

## RESEARCH ARTICLE

# Audit of Cancer Patients from Eastern Uttar Pradesh (UP), India: A University Hospital Based Two Year Retrospective Analysis

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### Abstract

**Background:** A retrospective analysis of all cancer patients attending the radiotherapy outpatient department (OPD) of a single unit during the period of January 2005 till December 2006 was conducted to know the geographical distribution and incidence of the most common cancers, their stage of presentation, treatment compliance among the patients and follow-up. **Materials and Methods:** A total of 4,484 patients were registered in the Institute of Medical Sciences, Banaras Hindu University during the period of January 2005- December 2006; of which 1,975 registered in an individual unit were included for the retrospective analysis. **Results:** Most of the patients hailed from the various districts of UP and Bihar. Females outnumbered males with a ratio of 1.33:1. Females mostly belonged to the age group of 40-59 years; whilst males were a decade older. Major cancer sites in females were cervix and breast followed by head and neck. Leading cancer sites in males were head and neck, brain, bone, soft tissue and lung. Most of the cases presented in advanced stage of disease (74%). Squamous cell carcinoma was the most common histopathology (56%). A significant proportion of patients defaulted after undergoing preliminary investigations (16%). Only 53.9% of females and 58.5% of males took treatment out of which 68% and 63% completed the prescribed treatment. Compliance with follow-up was poor. **Conclusions:** The outcome of this study will significantly help us to define region specific strategies needed for cancer management in eastern Uttar Pradesh.

**Keywords:** Cancer audit - retrospective analysis - cancer incidence - treatment - compliance to follow-up

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### Introduction

The global burden of cancer (WHO, 2008) continues to rise because of aging and growth in world population; more so in the developing nations due to adoption of cancer promoting habits like smoking, sedentary lifestyle, and western-type diet structure. Based on the Globocan, (2008) estimates (<http://globocan.iarc.fr>. 2010), about 12.7 million cancer cases and 7.6 million cancer deaths are estimated to have occurred in 2008; of these, 56% of the cases and 64% of the deaths occurred in the economically developing world (Jemal et al., 2011). India remains one of the densely populated countries of the world along with China accounting for about 18% of the total world population (UN. World Population Prospects, 2009). The population of India on 1st March 2011 was 1,210.2 million as per the provisional population totals of Census of India, 2011 (<http://censusindia.gov.in/2011-prov-results/indiaatglance.html> accessed on 25.7.2012).

Until 1964, information on cancer occurrence in India was available from surveys. Initiation of population based cancer registries (PBCRs) at Bombay (1964), Pune

(1973), Aurangabad (1978), and at Ahmedabad and Nagpur in 1980, started the availability of data on cancer incidence. However, the boost for cancer registration occurred in 1982, through initiation of National Cancer Registry Programme (NCRP) by Indian Council of Medical Research (Annual Report 1982). The NCRP began with three population based (Bombay, Bangalore and Madras), and three hospital based registries (HBCRs) (at Chandigarh, Dibrugarh and Trivandrum) (Annual Report 1983-1986). Further, expansion of NCRP saw the initiation of urban and rural PBCRs at Bhopal and Delhi and at Barshi (Maharashtra) in 1987, (Annual Report, 1987) and HBCRs at Bangalore, Bombay and Madras in 1986 (Annual Report, 1986). The data from cancer registries helped in highlighting the magnitude, geographical disparities and common sites of cancer in India (ICMR, Bangalore 2002).

The cancer registries have provided since 1982, (Annual report 1982-1987) an idea of the magnitude and pattern of cancer in selected urban centres and in a couple of rural pockets. However, large areas of population especially rural remain uncovered and therefore the

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patterns of cancer in several urban centres and rural areas remain largely unknown. (ICMR, April 2002).

India is a vast country with varied cultures and habits. Geographic differences exist in patterns of cancer observed among the different registries (ICMR, 2002). For example, cancer of the gall bladder (GB) has high incidence in the PBCRs of Delhi; especially rural Delhi (Manoharan et al., 2010) and Bhopal, while cancer of the nasopharynx has been the one of the consistent leading cancer site among males in Sikkim (ICMR, 2006; Verma et al., 2012) and Mizoram.

UP is the fifth largest Indian state by area; it covers 93,933 square miles (243,290 km<sup>2</sup>), equal to 6.88% of the total area of India, and with over 200 million inhabitants as of 2011, it is the most populous state in the country as well as the most populous country subdivision in the whole world. Most of its population (about 150 million) resides in the rural area (Census, 2011) Though there have been few reports like spectrum of malignancies from Allahabad, spectrum of pre-malignant and malignant cervical epithelial lesions in post menopausal women; which were a hospital based study (Mehrotra et al., 2008, Ansari et al., 2012), as such no proper registry exists in the state. There is an essential need for information regarding site, stage, status, disease extension of cancer at first presentation to develop a comprehensive and effective cancer management policy which will be suitable for eastern U.P. The present study was carried out in with an aim to describe the magnitude of cancer, stage or status of first presentation, compliance to treatment and follow up.

## Materials and Methods

The present study was carried out in the department of Radiotherapy, Institute of Medical Sciences (IMS), Banaras Hindu University (BHU) with effect from January 2007 to December 2008. The study comprised retrospective analysis of patients attending Radiotherapy OPD during the above mentioned period registered in a single unit.

All the patients were assessed as per available records on detailed history, complete clinical examination and investigations which included hematological (complete blood count), biochemical (renal and liver function tests), and radiological investigations (x-rays, ultrasound, CT scan and MRI according to the need for staging and patients' affordability) performed before actual treatment start, during treatment and subsequently during follow up. Most of the patients presented with histopathology report. Rest were either referred for histopathological diagnosis or done in the department itself. Some were referred for review of pathological diagnosis to the Department of Pathology. Clinical staging and grouping were done according to TNM (UICC- AJCC staging, 6<sup>th</sup> edition) classification. A total of nineteen hundred and seventy five patients included for the present study; were subjected to analysis regarding their geographical distribution, age of presentation, gender predominance, histopathology, site of disease, stage and status of presentation, compliance to treatment and follow up.

There was no prefixed protocol regarding treatment of the patients as they came either as fresh cases (no prior treatment received) or had been referred to us after receiving primary treatment elsewhere. Treatment policy was decided on the basis of first presentation at the time of registration. Usual policy was radical radiotherapy, chemo-radiotherapy, palliative radiotherapy and pre-op radiotherapy. Based on site, stage and; status of presentation; patients were treated either with chemo-radiotherapy or radiotherapy alone. Radiotherapy was delivered using appropriate portals; radiotherapy planning was done either on conventional simulator (Shimadzu) or on the treatment planning system (RAD PLAN 2D). Treatment was delivered by Co-60 Teletherapy unit (Phoenix/Theratron780E). Gynecological cancers were also treated with appropriate brachytherapy procedure (intra-cavitary application) on after loading units; manual (BARC applicators) or remote (Selectron). Patients were kept on follow up [calculated from the date of first follow-up] on monthly basis for first 3 months, 3 monthly for the next 1-2 years followed by 6 monthly intervals. During follow-up, complaints of patients were noted, assessed clinically, investigated and treated accordingly. The data was recorded on pre-designed proforma, managed on Excel spreadsheets and entries were checked for errors. Data thus obtained was subjected to analysis.

## Results

Out of a total registration of 4484 new patients in the department during the period of Jan 2005-Dec 2006, 1975 patients registered under a single unit were included in this study.

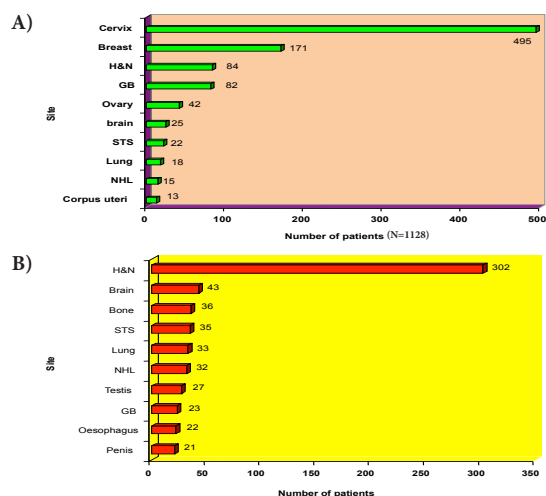
Of 1975 patients, 1322 (66.68%) were natives of the various districts of Uttar Pradesh (UP). Rest 33% hailed from various districts of bordering states like Bihar, Madhya Pradesh and others (Table 1). There were 1128 females (57%) and 847 males (43%); thus the male to female ratio was 1:1.33. Out of 1128 females, 604 (53.54%) patients belonged to the 4<sup>th</sup>-5<sup>th</sup> decade of life. In case of males; 418 (49.35%) patients belonged to the 5<sup>th</sup>-6<sup>th</sup> decade of life (Table 1).

Ten leading cancer sites in males and females have been enumerated in Figures 1. Cervix was found to be the leading cancer site in females [n=495 (43.88%)], followed by Breast (n=171 (15.15%)), Head and Neck (H&N) [n=84 (7.44%)], Gall Bladder (GB) [n=82 (7.27%)], Ovary [n=42 (3.7%)], Brain [n=25 (2.21%)], Soft Tissue Sarcoma (STS) [n=22 (1.95%)], Lung [n=18 (1.59%)], Non Hodgkin's Lymphoma (NHL) [n=15 (1.32%)] and corpus uteri [n=13 (1.15%)]. H&N cancers formed the main bulk of disease in case of males [n=302 (35.65%)] followed by brain tumours [n=43 (5.07%)], bone tumours [n=36 (4.25%)], STS [n=35 (4.13%)], Lung [n=33(3.8%)], NHL [n=32 (3.7%)], Testis [n=27 (3.18%)], GB [n=23 (2.71%)], Oesophagus [n=22 (2.59%)], and Penile cancers [n=21 (2.47%)].

Stage was known for 1034 (52.35%) patients only. Most of the patients presented with advanced stage of disease with stage III & IV accounting for 770/1034

**Table 1. Patient Demography (N=1975)**

		Number (%)
Sex	Female	1128 (57)
	Male	847 (43)
State	Assam	2 (0.10)
	Bihar	549 (27.80)
	Chhattisgarh	10 (0.51)
	Jharkhand	31 (1.57)
	Madhya Pradesh	48 (2.43)
	Maharashtra	1 (0.05)
	Rajasthan	1 (0.05)
	Uttar Pradesh	1322 (66.68)
	Uttaranchal	1 (0.05)
	West Bengal	2 (0.10)
	Nepal	8 (0.41)
Age Group (Male)	0-9	27 (3.18)
	10-19	28 (3.30)
	20-29	63 (7.43)
	30-39	84 (9.91)
	40-49	135 (15.93)
	50-59	216 (25.50)
	60-69	202 (23.84)
	70+	92 (10.86)
Age Group (Female)	0-9	10 (0.88)
	10-19	23 (2.03)
	20-29	34 (3.01)
	30-39	169 (14.98)
	40-49	315 (27.92)
	50-59	289 (25.62)
	60-69	219 (19.41)
	70+	69 (6.11)
Stage	Stage known	1034 (52.35)
	I	38 (3.67)
	II	226 (21.85)
	III	409 (39.55)
	IV	361 (34.91)
Stage unknown	941 (47.64)	
Histopathology	Carcinoma	1289 (79.27)
	Subtypes	
	Squamous cell carcinoma	724 (56.16)
	Adenocarcinoma	225 (17.45)
	Others	340 (26.37)
Sarcoma	60 (3.69)	
Others	277 (17.03)	



**Figure 1. A) Ten Leading Cancers Sites in Females; and B) Ten Leading Cancers Sites in Males (H&N-Head and Neck, GB-Gall Bladder, STS-Soft Tissue Sarcoma, NHL-Non Hodgkin's lymphoma)**

patients (74.46%). Histopathological diagnosis was available for 1626 (82.32%) patients. Carcinomas were most common [79.27% (n=1289)]; sarcomas were 60 (3.69%) in number, rest 277 (17.03%) cases had other histopathological diagnoses (lymphoma, leukemia, brain tumours, etc). Squamous cell carcinoma (SCC) was the most common subtype [56.16% (n=724)] followed by adenocarcinoma [17.45% (n=225)]. 26.37% were other varieties of carcinoma (epidermoid, small cell, verrucous etc).

Most of the cases [n=1254 (63.49%)] at presentation were fresh cases; they had not received any prior treatment elsewhere. Rest 721 (36.51%) patients had received some form of interventional therapy; either surgery, chemotherapy, radiotherapy or a combination of them at other departments or outside set up before they came to seek opinion in our department (Table 2); among them 17 (0.86%) patients had metastatic disease, 39 (1.97%) had recurrent disease, residual disease was present in 15 (0.75%) patients, 11 (0.55%) cases had progressive disease and 1 (0.05%) case of relapse was present.

Majority of the patients were planned for external beam radiotherapy either with a curative or palliative intent. Chemo-radiotherapy was planned for patients with advanced disease (Table 3). Significant number of patients [(n=321) 15.79%] defaulted after undergoing preliminary investigations (DPI). Out of a total of 1128 females, 1001 (88.74%) were planned for treatment out of which 540/1001 (53.94%) patients took treatment either in the form of surgery, radiotherapy, chemotherapy or a combination of the three. 370/540 (68.51%) patients

**Table 2. Status of First Presentation and Prior Treatment Received (N=1975)**

		Number (%)
Status	Fresh	1254 (63.49)
	Prior treatment	721 (36.51)
Prior treatment	Surgery (S)	611 (84.74)
	Chemotherapy®	41 (5.68)
	S+C	36 (1.82)
	Radiotherapy®	14 (0.70)
	C+R	11 (0.55)
	S+C+R	8 (0.40)

**Table 3. Different Plans Made According to First Presentation and % of Treatment Taken (N=1663)**

Plan	No. (%)	Treatment taken (%)
RT	613 (31.03)	323 (52.69)
CT-RT	809 (40.96)	473 (58.46)
CT	241 (12.20)	131 (54.35)

\*RT: Radiotherapy; CT: Chemotherapy (NB-312 patients DPI)

**Table 4. Treatment Details According to Sex (N=1975)**

Treatment details	Males	Females
	N (%)	N (%)
DPI	185 (21.95)	127 (11.67)
Planned	662 (78.15)	1001 (88.74)
Treatment Taken	387 (58.45)	540 (53.94)
Treatment completed	246 (63.56)	370 (68.51)
Follow up attended	195 (50.38)	300 (81.08)

\*DPI: Default after preliminary investigations



**Figure 2. Map of Uttar Pradesh**

ultimately completed the prescribed treatment. 300/370 (81.08%) patients had attended post treatment follow-up at the Radiotherapy OPD at the time of analysis. Among 847 males, 662 (78.15%) could be planned for treatment after they had undergone the staging investigations as advised to them. Though 387/662 (58.45%) started the treatment process, only 246/387 (63.56%) completed the planned treatment. 195/246 (50.38%) patients had attended post treatment follow up at the time of analysis (Table 4).

## Discussion

As no proper cancer registry exists in the state of UP; the present study was carried out with an aim to describe the magnitude of cancer, stage or status of first presentation, compliance to treatment and follow up among patients to establish a role model for future guidance so that a proper hospital based registry can be set up and maintained.

A total of 4484 patients were registered in the department of Radiotherapy, IMS, BHU during the period of January 2005- December 2006. One hundred seventy-five patients registered in a single unit in the above period were subjected to retrospective analysis.

Most of the patients belonged to various districts of UP (66%), followed by neighbouring states like Bihar (27%). We register a few patients from our neighbouring country Nepal as well (Figure 2). Females out-numbered males (F:M=1.33:1). This is in conformity with the results of registered cases in Bangalore, Mumbai, Chennai and Barshi; rural and expanded where females predominate in the number of incident cases. (PBCR, 2009-2011). The estimates of cancer cases for all sites predicted for Indian males are 497,081 and 534,353 for the years 2015 and 2020, while the same for females are 563,808 and 614,404 respectively (Takiar et al., 2010); indicating a higher incidence in females. A recent report by Hussein et al (Hussein et al., 2013) reporting the patterns and trends of cancer in Odisha reported a higher proportion of cases in females. Out of 1128 females, 604 (53.54%) patients belonged to the 4-5<sup>th</sup> decade of life, whilst males [n=418 (49.35%)] belonged to a decade older (5-6<sup>th</sup>). Data from the three year report of PBCR (2009-2011) reveal that, after 45 years of age, the average annual age

specific incidence rates increase in males; whereas in females, the increase was observed after 30 years of age. Cancer incidences in rural Delhi (Manoharan et al, 2011) report the age adjusted incidence rates for all cancer sites to be 55.2 per 100,000 for males and 47.7 per 100,000 for females. According to SEER statistics, 1975-2010 ([http://seer.cancer.gov/csr/1975\\_2010/results\\_merged/topic\\_annualrates.pdf](http://seer.cancer.gov/csr/1975_2010/results_merged/topic_annualrates.pdf)); maximum incidence occurs from 5-8<sup>th</sup> decade, this is because life expectancy is more in developed countries.

Cancer of the Cervix was the leading cancer (43.88%) in the females followed by breast (15.15%), H&N (7.44%), GB (7.26%), and others. Cancer of the genitalia (49%) formed the leading cancer site in the fairer sex as cervical, ovarian, and endometrial cancers were among the top ten. Ca GB has been found to be high in these regions (7.26%). In males carcinoma of the H&N region formed the main bulk of cancers (about 35%) followed by brain, bone, soft tissue, lung, NHL and others. Ca GB forms a significant number in males as well in this region.

Patients coming for consultation in the department of Radiotherapy mainly hail from a rural background with a low socioeconomic status. The females are mostly illiterate, with early age of marriage, high parity and poor personal hygiene. These factors may be the reason for carcinoma cervix accounting for 44% of total cancers. The data from the PBCRs (2009-2011) and HBCRs (2006-2008) reveal breast cancer to be the most common cancer in females followed by cervix except Barshi where cancer cervix still remains the predominant reported malignancy. Cervix uteri continue to remain the leading site of cancer in both Barshi Rural registry (29.8%) and in Barshi Expanded (33.6%) registry as well (PBCR, 2009-2011) followed by breast and ovary. Manoharan et al. (2010) and Mehrotra et al. (2008) have reported cervix to be the leading malignancy in females in Allahabad and rural Delhi which show that cervical cancers continue to predominate in this part of the country in contrast to reported registries from other parts of the nation. Data from a rural district in South India (Swaminathan et al., 2009) also reveal cervical malignancy to be the leading cancer site in females. Takiar et al. (2011) have reported changes in cancer pattern in women in India for the time period of 1988-2005; they report a rise in the number of cases over these years and leading cancers being breast (34.3%), ovary (9.0%), gall bladder (8.8%), cervix (6.2%) and corpus uteri (5.8%) in Delhi. In case of Bhopal the maximum contributions are of breast (31%); cervix (12.7%), ovary (8.4%) and gall bladder (6.0%). NHL and brain tumours feature in top ten incident cancers in most of the registries. A look into the western world unveil breast(29%) to be the reigning cancer site in females followed by lung and bronchus and colorectum. The liver and intrahepatic malignancies are on the rise in the fairer sex and ovary features lower down in the order of top ten malignancies. (Siegel et al., 2013)

Addiction to tobacco chewing (paan, gutka, khaini) and smoking is very common among the population in this region which may be the cause of higher incidence of H&N cancers in both sexes. They form the major bulk of cancers in males (35%). Manoharan et al. (2010) and



Mehrotra et al. (2008) have reported oral cavity cancers to be the ruling cancer site in males in Allahabad and rural Delhi whereas lung continues to be the leading cancer site in almost all other registries. Hypopharyngeal and nasopharyngeal cancers do feature consistently in the list of top ten cancers of the north eastern region. Barshi rural and expanded registry, which predominantly has a rural population base, also shows cancer of the mouth to be the leading cancer. Carcinoma lung remains the dominating malignancy among all sites in the registries of metropolitan cities like Delhi, Bangalore and Chennai though surprisingly mouth cancers predominate in Mumbai. Data from the western world unwrap prostate to be the leading site followed by lung and bronchus and colorectum. Oropharyngeal cancers do feature in their list of top ten though they are placed lower down the order.

Stage was known for only 52% of cases, for the rest information regarding stage was not available; these patients had received primary treatment elsewhere and the records of treatment details were either not available or patient had not been staged before therapeutic intervention. Most of the cases presented in advanced stage of disease, with stage III & IV accounting for about 75% of cases. Analysis of 2167 H&N cases from a regional cancer centre done in Delhi (Mohanti et al., 2007) revealed about 80% of cases presenting with advanced stage of disease and about 10% cases were unstaged. The HBCRs (2004-2006) gave us a picture of the number and relative proportion of patients in various clinical extent of disease presentation at the time of registration at the reporting institution. The proportion of the patients with localised disease varied from 6.2% in males in Chennai to 10% in Mumbai. Similarly the percentage in females was 6.7% in Chennai to 13% in Mumbai. Percentage of patients reporting with locoregional disease varies from 60-80% in the registries of Chennai, Bangalore and Thiruvananthapuram. Mumbai has a somewhat lower incidence of advanced disease to the tune of 40%. A retrospective analysis of 15968 cancer patients done in Haryana over a period of 20 years showed only 3.55% of all cancer patients presenting with stage-I disease whereas 48.45% of all cancer cases had stage-IV disease at the time of their initial reporting to the hospital.

The reason for late presentation could be attributed to illiteracy and lack of awareness about the dreaded nature of the disease. Patients concealed their disease for a considerable period, especially females due to shyness. Financial constraints and transportation difficulties made it difficult for poor patients to travel distant places to seek medical advice at an early stage; the symptoms of advanced disease, forced them to pursue it later. Some cancers might not have produced discernible symptoms forcing consultation at the early stage. Local medical practitioners failed to arrive at the diagnosis for those presenting with early disease. Lack of workable clinical knowledge in the field of oncology and modern diagnostic tools of the practitioners in the vicinity led to improper diagnosis and delay in the proper management of cases.

About 82% of cases had cytology or histology based diagnosis; of which 79% were carcinoma. Squamous Cell Carcinoma was the most common histological subtype (56%) followed by adeno carcinoma (17%). Data from

the HBCRs (2004-2006) unveil that the proportion of microscopic confirmation was 90% in both sexes in all HBCRs, except in Chennai where it was 83.2% in males and 88.3% in females. Primary histology was the predominant form of microscopic diagnosis in all registries in both sexes. The percentage of diagnoses based on cytology was highest in Bangalore with 28.1% in males and 15.8% in females respectively. Dibrugarh (14.5%) had a high proportion of cases based on cytology in males. Again about 70-90% was SCCs across all the registries in both sexes. Clinico-pathological features of Gynecological Malignancies (Sarkar et al., 2013) reported from a tertiary Care Hospital in eastern India disclosed that majority of the patients (61.0%) had SCC, followed by adenocarcinoma (30.1%). About 95% patients with cervical malignancy had SCC, whereas ovarian tumors more commonly had a diagnosis of adenocarcinoma (88.9%). An epidemiological study of H&N malignancies done in Bihar (Siddiqui et al., 2013) reported SCC and its subtypes contributing to about 96% of all cases in both males and females.

Most of the cases [n=1254 (63.49%)] at first presentation were fresh cases; rest 721 (36.51%) patients had received some form of therapy elsewhere before they came for treatment at our centre. On comparison with the data from HBCRs (2004-2006) it was found across all registries in both the sexes that about 10-30% of cases had received prior treatment before their first presentation at the reporting institution.

Majority of the patients were planned for external beam radiotherapy either with a curative or palliative intent or for chemo-radiotherapy as they presented with advanced stage of disease. Thus, radiotherapy either as a single modality or in combination with chemotherapy was the most common modality of treatment used. Above findings are in conformity with HBCRs (2004-2006); most of the patients had been treated with single modality treatment which ranged from 60% in most registries in males to about 80% in Dibrugarh registry. Radiotherapy was the predominant modality employed being 74.1% in Dibrugarh registry among males; to about 20-30% in both sexes in Bangalore and Thiruvananthapuram registry. Chemotherapy used as a single modality for treatment of malignancy has gained popularity over the years across all registries and contributes to about 20% as a therapeutic or palliative intervention. Analysis of 2167 H&N cancer cases (Mohanti et al., 2007) showed major cancer-directed treatment decisions were for radiotherapy followed by surgery and radiotherapy, and chemo-irradiation in 68.2%, 16.9% and 9.1%, respectively.

A significant proportion of cases (12% in females and 22% in males) defaulted after undergoing preliminary investigations. Out of 88% of females and 78% of males planned for treatment, only 53.94% in females and 58.45% in males took treatment; of which only 68% and 63% in females and males respectively completed the prescribed treatment. On comparison with HBCRs we find no cancer directed treatment in males to be 48% in Mumbai, 45% in Bangalore and 56% in Chennai and only about 11% in Dibrugarh. The figures in females were about 43% in Mumbai, 30% in Bangalore and 45% in Chennai and

only 13% in Dibrugarh. This is because the percentages of patients taking treatment in the reporting institution at Dibrugarh were as high as 80-85% which varied from 30-40% only in both sexes across all other registries. Mohanti et al in his analysis of H&N cancer cases reported 56% compliance to treatment at his centre. Our study thus shows similar pattern of patient percentage taking prescribed treatment and similar figures of withdrawal after first visit to the hospital.

Compliance to follow up was poor; being 81% in females and 50% in males among those who completed the prescribed treatment. Review of literature suggests similar figures. Audit of cancer cases done by Das (2005) in Haryana over a period of 21 years revealed that in spite of best efforts approximately 73% of all patients who had received some kind of treatment were lost to follow-up within one year of completion of treatment. Sixty percent of patients with early stage disease who had complete response did not turn up for follow-up even for two complete years. Five percent of all patients who had received some form of treatment had 5 years of follow-up and only 0.2% of these patients had more than 10 years follow-up. Study done in Kidwai Institute of Oncology, (2006) revealed registration of about 16,000 new cases, of which 8,000 cases were diagnosed with cancer annually and, of which 1,500-2,000 were gynaecologic cancers. More than 50% were compliant to treatment, less than 30% defaulted during the adjuvant therapy and 20% defaulted after the preliminary investigations. Overall it was seen, 30% completed follow-up for three years in regional cancer centers. A study was done in a major cancer hospital in South India evaluating factors associated with loss to follow up or drop outs in cervical cancer patients (Paul et al., 2013). 784 patients were included in the study; of which 12% did not complete the initially planned treatment; among those completed; 34% were lost to follow up. This study also looked into the factors associated with poor follow up in a country like ours. Lack of awareness and education, long distance from the treating institution, financial constraints are some of the factors enumerated which are pertinent to this part of the nation as well.

In summary and conclusion, this retrospective analysis was undertaken to enumerate the demographic variables of malignant cases reporting to a university based hospital in the eastern part of the country. Most of the patients came from poor socio-economic strata, distant villages where there are poor medical facilities in the vicinity. Patients thus came in advanced stage of disease. Significant number of patients defaulted after preliminary investigations and compliance to treatment/follow up was poor. This study suggests that the following strategies should be effectively incorporated in cancer management programme for eastern UP. *i)* Cancer education programme should be more extensive in rural population; *ii)* Early detection centres and primary health care at rural area should be effective; *iii)* More expertise and treatment facilities should be available in rural set-up to reduce the agony and suffering of the rural population, especially female population; *iv)* Proper counselling is required to increase the compliance to treatment and

follow up; and *v)* Government aided treatment should be provided for the poor patients.

## References

- Ansari M, Mehdi G, Arif SH, Ansari H, Khan T (2012). Smear patterns and spectrum of premalignant and malignant cervical epithelial lesions in postmenopausal Indian women: a hospital-based study. *Diagn Cytopathol*, **40**, 976-83.
- Das BP (2005). Cancer pattern in haryana: twenty-one years experience (a retrospective analysis of 15968 patients). *Health Administrator*, **1052**, 29-49.
- Hussain MA, Pati S, Swain S, et al (2012). Pattern and trends of cancer in Odisha, India: a retrospective study. *Asian Pac J Cancer Prev*, **13**, 6333-6.
- Jemal A, Bray F, Center MM, et al (2011). Global cancer statistics. *CA Cancer J Clin*, **61**, 69-90.
- Manoharan N, Tyagi BB, Raina V (2010). Cancer incidences in rural Delhi, 2004-2005. *Asian Pac J Cancer Prev*, **11**, 73-7.
- Mehrotra R, Pandya S, Singhla M, Srivastava D, Singh M (2008). Spectrum of malignancies in Allahabad, North India: a hospital-based study. *Asian Pac J Cancer Prev*, **9**, 525-8.
- Mohanti BK, Nachiappan P, Pandey RM, et al (2007). Analysis of 2167 head and neck cancer patients' management, treatment compliance and outcomes from a regional cancer centre, Delhi, India. *J Laryngol Otol*, **121**, 49-56.
- Paul M, George PS, Mathew A (2012). Patient and disease related factors associated with lost-to follow-up/drop-outs of cervical cancer patients: a study at a major cancer hospital in South India. *Asian Pac J Cancer Prev*, **11**, 1529-34.
- Sarkar M, Konar H, Raut D (2013). Clinico-pathological features of gynecological malignancies in a tertiary care hospital in Eastern India: importance of strengthening primary health care in prevention and early detection. *Asian Pac J Cancer Prev*, **14**, 3541-7.
- Siddiqui MS, Chandra R, Aziz A, Suman S (2012). Epidemiology and histopathological spectrum of head and neck cancers in Bihar, a state of Eastern India. *Asian Pac J Cancer Prev*, **13**, 3949-53.
- Siegel R, Naishadham D, Jemal A (2013). Cancer Statistics, 2013. *Ca Cancer J Clin*, **63**, 11-3.
- Swaminathan R, Selvakumaran R, Esmey PO, et al (2009). Cancer pattern and survival in a rural district in South India. *Cancer Epidemiol*, **33**, 325-31.
- Takiar R, Nadayil D, Nandakumar A (2010). Projections of number of cancer cases in India (2010-2020) by cancer groups. *Asian Pac J Cancer Prev*, **11**, 1045-9.
- Takiar R, Vijay CR (2011). An alternative approach to study the changes in the cancer pattern of women in India (1988-2005). *Asian Pac J Cancer Prev*, **11**, 1253-6.
- Verma Y, Pradhan PK, Gurung N, et al (2012). Population-based cancer incidence in Sikkim, India: report on ethnic variation. *Br J Cancer*, **106**, 962-5.