Changing pattern of malignancies: analysis of histopathology based tumour registry data and comparison of three decades at

Pages with reference to book, From 27 To 30

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Abstract

Objective: To assess the pattern of malignancies from tumour registry data and to find any changing pattern by comparing corresponding data from earlier periods.
Methods: The descriptive study was carried out at the Department of Histopathology, Armed Forces Institute of Pathology (AFIP), Rawalpindi, Pakistan. All malignant tumours from 2002-2011 were analysed for age groups, gender distribution, and type of tumour with relation to the site. Tumours of paediatric age group were also assessed separately. Comparison with national and international studies and the data of previous decades - 1977-1988 and 1992-2001 was done to find any changing pattern. SPSS 15 was used for statistical analysis.
Results: A total of 32718 malignant tumours were analysed. Of them, males were 19191 and 13527 were females (M:F ratio: 1.4:1). Majority of the patients were between 50-70 years of age. In males, urinary bladder tumours 2153 (11.2%), followed by combined lymphoma/leukaemia 2020 (10.5%) and prostate 1825 (9.5%) were top three malignancies, whereas in females breast 4178 (30.9%) was the commonest. Comparison of different decades showed that in males in the first monograph lymphoma was the commonest, then it was prostatic carcinoma in the second monograph, and now tumours of urinary bladder were on top position. In females, carcinoma cervix, which was at number 5 and 9 in the two earlier monographs was not found in the list of current 10 common tumours.
Conclusion: The study showed some interesting features, particularly in male malignancies and those related to urinary bladder tumours. The persistent increasing frequency of breast carcinoma in females is also alarming, and requires extensive efforts of awareness, screening and early detection programmes.
Keywords: Tumour registry data, Carcinoma breast, Lymphoma, Prostatic carcinoma. (JPMA 64: 24; 2014).

Introduction

Presently there is no population-based cancer registry in Pakistan for the whole country. When such registries are not available, hospital/institution-based registries play a very important part in systematic collection of data.[1] The tumour registry of the Armed Forces Institute of Pathology (AFIP), Rawalpindi, Pakistan, was established in 1960. Different studies and monographs based on the data from different centres including AFIP, have been published by Pakistan Medical Research Council (PMRC).[2-4] In addition, AFIP also published its first monograph in 1990, based on its own tumour registry data titled, "Pattern of malignant tumours in northern Pakistan".[5] A special monograph on the perspective of Non-Hodgkin lymphoma (NHL) in Pakistan was published in 1993. The monograph was based on detailed data analysis of NHL collected during 1984-1990.[6] Analysis of cancer data between 1992-2001 was published in another monograph published in 2005, which showed some interesting facts and differences from the previous one.[7] Variation/change in the pattern of malignancies is observed due to many reasons, including changes in the environments, eating habits, infections, and

control/preventive programme of one top malignancy may automatically bring some other malignancy on top. The AFIP is publishing its data regularly after every 10 years and the latest monograph was published in 2012.[8] The present study was based mainly on the data analysed in that monograph and different variations found in the pattern of malignant tumours over the years (three decades) was assessed.

Materials and Methods

The study was carried out at the Histopathology department, Armed Forces Institute of Pathology (AFIP), Rawalpindi, which is a tertiary care referral laboratory receiving samples from military hospitals and as well as civil, public and private-sector hospitals from upper Punjab, Khyber Pakhtunkhwa and the adjacent Rawalpindi-Islamabad region. All the malignant tumours registered in tumour registry and analysed in the three monographs were included in the study. The study period extended from 2002-2011 data with comparison of data from 1977-1988,[5] first monograph and 1992 to 2001,7 second monograph. In the tumour registry, basic epidemiological data is entered from the patient directly or from the attending doctors. Each malignant tumour diagnosed is assigned an International Classification of Diseases-in Oncology (ICD-O) code,[9] published by the International Agency for Research on Cancer (IARC). The malignant tumours were calculated for each year, for gender distribution, age groups of different decade, paediatric age groups etc. The data was analysed using SPSS version 15.

Results

The study period extended from 2002-2011 data with comparison of data from 1977-1988, first monograph, and 1992-2001, second monograph. Total number of patients in the first monograph were 14018 (male=8112 and females =5906) and in the second monograph 21,168 (male=12584 and female=8584).

In the present series, a total of 32718 malignant tumours were analysed. On an average each year, 3270 malignant tumours were being diagnosed and registered. Overall, males were 19191 and 13527 were females. Male-to-female ratio was 1.4:1. Majority of the patients (39% males and 35% females) were between 50-70 years of age. A total of 1193 (3.6%) patients were in the paediatric age group. The total 10 common malignant tumours in males, females and paediatric age group were located (Table-1).

Table-1: Ten commonest malignant tumours in total (n=32718) and Paediatric age groups (n=1193).

	Adults		Paediatric age group	
S.No	Males (n=19191) Tumour type (%)	Females (n=13527) Tumour type (%)	Males (n=793) Tumour type (%)	Females (n=400) Tumour type (%)
1	Urinary Bladder (11.2%)	Breast (30.9%)	Primary Lymph node (21.3%) (NHL & HD)**	Primary Lymph node* (14.5%) (NHL & HD)**
2	Prostate (9.5%)	Skin (7.1%)	Brain (12.3%)	Brain (11.5%)
3	Primary Lymph node* (7.7%) (NHL & HD)**	Primary Lymph node*i (4.4%) (NHL & HD)**i		Leukaemia (10.2%) Eye (10.2%)
4	Skin (7.2%)	Ovary (4.2%)	Bones (8.9%)	Bones (10%)
5	Colorectal (5.0%)	Colorectal (3.5%)	Eye (7.3%)	Soft tissue (9.5%)
6	Bones & joints (4.4%)	Bones & joints (3.1%)	Soft tissue (6.0%)	Leukaemia (7.7%)
7	Stomach (4.1%)	Soft tissue (2.24%)	Kidney (3.9%)	Ovary (6%)
8	Brain (3.5%)	Stomach (2.23%)	Skin (2.4%)	Kidney (4%)
9	Larynx (3.3%)	Thyroid (2.1%)	Testis (2.0%)	Colorectal (2.5%)
10	Soft tissue (3.2%)	Brain (2.04%)	Colorectal (1.9%)	Skin (2.3%)

*There were 540 cases of leukaemia diagnosed on trephine, if combined, then lymphoma/leukaemia (n=2020, 10.5%) becomes the second commonest after Bladder. ** NHL (Non Hodgkin lymphoma), HD (Hodgkin disease).

*i There were 222 cases of leukaemia diagnosed on trephine, if combined, then lymphoma/leukaemia (n=811, 6.0%) were still third commonest after breast & skin. **i NHL (Non Hodgkin lymphoma), HD (Hodgkin disease).

Analysis and comparison of tumours of different decades showed some interesting observations, particularly in males. In the initial analysis, Lymphoma was on top of the list, whereas in the next two it was prostate and tumours of urinary bladder respectively which gained the top position (Table-2).

Table-2: Comparison of ten commonest tumours in males in different decades.

S.No	1977-1988 (n=8112)[5]		1992-2001 (n=12584)[7]		2002-2011 (present study n=19191)	
	Site	n (%)	Site	n (%)	Site	n (%)
1	Lymph node	779 (9.6%)	Prostate	1189 (9.4%)	Urinary Bladder	2152 (11.2%)
2	Leukaemia	730 (9.0%)	Skin	1055 (8.4%)	Prostate	1825 (9.5%)
3	Bronchus	584 (7.2%)	Lymph node	1051 (8.4%)	Lymph node	1480 (7.7%)
4	Skin	544 (6.7%)	Leukaemia	986 (7.8%)	Skin	1388 (7.2%)
5	Prostate	535 (6.6%)	rinary bladder	965 (7.7%)	Colorectal	974 (5.0%)
6	Colorectal	446 (5.5%)	Colorectal	802 (6.4%)	Bones	845 (4.4%)
7	Urinary bladder	357 (4.4%)	Bones	554 (4.4%)	Stomach	790 (4.1%)
8	Bones	308 (3.8%)	Lungs	472 (3.8%)	Brain	670 (3.5%)
9	Stomach	227 (2.8%)	Stomach	408 (3.2%)	Larynx	636 (3.3%)
10	Soft tissue	203 (2.5%)	Liver	354 (2.8%)	Soft tissue	618 (3.2%)

In females, there was not much difference and breast malignancies remained on top of the 10 common malignant tumours. Not only it remained on top, but its frequency rather increased in the present series (Table-3).

Table-3: Comparison of ten commonest tumours in females in different decades.

S.No	1977-1988 (n=5906)[5]		1992-2001 (n=8584)[7]		2002-2011 (present study n=13527)	
	Site	n (%)	Site	n (%)	Site	n (%)
1	Breast	1571 (26.6%)	Breast	2235 (26.0%)	Breast	4178 (30.9%)
2	Skin	331 (5.6%)	Skin	737 (8.5%)	Skin	959 (7.1%)
3	Ovary	284 (4.8%)	Leukaemia	422 (4.9%)	Lymph node	589 (4.4%)
4	Leukaemia	266 (4.5%)	Ovary	411 (4.8%)	Ovary	568 (4.2%)
5	Cervix	248 (4.2%)	Colorectal	331 (3.9%)	Colorectal	466 (3.5%)
6	Lymph node	219 (3.7%)	Lymph node	282 (3.3%)	Bones	415 (3.1%)
7	Colorectal	207 (3.5%)	Bones	279 (3.3%)	Soft tissue	304 (2.2%)
8	Gall bladder	201 (3.4%)	Liver	242 (2.8%)	Stomach	303 (2.2%)
9	Thyroid	181 (3.06%)	Cervix	231 (2.7%)	Thyroid	285 (2.1%)
10	Bones	136 (2.3%)	Gall bladder	214 (2.5%)	Brain	276 (2.0%)

The other striking feature was that of carcinoma cervix, which was at number 5 and 9 in the previous two monographs, but was not found in the list of current 10 common tumours. There was not much difference in paediatric malignancies, and lymphoma/leukaemias remained on the top.

Discussion

The present study showed some interesting observations. Overall, there was increase in the total number of the patients registered for the malignant tumours during the 10 year data analysis compared to our previous two monographs.[5,7] Although there was increase in population, but this increase in

registration was statistically significant (p=0.0001), meaning thereby that either there is increase in number of the cases or increased numbers are being subjected to histopathology, which was not done previously. In males, the urinary bladder tumours were at number 7 and 5 in our previous two analyses, but in the present series these were the commonest, showing an upward trend.[5,7] The pattern is like North African and Western Asian countries and the same is observed in Karachi studies as well;[10-15] probably similar factors like smoking, environmental pollutants etc are operating as schistosomiasis is rarely seen in Pakistan. The prostatic cancer is for the second time found comparable to risk reported in the American and African countries as well as in studies from Western, Northern European and Oceania countries.[15,16]

The present study also showed CNS tumours in the list of 10 commonest tumours in both genders, which were not so in the previous two analyses.[5,7] These tumours were also very frequent in the paediatric age group. It probably could be that now more and more neurosurgical procedures are being performed and neurosurgical treatment is also available in more centres than it was done previously. Laryngeal tumours in males also showed a rising trend and made their appearance in the 10 common tumours list. Steady increase of this malignancy has been reported in UK.[17] The frequency of lymphoma and leukaemia remained steady during all these analyses in adults as well as in children.[5-7] As per a World Health Orgnisation (WHO) report, NHL is more common in developed countries (>50% of the total cases). Areas of moderate to high incidence are also reported in other parts of the world.[15] The increase in the developed world is attributed to better diagnostic facilities and possibly as complication of acquired immunodeficiency syndrome (AIDS). In some of the developed countries, the top position of lymphoma may be due to immunosuppression as a result of very high incidence of many infections, particularly viral infections like Epstein-Bar viral infection, but extensive studies are required to find exact association with these infections.

In males, comparison with Karachi studies showed urinary bladder, prostate and lymph node in five commonest tumours, as in the present series, but lung and oral cavity tumours were on top of the list in Karachi studies.[10-12] The contributory factors could be more industrial areas, increasing traffic load and extensive betel nut chewing with tobacco, as was found in a case control study of Karachi where tobacco was strongly suspected to be the causative agent.[10]

Surprisingly, urinary bladder and prostate tumours were not reported as five commonest in a study at Shoukat Khanum Memorial Cancer Hospital, Lahore.[13] An Indian study also showed prostate as the second commonest,[14] but the WHO report of less developed countries did not show urinary bladder, prostate, lymph node and skin in their five commonest tumour, contrary to what was found in the present analysis.

In females, there was not much change in the pattern as breast carcinoma remained on top in line with most studies of the world.[3-5,7-15] The other change from international studies which was again found in all our previous analyses also was that of carcinoma ovaries.[5,7,15] This malignancy was on the top of gynaecological malignancies. Possibly this is due to relative rarity of cervical cancer. The cervical cancer was not even included in the top 10 of the present series. Even endometrial tumours were more frequent than cervical malignancies. The skin tumours were quite frequent not only in females, but also in males; these were second most frequent after the breast. In children, the pattern remained almost the same as in our previous observations. Lymphoma and Leukaemias remained the commonest and almost same is observed in the other studies from Karachi and Lahore, Pakistan.[13,18]

Conclusion

The institution-based tumour registry data showed some interesting features particularly in males. To

exclude the possibility of institutional biases, multi-centre studies are required to establish the trend of increase in urinary bladder cancer in Pakistan. The persistent increasing frequency of breast carcinoma in females is also alarming, and requires extensive efforts of awareness, screening and early detection programmes.

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