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Cancer prevalence in south Indian hospitals: A prospective observational study

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Abstract
To evaluate the prevalence of different types of cancers in South Indian Hospitals among defined population. Cancer is uncontrolled growth of abnormal cells in the body triggered when body's normal control mechanism stops working. Almost 75-80% of patients have advanced stage of disease at the time of diagnosis. The study data was captured from Regional Hospitals among South Indian Population for a duration of 6 months. The results were evaluated from a statistical database. Breast Cancer is the major cause of morbidity and mortality when compared to other types of Cancer. Age groups of 50 – 58 years where at higher risk of Cancer. In constarst, age groups of 30-39 years and ≥ 60 years were at equal risk of Cancer.

Keywords: gender, lung cancer, breast cancer, genetical genomics, urban, semi-urban, risk factors

Introduction
Cancer is the uncontrolled growth of abnormal cells in the body. Cancer develops when the body's normal control mechanism stops working. Old cells do not die and instead grow out of control, forming new, abnormal cells. These extra cells may form a mass of tissue, called a tumor. Some cancers, such as leukemia, do not form tumors [1].

The increasing cancer burden is due to several factors, including population growth and senility as well as the changing prevalence of certain causes of cancer linked to social and economic development. This is particularly true in rapidly growing economies, where a shift is observed from cancers related to poverty and infections to cancers associated with lifestyles more typical of industrialized countries.

The global cancer burden is estimated to have risen to 18.1 million new cases and 9.6 million deaths in 2018.One in 5 men and one in 6 women worldwide develop cancer during their lifetime [2].

Cancer have high prevelance because of late diagnosis, almost 75-80 per cent of patients have advanced disease (Stage 3-4) at the time of diagnosis [3]. In India most of the cancers are due to the tobacco usage[4].According to Research of the Indian Council of Medical Research (ICMR) 2018 report, cancer of the lip and oral cavity showed a huge increase followed by breast cancer.

Most of the yester epidemiological studies have stated that tobacco smoking and alcohol drinking as the main risk factors for esophageal squamous-cell carcinoma or unspecified esophageal cancer [5]. In addition, Inadequate consumption of fruits and vegetables, betel nut chewing have also been reported under risk factors for esophageal cancer [5]. Esophageal and pancreatic/gastric cancer are the seventh and fifth most commonly diagnosed cancers worldwide [6]. Breast cancer was one of the emerging type of Cancer among women [7]. Generally Breast cancer is defined based upon its stratification into tow molecular sub types namely Hormonal receptors [HR] and Human epidermal growth factor receptor [HER2] [7].

Cigarette smoking and long standing type-II diabeties are two well-established risk factors. In addition, being overweight and obese plays a key role in the development of pancreatic cancer [8]. Survivin, a novel inhibitor of apoptosis, blocks common downstream elements of both the mitochondrial pathway and the death receptor pathway, by directly inhibiting terminal effector caspase-3, caspase-7 and caspase-9 activity, there by blocks mitrochondrial cytochrome c release into the cytosol, resulting in the inhibition of mitochondrial apoptotic pathway [9]. Survivin expression is significantly associated with poor clinical outcome in cancers, such as neuroblastoma, colorectal cancer, breast cancer, lung cancer and esophageal cancer [9]. Furosemide, a loop diuretic, acts on the thick ascending limb of the loop of Henle, where it can block the luminal Na-K-2Cl (NKCC) transporter, a protein that transports sodium, potassium and chloride between intracellular and extracellular fluid, triggering to change in ostomic pressure to increase the urine production [6]. Earlier evidence has evaluated that the NKCC plays an important role in cancer cell growth. It has been shown that over expression of the NKCC can induce cell proliferation, NKCC expression was three fold higher in poorly differentiated gastric adeno-carcinoma cells when compared to moderately differentiated. Although pre-clinical studies proved that furosemide could slow gastro-esophageal cancer progression, however no studies have been conducted to evaluate a potential association in human volunteers [4]. Furosemide usage was associated with slightly increased mortality in patients with esophageal and gastric cancer [6].

Methodology
To determine the prevalence of cancer derived from population based cancer registries which aim to record information on all the new cases of cancer occurring in a defined population and provide them with the information

regarding Cancer censes and its types in south India. We collected and reviewed data of the patients admitted in Chalmeda Anandrao Institute of Medical Sciences (CAIMS), Cancer Hospital and Research Institute and Care hospitals in the Karimnagar district and BBR Superspecilaity Hospital, Hyderabad of Telangana state for the period of 6 months. Only patients who were hospitalized were included in the study. Patient with cancers were identified by performing specific diagnostic tests like Biopsy mammogram, Fine-Needle Aspiration Cytology (FNAC). Information regarding demographics (age, sex, weight) diagnosis, family history, and all the relevant and necessary data is collected.
The data from all case sheets were reviewed in data base through which statistics were evaluated.

Materials and Methods

Study site
The present study was conducted at in-patient department in Chalmeda Anandrao Institute of Medical Science and Cancer Hospital and Research Institute, Karimnagar & BBR Superspecialty Hospital, Hyderabad, Telangana.

Study design
This is a prospective observational study.

Study period
This study was carried out for a period of six months.

Study criteria
Inclusion criteria: All the patients who were diagnosed with different cancers.
Exclusion criteria: Age above 18 and below 70 years.

Study population
Total 200 patient's data was collected.

Source of data
The data including demographics, diagnosis, Social Habits and all the other relevant and necessary data is collected from Patient's case sheet, Patient's interview. All the data was documented in a suitably designed data collection form developed for the study.

Discussion and Results

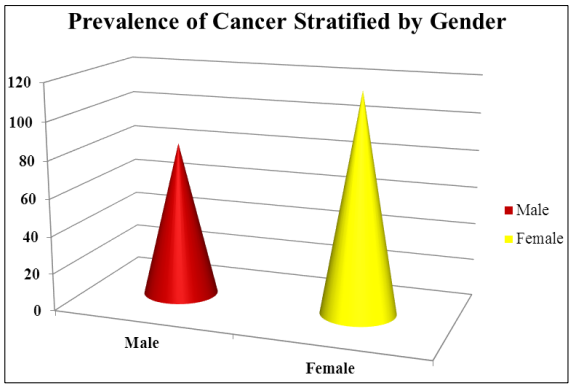

Fig 1

Gender differences in susceptibility to disease is very useful information that used to develop a casual Hypothesis for the disease. Not just cancer, but some other common diseases Also show some gender differential. It is important to Recognize and use it to gain insight into disease biology. In addition to a systematic exploration of the mechanisms underlying physiological differences between sexes using geneticalgenomics [10].
Gender plays a crucial role in the incidence, disease prognosis and mortality in a variety of cancers. Prostate, lung, and colorectal cancer occur the most in males, while breast, lung, and colorectal cancer are predominant in females. In our study we found that females are moresuseptable to few cancer [11]. Gene expression changes are the most common intermediate phenotype between genetic variants and modification of disease risk [12].
In cancer susceptibility, the role played by the environment is much greater than that of genetics or gender [13, 14]. Autoimmunity in which females have an overall higher susceptibility, but males are more susceptible for few of them [15].

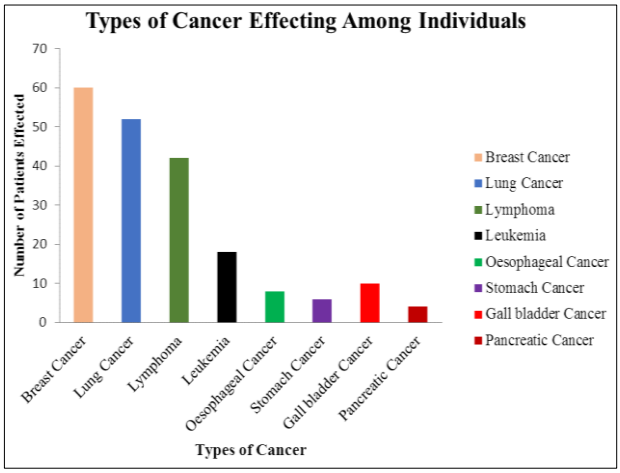

Fig 2

In our study, Among Total 200 subjects Breast cancer is most addressed type of cancer, followed by Lung Cancer and least was pancreatic cancer and other cancers like lymphoma, leukemia, oesophageal cancer, stomach cancer, gall bladder cancer as represented.

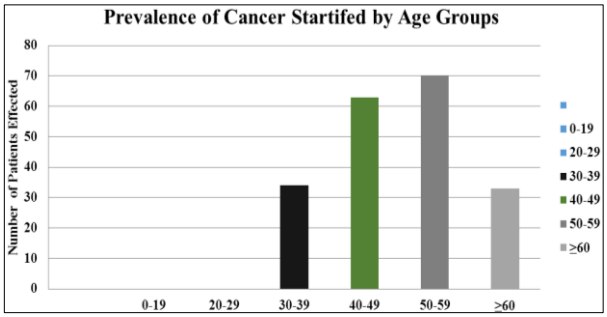

Fig 3

In present study, we found that the age group of 30 years and above were diagnoised with different types of cancers, on a whole age group of 50 to 59 years are associated with higher risk when compared to other senility groups considered in the study followed by age group of 40 to 49 years, where asminimal risk are marginally equal among age groups of 30 to 39 years and ≥60 years.

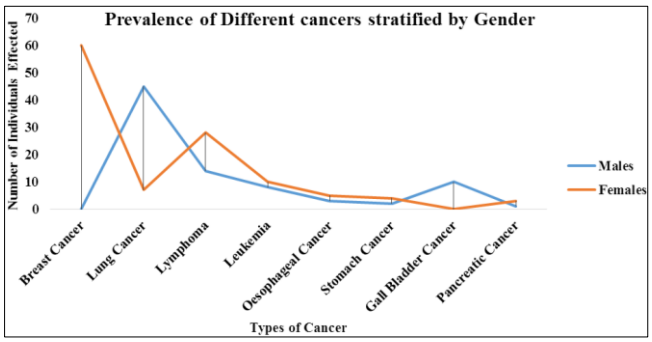

Fig 4

As it represented in Figure-4, on the whole 117 women and 83 men were effected with different types of cancers.

Women were more prone to different types of cancer when compared to men. In a plethora of cancers; breast cancer was more prevalent in females (34%) and least was pancreatic cancer, other cancers were lung cancer, lymphoma, leukamia, oesophagealcancer, stomach cancer.

Lung cancer was observed more in men (52.2%) than that of females (5.9%). Its about 12% men with Gall bladder cancer but none among females.

Oesophageal cancer, stomach cancer and pancreatic cancers are marginally higher in females than in male population. Prevalence of lymphoma was exactly double fold in men to that of females.

Breast Cancer

Breast cancer is a disease that occurs when cells in breast tissue change (or mutate) and keep reproducing. These abnormal cells usually cluster together to form a tumor. A tumor is cancerous (or malignant) when these abnormal cells invade other parts of the breast or when they spread (or metastasize) to other areas of the body through the bloodstream or lymphatic system, a network of vessels and nodes in the body that plays a role in fighting infection.

Breast cancer usually starts in the milk-producing glands of the breast (called lobules) or the tube-shaped ducts that carry milk from the lobules to the nipple. Less often, cancer begins in the fatty and fibrous connective tissue of the breast [16]. Due to illiteracy and lack of awareness on Breast cancer women are more prone to breast cancer.

Earlier cervical cancer was most common cancer in Indian woman but now the incidence of breast cancer has surpassed cervical cancer and is leading cause of cancer death, although cervical cancer still remains most common in rural India

Breast cancer is the major cause of morbidity and mortality among females ranking number one among females in Indian metropolitan cities [17].

According to the cancer incidence study conducted by Indian Council of Medical Research (ICMR) and Public Health Foundation of India (PHFI) between 1990 and 2016, which was published in 'The Lancet', in all the Indian States, nearly 59 to 60 persons for a one lakh population died to due to cancer in 2016.

'The Lancet' study says that number of cancer cases has doubled in the country between 1990 and 2016. The top ten cancers that contribute highest in terms of ailments are stomach, breast, lung, lip and oral cavity, pharynx other than naso-pharynx, colon and rectum, leukaemia, cervical, oesophageal, and brain and nervous system cancers [18].

Lung Cancer

Lung cancer is the most common cancer diagnosed worldwide. It is also the foremost contributor to cancer-related mortality, resulting in 1.38 million cancer deaths per year worldwide. It is also the major cause of death in india **[19].** In south India majorly lung cancers were reported due to social habits like cigarette, bidi smoking, chewing tobacco [20, 21].

According to the GLOBOCAN 2012 report, the estimated incidence of lung cancer in India was 70,275 in all ages and both sexes. There were 53,728 new lung cancer cases among Indian males (crude incidence rate - 8.3, ASR (W) - 11, and cumulative risk - 1.36).

Conclusion

In the present Study, we evaluated that cancer was more prevalent among Females than males. Breast Cancer was most common type of Cancer addressed among the population, in contrast Pancreatic Cancer was least prevalent type of cancer when compared to other types of cancers considered in the study.

In consideration of Senelity, age groups of above 30 years were at high risk of Cancer, age group of 50-59 years were at highest risk and whereas age groups of both 30 to 39 years and ≥60 years were equally effected among the included subjects.

In consideration of different types of cancers on a whole stratified by Gender, Males are at higher risk for lung cancer, Gall bladder than females, nevertheless females are at higher risk for other types included in the study namely Breast cancer, lymphoma, Leukamia, Oesphageal cancer, Stomach cancer and Pancreatic cancer.

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