the female reproductive system and breast causing their greater prevalent cases. The management of the cytotoxic drugs was assessed by studying the medical records of the in-patients, receiving chemotherapy. The drug therapy prescribed for all the cases of cancer in both the hospitals was found to be rational. The handling of cytotoxic drugs was investigated by direct observation of the reconstitution and administration of the cytotoxic drugs, via administration questionnaires and holding interviews with managing medical personnel. Inadequate knowledge and lack of training of the handling personnel and the limited financial resources contributed to inappropriate handling; inadequate handling equipments and greater exposure towards accidents and spills were also noted.

Key Words: Cancer, Cytotoxic, Chemotherapy, Prevalence

INTRODUCTION

Cancer is widely recognized as one of the most formidable human afflictions. It is an increasingly important item on every country's health agenda. Cancer annually affects 10 million people and causes 6 million deaths worldwide. It is expected that 300 million new cases of cancer and 200 million deaths from the disease will occur globally in the next 25 years, with almost two third of cases arising in developing countries (WHO, 1999). Cancer is a neoplastic disorder caused due to the excessive proliferation of cell. It can be treated via different treatment modalities like chemotherapy, surgery, radiation therapy, therapy with the biologic response modifiers and immunotherapy are currently in used. Chemotherapy is the treatment of cancer with drugs that can destroy cancer cells. These drugs often are called "anticancer" drugs. Some drugs work better together than alone, two or more drugs are often given at the same time. This is called combination chemotherapy. In country like Nepal, where the prevalence of the cancer is so high and with the lower treatment modalities, it is necessary to check the management and the handling of the cytotoxic drugs for the better health care.

Objectives

- To study the prevalence pattern of cancer in related hospitals
- To study the management and rationale use of the anti cancerous drugs
- To investigate the handling of cytotoxic drugs

Research hypothesis

- The pattern and prevalence of the different cancers in the two hospitals is more or less similar
- The handling of cytotoxic drugs in the two hospitals is carried out according to the standard guidelines
- The management of the cytotoxic drugs in the two hospitals is rational

MATERIAL AND METHOD

Study site

The study place includes the two major cancer hospitals of Nepal namely, Bhaktapur Cancer Care Centre, Bhaktapur and Om Hospital & Research Centre, Chahabil, Kathmandu.

Study design

Prevalence pattern of cancer

The retrospective study was conducted by reviewing the medical records of the inpatients in the two hospitals. Medical records of the year 2059 to 2061 B.S. were reviewed.

- Age wise distribution of cancer
- Sex wise distribution of cancer
- Top five malignancies
- System wise distribution of cancer cases

Management of cancer

Chemotherapeutic agents given in the major cancer cases were reviewed. Rationality of the chemotherapy was assessed, based on the commonly prescribed regimen, mentioned as standard drug therapy in various primary and secondary sources.

Handling of the anticancer drugs

The study was done with the help of the questionnaires, direct observation of the reconstitution of cytotoxic drug and also interview with the concerned handling personnel. To give more illustration of the handling procedure, photographs of reconstitution & administration were also taken. The study was conducted with reference to the ASHP guidelines (http://www.ashp.org/bestpractices/draft_guidance/Gdl_Handling_HD-D1-refs.pdf)

Sample size

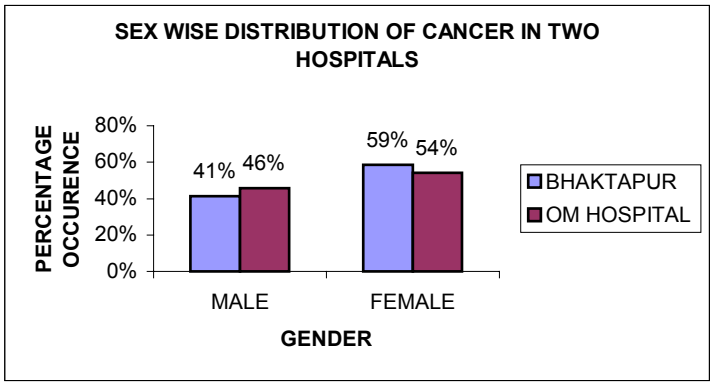
From each hospital 179 cases were studied. The total sample size was 358.

RESULTS AND DISCUSSION

Prevalence Pattern of Cancer

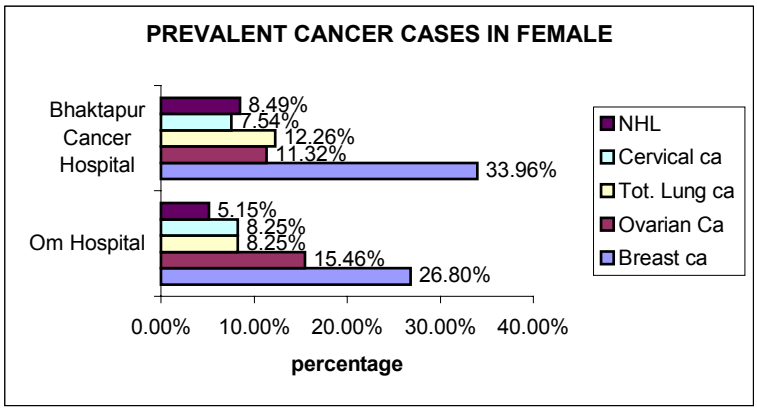
Sex-wise Distribution of Cancer

Cancer cases studied in the two hospitals revealed that the female gender is more susceptible to cancer than male. Cancer in female accounted to about 56.4% of the total cancer cases. Male gender in an average accounted to about 43.5%.



This can be explained on the basis that cancer in female reproductive system such as the cervical cancer, ovarian cancer and breast cancer, occupies the highest average percentage among all other forms of cancers.

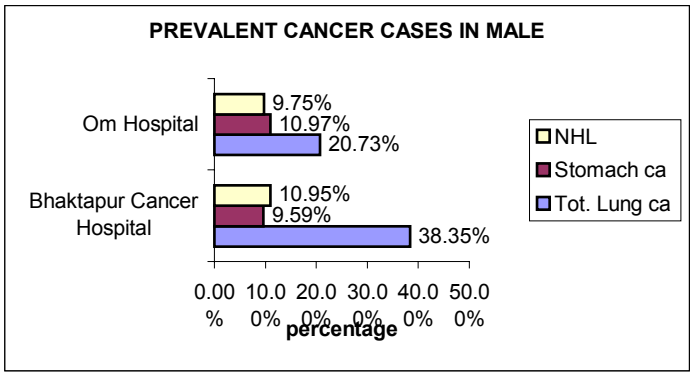
Breast cancer is the most prevalent cancer in females.



Breast cancer is the leading cancer in the world and Nepal is no exception. The risk of developing breast cancer increased at advancing of age of the woman. The most consistent determinant of risk in various populations is the woman's age at first full-term pregnancy. Women with a first full-term pregnancy after age 30, and women who have never borne a child have about a two- to three-fold increased risk of breast cancer compared to women having a full-term pregnancy before age 20. The greater number of women who are delaying childbirth or remaining childless may explain some of the recent increased incidence of breast cancer (http://rex.nci.nih.gov/NCI_Pub_Interface/raterisk/risks120.html)

Early marriage, changing sexual behavior, heavy workload and more children bearing are the major causes of the increasing incidences of the cervical cancer.

The most common cancer in males is the cancer of lungs.

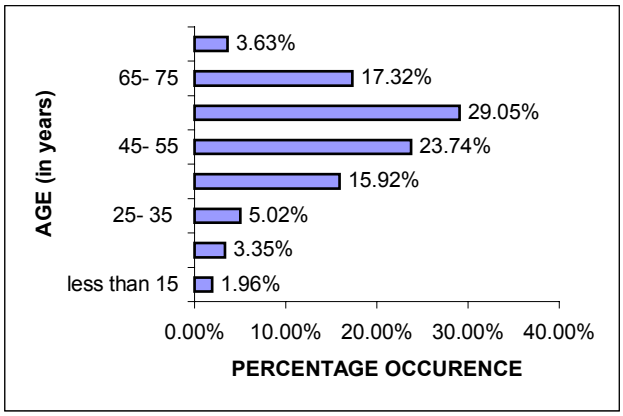


It is estimated that 85% cases of lung cancer is because of tobacco. Further, it is indicated that Nepal has amongst the highest percentage of smokers with males accounting for 49% and female 29%. Thus, males are more prone to cancer. Besides this, exposure prone occupations like agriculture, construction of roads & bridges, manufacturing, and transport, where people are continuously exposed to carcinogens, increases the risk of lung cancer, and male gender are found to be more involved in these occupations

Age Distribution

The separate studies carried out in the two hospitals revealed the same variation pattern in the distribution of age. In both the hospitals, age group of 45-65 years were found to be the most susceptible group, the most common age group being 55- 65 years.

Considering the overall distribution pattern, age group 55- 65 years accounted for about 29.05%, 45- 55 years age group constituted 23.74% of the total; the next susceptible age group being people of age 65- 75 years of age. The incidence of occurrence of cancer was found to be less in children below 15 years of age. This age group in an average constituted about 1.96%.

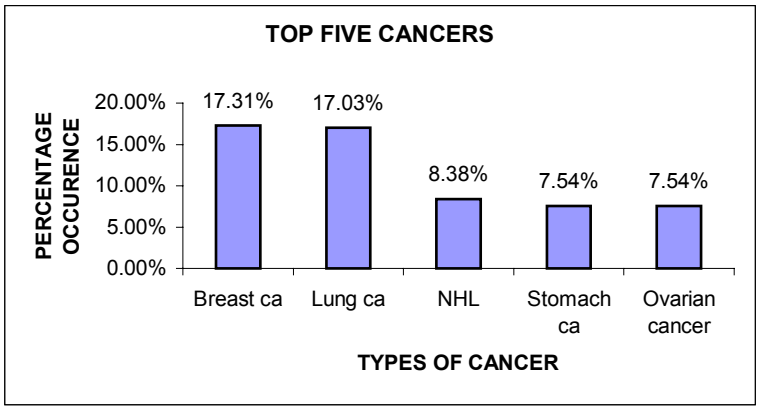


Aging is basically due to the oxidants produced as by- products of normal metabolism. The oxidants such as super oxide and hydrogen peroxide act as the mutagens, causing damage to DNA, proteins and lipids [4]. Thus the occurrence of cancer in the later years of life is generally common. Apart from this, changes that cause a cell to become cancerous take a long time to develop in several phases, depending upon the type of tissue affected, most type of cancer, therefore, become more prominent as one gets older.

Top Five Malignancies Recorded

Top five cancer cases recorded in Bhaktapur Cancer Hospital were: Breast cancer (20.11%), Lung cancer (20.11%), NHL (9.50%), Cervical cancer (7.26%) and Stomach cancer (6.70%) respectively. On the contrary, top five cases of Om Hospital were Breast cancer (14.53%), Lung cancer (13.97%), stomach cancer (8.38%), Ovarian cancer (8.38%) and NHL (7.26%) respectively.

Considering the cases of both the hospitals, five most common cancers were as follows: Breast cancer (17.31%), Lung cancer (17.03%), NHL (8.38%), Stomach cancer (7.54%) and Ovarian cancer (7.54%) respectively.



System wise distribution of cancer cases
Cancer in female reproductive system (average: 31.6%); and in digestive system (average: 25.7%) was most prevalent. Other common cancer cases included cancer in the respiratory system (20.11%), lymphatic system (10.05%), renal system, haemopoeitic system (cancer in blood).

Digestive System
Out of the total cancer in the digestive system, cancer in the tract, like the stomach cancer, colon cancer, rectal cancer, esophageal cancer were the commonest. Besides, cancers of the oral cavity were also detected and very few cases of other cancer were seen. More cases of the cancer of oral cavity (12.20% of the total cases in the digestive system) was detected in the Bhaktapur Hospital, whereas, it was only 3.92% in Om Hospital.

Respiratory System
The most common cancer in this system included the lung cancer and the non- small cell lung cancer (NSCLC). Both combined formed the total cases of the lung cancer.

Lymphatic System
The Non- Hodgkin's Lymphoma (82.97%), and the Hodgkin's disease (17.03%) were the two major cases of cancer in this system. The occurrence of these cases was found to follow similar pattern in the two hospitals.

Since the early 1970s, incidence rates for non-Hodgkin's lymphoma have nearly doubled (http://www.lymphoma.com/page4.html). American Cancer Society predicted over 54,900 people to be diagnosed with NHL in 2000 (http://www.lymphoma.com/page4.html). This supports the increasing incidences of the NHL as revealed by the survey.

Female reproductive System

Unlike in the other systems, distribution pattern in the two hospitals in this case revealed slight variation. Breast cancer was the most common cancer occurring in this system. Cervical cancer (20.63%) was found to be the next common cancer in female reproductive system, in Bhaktapur Hospital, whereas ovarian cancer (30%) occupied the second highest position in Om Hospital. Vulval cancer, though few in numbers were detected in both the hospitals.

Handling of cytotoxic drugs

The study showed that Bhaktapur cancer hospital doesn't follow any specific guidelines but Om hospital was found to follow guidelines for the handling and disposal of the cytotoxic drugs and the source of the guidelines is *Handbook of Oncology.* However, neither of the hospitals have any specific guidelines for dealing with spillage or accidents of any kinds.

It was found from the study that the cytotoxic drugs are reconstituted in the nursing station in Om Hospital and Research Center and in bedside of the patient in Bhaktapur cancer hospital. There is a use of a simple chamber box for the purpose of reconstitution in Om hospital and in Bhaktapur cancer hospital, despite the presence of an isolator it is not in use. The reconstitution of the cytotoxic drugs is performed by paramedical staff in Om hospital and by nurses in the Bhaktapur cancer hospital.

The area for the preparation of the drugs is regularly cleaned in both the hospitals and cleaning is done with spirit and antiseptic solution. Incase of any spillage, the same person reconstituting the drugs i.e. the paramedical staff cleans the spills with gauge and spirit in Om hospital and the nurses clean the spills with spirit in the Bhaktapur cancer hospital.

The study showed that the paramedical staff is involved in the handling of the cytotoxic drugs in Om Hospital whereas the nurses are involved in this work in Bhaktapur cancer care center. These concerned people in both the hospitals lack adequate training in their job but perform their activities based on their experience.

The handling personnel in neither of the hospitals have adequate knowledge in dealing with accidental exposure towards the cytotoxic drugs and also lack the information about the prevention that has to be taken prior to these exposures. However, they do have brief idea about the step to be taken in case of spillages. In both the hospitals, the handling personnel wash with dettol in case of needle pierce and spillage.

The health of the people handling the cytotoxic drugs is considered only in case of pregnancy in both the hospitals. Pregnant women aren't allowed to perform the handling of the drugs.

The major personal protective requirements as gloves, protective clothing, face mask are used in both the hospitals but lack the use of one of the important eye protecting shields as eye glasses and head covers too. Occasionally, cap is used in Om Hospital if the drugs to be reconstituted are very large and in Bhaktapur cancer hospital, plastic gowns are used sometimes.

Both the hospitals have separate containers (buckets) for the disposal of the empty containers of used cytotoxic drugs, administration apparatus, personal protective measures as gloves, masks etc. In Om Hospital, all these disposable materials are collected and burnt separately

from other wastes of the hospital. In Bhaktapur cancer hospital, the method of disposal is different for different materials for e.g., the vials, ampoules, and syringes are dumped whereas gloves, cotton are burnt separately.

The contaminated waste materials are burnt in Om Hospital whereas both burnt and dumped in Bhaktapur hospital.

Management of cancer

The management of cytotoxic drugs in both the hospitals is rational as the drug therapies given in both the hospitals comply with the standard management pattern.

Conclusion

The retrospective study of the medical records of the in patients in Bhaktapur cancer hospital and Om Hospital and research center was done. Based upon the study, the prevalence pattern of cancer, management and handling of cytotoxic drugs was assessed. The following conclusions are drawn accordingly,

- The female gender (56.4 %) are more prone to cancer than male, which accounted to about 43.5% of the total.
- Age distribution revealed 45-65 years as the most susceptible age groups.
- Top five malignancies included: Breast ca (17.31%), Lung ca (17.03%), NHL (8.38%), Stomach ca (7.54%) and Ovarian ca (7.54%) respectively.
- It was found that stomach cancer was the most common in the digestive system, lung cancer in respiratory system, NHL in the lymphatic system and breast cancer in female reproductive system.
- Regarding the management of the cytotoxic drugs, the drug therapy given for different types of cancer in both the hospitals was found to be rational. The pattern of drug therapy to be followed specifically in the specific type of cancer was followed.
- The study revealed that limited financial resources, inadequate knowledge and lack of training of handling personnel were the contributing factors for inappropriate handling of cytotoxic drugs. It was found to be associated with non-compliance with the guidelines, lack of handling equipment and greater risk of exposure towards accidents and spill.

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