An Epidemological Study of Cancer in five Districts of Andhra Paradesh, India

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ABSTRACT

The present epidemiological survey was performed in Hyderabad, Ranga Reddy, Kurnool, Nalgonda, Mahabubnagar and Adilabad districts. Out of 1720 risk prone cancer subjects, 1500 subjects were reported with various types of cancer incidence. The percentage of human subjects that were recruited with cancer incidence was 55.56 ± 13.89, 18.73 ± 0.49, 11.20 ± 3.40, 8.61 ± 4.41 and 5.60 ± 5.57 from Hyderabad, Ranga Reddy, Kurnool, Nalgonda, Mahabubnagar and Adilabad districts of Andhra Pradesh respectively as against to 3.70 ± 1.13 percentage in control subjects. The overall data on incidence of cancers among the population was subjected to statistical analyses by using Chi square test. The values are found to be significant at the level of $P < 0.01$ and 0.05.

KEY WORDS: Incidence, epidemiologic survey, cancer, chi square test.

1. INTRODUCTION

Cancer occurs in all climates and in all races, but its incidence and distribution varies from country to country and within country. The environmental factors and racial susceptibility are the responsible for their type of variations. Earlier several authors were estimated the incidence of cancer in India on the basis of mortality data (Khanolkar and Suryabai, 1945; Mitra and Das Gupta, 1960). The Chronic diseases such as Cancer and other non- communicable diseases are fast replacing to that of communicable diseases in India and other developing countries (Murthy and Aleyamma Mathew, 2004*).* The Cancer epidemiology focus mainly on the causes of cancer in the population. Since cancer is believed to occur over many months or even years, understanding its causes can be complex. Often times, the cancer epidemiologist uses a 'case-control' approach to study the disease, in which, people with and without a particular cancer are identified. Interviews are usually conducted and typically focus on individual health histories and habits. Sometimes medical records are also studied to investigate the pattern of the disease. The groups with and without cancer are then compared and researchers look for patterns or trends. The information from the cancer patients will help the researchers in assessing the public health requirements and the impact of control measures. The research in developing countries on the association between physical activity and cancer can provide valuable information on the magnitudes and types of activities that can protect people from cancer. If the cell is unable to repair the damage before the cell division, the mutation is fixed in. In this sense, the stage of initiation is irreversible and exhibits an infinite number of cells that may be initiated (Pozo and Diaz, 2003). Mutations induced in somatic cells may lead to the development of secondary tumors from the cells that are not originally neoplastic and the mutations induced in germ cells may be transmitted to the pregnancy and pose a genetic hazard to future generations (Fortune and Osheroff, 2000; Li and Liu, 2001; Wilstermann and Osheroff, 2003). The present epidemiological survey was performed in Hyderabad, Ranga Reddy, Kurnool, Nalgonda, Mahabubnagar and Adilabad districts.

2. MATERIALS AND METHODS

The inclusion criteria adopted for recruitment of the cases is that the patients lived in the particular area for a minimum period of a year at the time of 1st diagnosis of cancers. The data obtained by visiting to the hospitals, door to door and from diagnostic labs in the defined areas to obtain the required information from cancer patients in a standard format over a period of two years (Table.1). The survey was done by adopting a user friendly proforma proposed by ICMR to obtain the data on health status and prevalence of the diseases among the populations. The information was collected by direct interaction with the patient or the relations visiting the hospitals (As listed in table.1) and the obtained data was further cross checked with the hospital records of the specific patients in these areas to ascertain the authenticity. The adopted questionnaire includes general history (name, age, sex, religion), occupational information (nature of the work, duration of service, number of working hours), personal history (marital status, age of wife, consanguinity), reproductive history (number of live children, abortions, still births, neonatal deaths, congenital defects) and medical history (occurrence of chronic diseases, recent medication information, exposure to X–rays etc.) as well as past history of patient, clinical record, biomedical test record and treatment recommended. In this study 1720 risk prone human subjects were randomly selected from five zones of Andhra Pradesh during 2005-2006 and 2006-2007. All the selected subjects were given an informed written consent by informing the objective of the study. The subjects selected for this study falls in the mean age group of 25-65 years and belong to the same socio-economic status. 1500 cancer patients are recruited out of 1720, who were confirmed with cancers through medical reports (verified with Hospital records). Similarly 1000 age, sex matched human subjects not having any medical history has been selected as controls for comparison. The data was analyzed for statistical significance by using 2x2 contingency tests.

Table.1. Cancer Hospitals visited during the Epidemiological survey for the data

Name of the Hospital	Area located
MNJ Cancer Hospital	Saifabad (ICMR registered)
Apollo Cancer Hospital	Banjara hills (ICMR registered)
Indo American Cancer Hospital	Banjara hills (ICMR registered)
Bibi general Hospital and Cancer Center	Saidabad
C.C.R.C Cancer Clinic and Research Institute	Musheerabad
Yashoda Multispeciality Hospital	Secunderabad
Kamineni Multispeciality Hospital	L.B nagar
Pathological laboratories	Himayatnagar
Global Hospitals	Lakadika pool
Dr. S.V.S .S Prasad Hospital	Jubilee hills
Axon Medical Centre	Ameerpet
Government Medical Hospital	Kurnool (ICMR registered)
Government Medical Hospital	Mahabubnagar
Government Medical Hospital	Nalgonda
Government Medical Hospital	Adilabad

3. RESULTS AND DISCUSSION

The Cancer epidemiology was performed among 1720 human subjects from 5 regions (Hyderabad, Ranga Reddy, Kurnool, Nalgonda, Mahabubnagar and Adilabad districts) of Andhra Pradesh, India during 2 years of study period. The sample size and the subjects recruited for this epidemiological study was presented in table.2. The cumulative data on sample size and subjects recruited was presented in table.3, which reveals that the targeted 1720 human subjects were prone for cancer risk. The % of human subjects prone towards the risk are 53.04 ±13.89, 17.44±1.06, 11.62±2.47, 11.62±2.47 and 5.81±5.88 from Hyderabad, Ranga Reddy, Kurnool, Nalgonda, Mahabubnagar and Adilabad districts respectively as against to 10.40±0.58 percentage of human subjects in control population prone towards the risk. Out of 1720 risk prone cancer subjects, 1500 subjects were reported with various types of cancer incidence. The percentage of human subjects that were recruited with cancer incidence was 55.56±13.89, 18.73±0.49, 11.20±3.40, 8.61±4.41 and 5.60 ±5.57 from Hyderabad, Ranga Reddy, Kurnool, Nalgonda, Mahabubnagar and Adilabad districts of Andhra Pradesh respectively as against to 3.70±1.13 percentage in control subjects. Further the two years study data obtained during the two years of the survey was analyzed for independent period of study into 2005-2006 and 2006-2007. The cumulative sample size of the cancer patients during the study period of 2005-06 from Hyderabad, Ranga Reddy, Kurnool, Nalgonda, Mahabubnagar and Adilabad districts, was 92.26 ±0.72, 93.45±0.33,79.62± 0.75, 52.00± 1.67 and 75.00± 0.57 as against 3.70 ±1.13 in control group respectively.90.36±1.15, 93.78± 0.43, 86.61± 0.87, 68.42± 1.95 and 86.25 ± 0.61 percentage of cancer patients were recruited during 2006-07 from Hyderabad, Ranga Reddy, Kurnool, Nalgonda, Mahabubnagar and Adilabad districts respectively. The analyzed data was presented in table.3. The overall data on incidence of cancers among the population was subjected to statistical analyses by using Chi square test. The values are found to be significant at the level of P< 0.01 and 0.05.

The analyzed data reveals that statistically significant 64.73 ±8.30 percentage of cancer incidence reported among the male human subjects from Hyderabad, Ranga Reddy district followed by 17.91 ±0.38, 8.38 ± 2.16, 5.20 ±2.75 and 3.75 ±3.02 percentages of cancer incidences from Kurnool, Nalgonda, Mahaboobnagar and Adilabad districts (Table.3). Similarly 61.63±5.26 percentage of cancer incidences were reported among the females from Hyderabad and Ranga Reddy district followed by 23.89 ±0.49, 8.80±1.41, 4.40±1.97 and 1.25 ±2.37 percentage of incidences from Kurnool, Nalgonda, Mahabubnagar and Adilabad during 2005-2006 study period. More or less similar trend was reported during the subsequent year of study 54.31 ±8.34 percentages of cancer incidence are reported among the males from Hyderabad, Ranga Reddy district followed by 17.25 ±0.66, 11.67 ±2.02, 9.98 ±2.43 and 6.79 ±3.21percentage of incidences from Kurnool, Nalgonda, Mahabubnagar and Adilabad districts. Similarly 48.25±5.28 percentage of cancers reported among the females from Hyderabad and Ranga Reddy district and the percentage of incidence are followed from 19.55 ±0.08, 13.86 ±1.78, and 11.13±1.78, 7.17 ±2.58 from Kurnool, Nalgonda, Mahaboobnagar, and Adilabad during 2006-2007 study periods. The percentage of cumulative incidence of cancer cases from Hyderabad & Ranga Reddy district was 55.86±13.80 followed by 18.73±0.49, 11.20±3.4, 8.60±4.4, 5.60±5.57, from Kurnool, Nalgonda, Mahabubnagar, and Adilabad as compared to 3.70 percentages in control subjects. The values are analyzed for statistical significance by χ 2 test (Table.4) and the values are found to be significant.

Table.2. Sample size and subjects recruited for the study

Subjects	Controls	Hyderabad & Ranga Reddy	Kurnool	Nalgonda	Mahabubnagar	Adilabad	Total
No. of subjects	1000	920	300	200	200	100	1720
No.of subjects prone For risk	104 (10.40$\pm$0.58)	920 (53.40 $\pm$ 13.89)	300 (17.4 $\pm$1.06)	200 (11.62 $\pm$3.47)	200 (11.62$\pm$3.47)	100 (5.81 $\pm$5.88)	1720
No.of cancer incidence reported	37 (3.70$\pm$2.70)	838 (55.36 $\pm$13.89)	281 (18.73 $\pm$0.49)	168 (11.20 $\pm$3.40)	129 (8.61$\pm$4.41)	84 (5.6$\pm$5.57)	1500
Percentage $\pm$SD	3.70 $\pm$1.13	91.08$\pm$1.35	93.66$\pm$0.54	84.00$\pm$1.13	64.50$\pm$2.51	84.00 $\pm$0.80	87.20 $\pm$2.65

Values in parenthesis are percentage $\pm$S.D.

Table.3. Data on Cumulative incidences of Cancers Gender wise from five Districts of Andhra Pradesh

Region	2005-2006			2006-2007			Total (1+2)
	Male (%$\pm$S.D)	Female (%$\pm$S.D)	Total (1) (%$\pm$S.D)	Male (%$\pm$S.D)	Female (%$\pm$S.D)	Total (2) (%$\pm$S.D)	Total (3) (%$\pm$S.D)
Hyderabad & Ranga Reddy	224(64.73 $\pm$8.3)	98 61.63$\pm$5.26)	322(63.76 $\pm$9.84)	321(54.31 $\pm$8.34)	195(48.25 $\pm$5.28)	516(51.85$\pm$10.05)	838(55.86$\pm$13.8)
Kurnool	62(17.91 $\pm$0.38)	38(23.89 $\pm$0.493)	100(19.80 $\pm$0.493)	102(17.25 $\pm$0.66)	79(19.55 $\pm$0.08)	181(18.19 $\pm$0.57)	281(18.73$\pm$0.49)
Nalgonda	29(8.38$\pm$2.16)	14(8..80 $\pm$1.41)	43(8.51$\pm$2.58)	69(11.67 $\pm$2.02)	56(13.86$\pm$1.23)	125(12.56 $\pm$2.34)	168(11.20$\pm$3.40)
Mahboobnagar	18(5.20$\pm$2.75)	7(4.40$\pm$1.97)	25(4.95$\pm$3.38)	59(9.98$\pm$2.43)	45(11.43$\pm$1.78)	104(10.45 $\pm$3.01)	129(8.60 $\pm$4.40)
Adilabad	13(3.75$\pm$3.02)	2(1.25 $\pm$2.37)	15(2.97 $\pm$3.83)	40(6.79 $\pm$3.21)	29(7.17 $\pm$2.58)	69(6.93 $\pm$4.12)	84(5.60 $\pm$5.57)

Table.4. X^2-values for the incidences of cancer between control and Zones in male and female from 2005-2007

Controls vs. zones	X^2 valuesof males	X^2 values of females
Control V$_S$ Hyd. & R.R. Dist	0.50	8.00
Control V$_S$ Kurnool	0.33[*]	3.28
Control V$_S$Nalgonda	0.046	0.12[*]
Control V$_S$ Mahaboobnagar	9.21	0.16
Control V$_S$ Adilabad	0.05	1.51

*p<0.01

4. CONCLUSIONS

The percentage of cumulative incidence of cancer cases from Hyderabad & Ranga Reddy district was higher when compared to cancer incidences from Kurnool, Nalgonda, Mahabubnagar and Adilabad as compared to 3.70 percentages in control subjects.

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