ORIGINAL ARTICLE

Prevalence of Various Types of Cancers in Industrial Population

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ABSTRACT

Objective: Identification of different types of cancers in industrial workers who are exposed to industrial chemicals and carcinogens.
Methods: This study was conducted on 100 confirmed cases of cancer at Social Security Hospital, Multan Road Lahore and Institute of Molecular Biology and Biotechnology, The University of Lahore from January 2011 June 2011. The patients were admitted in cancer ward and belong to industrial workers. The patients aged from 20-60 and both male and females were included. The biopsies of cancerous tissue or piece of suspected growth were received after a surgical procedure. The size of various samples ranged from 10-25 cm in size and kept in 10% formalin for 2 hours for fixation.
Results: There were 65 males and 35 females with male to female ratio was 1.8:1. Age range of these patients was 17 to 65 years with mean age 41.0±11.7 years. Among lymphoma, non-Hodgkin lymphoma was more than Hodgkin lymphoma (out of 19 patients, 13 had non-Hodgkin and 6 had Hodgkin lymphoma). Out of 14 patients of sarcomas, 5 had Ewing sarcoma, 4 had chondrosarcoma, 3 had fibrosarcoma and 2 had liposarcoma.
Conclusion: The contributing factors such as genetic causes, viral infections (hepatitis B, C and AIDS), smoking, drug addiction, environmental pollution and low level of awareness also play important in etiology of cancer.
Keywords: Prevalence, Cancer, Industrial population, Types

INTRODUCTION

The industrial activities are responsible for environmental contamination, mainly due to heavy metals, asbestos, polycyclic aromatic hydrocarbons, organic solvents, polychlorinated biphenyls and dioxin.[1] In industrialized countries more than one in four people will die from the disease, a rate more than twice as high as developing countries. The most important carcinogens include tobacco, aflatoxins and ultraviolet light. Industrialization has been suggested to be a major factor in the prevalence of cancer and occupational exposures to occupational carcinogens have been indentified in the last 25 years[2]. Cancer has emerged as a major public health problem in developing countries for the first time, matching its effects in industrialized nation[3]. Global cancer rates are expected to increase 50% to 15 million by year 2020[4,5]. It has been reported that 10 million people developed malignant tumors and 6.2 million died from the disease in the year 2000[5-7]. Manning showed that relationship between laryngeal cancer and occupational exposure to mustard gas manufacturing, nickel refining and metal working with mineral-based oils[8-10]. nunasal cancer is associated with refining, furniture making, boots and shoe manufacturing and repair, pigment manufacturing and dial painting[11,12].

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One of the most important dangers of industries/factories is related to human health especially to those who work in factories. Some industrial processes include drilling, polishing, crushing and sawing. Industrial dust is often much smaller than ordinary dust in air, so it can avoid being trapped by mucosa in air passage. Evidence as to the health risk posed by residing in the vicinity of such polluting industries is limited, with cancer and congenital malformations being most widely studied health problems[13-15]. People working at industrial workplace have developed various diseases because of exposure to a number of chemical substances which are used on large scale in industries. In the present study, we have attempted to make thorough epidemiological observation of cancer incidence in industrial population.

METHODOLOGY

This case-control study was conducted at Social Security Hospital, Multan Road Lahore and Institute of Molecular Biology and Biotechnology, The University of Lahore from January 2011 June 2011. One hundred confirmed cases of cancer were included. The patients were admitted in cancer ward and belong to industrial workers. The patients aged from 20-60 and both male and females were included. Any previous medical history prior to present work was taken. An account of investigations which helped the patients for confirmation of final diagnosis of cancer was taken. These included a range of tests like routine blood examination, specific biochemical tests, radiographs, ultrasound tests, magnetic resonance imaging (MRI), computed

tomography (CT) scans, biopsies of suspected cancer tissues and their histopathological studies. Samples were received after a surgical procedure. These were either biopsy of cancerous tissue or piece of suspected growth. The size of various samples ranged from 10-25 cm in size and kept in 10% formalin for 2 hours for fixation.

RESULTS

Out of 100 cases, there were 65 males (65%) and 35 females (35%) with male to female ratio was 1.8:1. Age range of these patients was 17 to 65 years [mean age 41.0±11.7 years] (Table 1). Prevalence of cancers among 100 industrialized patients, 21 had Ca lung, 19 had lymphoma, 14 had sarcoma, 13 had Ca breast, 6 had Ca prostate, 4 had Ca liver, 3 patients each in Ca colon, Ca ovary and 3 Ca testis, 2 patients each in leukemia, multiple myeloma, Ca gallbladder and Ca stomach, 1 patient each in Ca esophagus, Ca tongue, Ca parotid, Ca rectum, Ca cervix and 1 had Ca larynx respectively. Among lymphoma, non-Hodgkin lymphoma was more than Hodgkin lymphoma (out of 19 patients, 13 had non-Hodgkin and 6 had Hodgkin lymphoma). Out of 14 patients of sarcomas, 5 had Ewing sarcoma, 4 had chondrosarcoma, 3 had fibrosarcoma and 2 had liposarcoma (Table 2).

Table 1: Frequency & %age of genders and ages (n=100)

Variable	**No.**	**%**
Gender		
Male	65	65.0
Female	35	35.0
Age (years)		
17 – 35	29	29.0
36 – 50	48	48.0
51 – 65	23	23.0

Table 2: Prevalence of various cancer in industrial population (n=100)

Types of cancer	**No.**	**%**
Ca Lung	21	21.0
Lymphoma	19	19.0
Sarcoma	14	14.0
Ca Breast	13	13.0
Ca Prostate	6	6.0
Ca Liver/gallbladder	6	6.0
Ca Ovary	3	3.0
Ca Testis	3	3.0
Ca Colon	3	3.0
Ca Stomach	2	2.0
Multiple myeloma	2	2.0
Leukemia	2	2.0
Ca Parotid	1	1.0
Ca Larynx	1	1.0
Ca Esophagus	1	1.0
Ca Rectum	1	1.0
Ca Cervix	1	1.0
Ca Tongue	1	1.0

DISCUSSION

The workers working in different industries are exposed to various chemicals at their work place. Most of these chemicals substances act as carcinogens and contribute to etiology of cancer in factor workers. The highest frequency was of lung cancer , and this was expected as shown in international studies as a result of smoky coal[16], air pollution[17,18], industrial exposure[19]. Haemolymphopoietic cancer were the next common cancers found in this study and internationally it is has been shown to be more common in among polyvinyl chloride workers.[20] Moreover a study from Hyderabad Pakistan also showed lymphomas to be only second to oral cancers.[21] In our study Sarcoma were the third most common cancer found although studies from Britain show that it constitutes only a minor fraction of all cancers detected[22]. Studies suggest a possible association between air pollution and female breast cancer in US[23]. A Pakistani study showed the frequency of breast cancer to be 22%[21] while our study showed it to be 13%. The markers of carcinogenic ill-being in the contiguous rural areas were the incidence of cancer of the lip, esophagus, stomach, larynx, cervix uteri, uterine appendages, and prostate and leukemia.[24] Our study showed the frequency of prostate cancer to be 6%. Ramis and other workers found that evidence of association between the spatial distribution of prostate cancer mortality aggregated by census tracts and proximity to metal industrial facilities located within the area, after adjusting for socio-demographic characteristics at municipality level[25]. Diverse studies have consistently demonstrated a higher risk of prostate cancer in agricultural populations than in the general population[26]. On the other hand workers have determined that breast, ovarian and prostate cancer, are unlikely to be linked to tobacco use[27]. Spanish workers have showed that mortality due to certain tumors of the digestive system increases with proximity (</=5 km) to a greater number of metal industry sources[28,29]. Our study showed that 6% of our patients suffered from liver/gall bladder cancers. Numerous studies have showed that there is statistically significant increase in the risk of dying from reproductive cancers in towns near incinerators and installations for the recovery or disposal of hazardous waste[14]. 6% patients in our study had reproductive cancers and this is consistent with international studies[30].

Previous studies have indicated that farm workers may be at increased risk of gastric cancer.[31] In the present study the frequency of gastric cancer was 2% and was associated with use of the acaricide propargite and the herbicide triflurin. Colonic cancers have been found to be associated with industrial waste[14] and they were found in 3% of our patients. Spanish workers have shown the existence of an association between risk of dying due to some

tumors of the digestive system and residential proximity to the Spanish metal production and processing installations studied.[32] It has been consistently demonstrated that the markers of carcinogenic ill-being in the contiguous rural areas were the incidence of cancer of the lip, esophagus, stomach, larynx, cervix uteri, uterine appendages, and prostate and leukemia.[24] Moreover the mortality from laryngeal cancer declined with distance from the sources of pollution.[33] Our study showed that the frequency of laryngeal cancer was 1%.

CONCLUSION

There is a need to generate a more attractive basic research environment, supported by high quality education, suitable research funding, research infrastructure, and science-innovation links, where top quality researchers can be recognized. Industry also needs high-quality research including implementation of the knowledge generated through basic research, as a basis for competitiveness.

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