



Demographic Profile of Adolescent and Young Adult Females with Cancer in Urban Ahmedabad Agglomeration area

KEYWORDS

Adolescent, Young adults, Cancer

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ABSTRACT *Background: Adolescents and young adults (AYA) are defined as those who are of the age group 15-39 years at the time of initial cancer diagnosis. There is an increase in incidence rate of cancer among adolescents and young adults. Lack of data for Indian adolescent and young adults with cancer led us to conduct this study.*

Objectives: To study the cancer incidence and mortality rates and distribution of various cancers within the young female population of 15-39 year olds in Urban Ahmadabad Agglomeration area.

Material and methods: An analytical study was done to study the cancer incidence and mortality rates and distribution of various cancers within the young female population of 15-39 years old in Urban Ahmadabad Agglomeration area for the year 2010. Cancer distribution and causes of cancer deaths were studied. Crude, Age specific and Age adjusted incidence and mortality rates were calculated using data on population size and its age structure for the corresponding year.

Results: Adolescent and young adult females accounted for 15.4% (n=266) cancer incidence and 13.4 % (n=59) cancer deaths in female population. Crude incidence and mortality rates were 24.36 and 5.4 per lac population respectively. Age specific cancer incidence and mortality rates by five year age groups were function of age and, ranged 6.4- 57.4 % and 1.6-12.2% respectively. The leading cancers in rank were breast, myeloid leukemia, brain and nervous system and cervix. Breast cancer was the leading cause of death followed by lymphoid leukemia and cancer esophagus.

Conclusion: There is a need to shift our focus on AYA population as it represents a significant number and is a distinct group. Breast and cervical cancers are among the leading cancers and their incidence can be brought down by increased awareness and effective preventive measures. Larger studies are suggested to further elucidate factors contributing to the cancer etiology and trends among adolescents and young adults in India.

Introduction:

Adolescents and young adults (AYA) are defined as those who are of the age group 15-39 years at the time of initial cancer diagnosis[1]. There is an increase in incidence rate of cancer among adolescents and young adults[2,3,4]. In the United States, cancer is the leading cause of death among adolescents and young adults excluding homicide, suicide and unintentional injury. There has been a lack of progress in survival improvement in adolescents and young adults relative to all other ages[3]. Additionally, there is evidence that a substantial proportion of the cancers in young adults have a different biology, and probably etiology/pathogenesis, than that of what appears to be the same cancer in younger or older persons[5]. Lack of data for Indian adolescent and young adults with cancer led us to conduct this study.

Material and methods: An analytical study was done to study the cancer incidence and mortality rates and distribution of various cancers within the young female population of 15-39 years old in Urban Ahmadabad Agglomeration area for the year 2010. Data was obtained from the Population based cancer registry, Ahmedabad Urban Agglomeration area- annual report 2010 prepared by Gujarat Cancer and Research Institute, Ahmedabad [6]. Institute's

ethical committee approval was taken for the study.

Inclusion criteria

- Adolescent and young adult females as defined by NCCN guidelines 2010 ie 15-39 years of age at the time of initial cancer diagnosis[1]
- Patients who have lived in the defined areas of Ahmedabad urban for a minimum period of one year at the time of first diagnosis of cancer
- Only invasive cancers are reported

Exclusion Criteria:**Benign tumours and in situ cancers**

Cancer distribution and causes of cancer deaths were studied. Crude, Age specific and Age adjusted incidence and mortality rates were calculated using data on population size for the corresponding year and age group.

Statistics: CIR = (C/N) X 100,000

CIR=Crude Incidence Rate

C=Total number of new cases registered during a year

N=Corresponding population of that year

$$ASpR = (C_i/N_i) \times 100,000$$

ASpR=Age specific rate

C_i = Number of new cases of a group registered during a year

N_i = Corresponding population of same age group of that year $\times 100,000$

$$A = \sum_{i=1}^A a_i w_i$$

$$AAR = \frac{\sum_{i=1}^A a_i w_i}{\sum_{i=1}^A w_i}$$

AAR=Age Adjusted/Standardized Rate

a_i = age specific rate of age class a_i

w_i = world standard population age class a_i

A is number of age class intervals

Results: Adolescent and young adult females accounted for 15.4% (n=266) cancer incidence and 13.4%(n=59) cancer deaths in female population. Crude incidence and mortality rates were 24.36 and 5.4 per lac population respectively population. Age adjusted cancer incidence rate was 22.9 per lac population and age adjusted cancer mortality rate was 5.1 per lac population.

Age specific cancer incidence and mortality rates by five year age groups are shown in Fig 1. Age specific cancer incidence rates were function of age and, ranged 6.4- 57.4 % and 1.6-12.2% respectively. Age specific cancer incidence and mortality rate were highest in 35-39 yrs age group. The mortality to incidence ratio is shown in Fig 2.

Cancer breast (34.2%) was the most common cancer. The other leading cancer in rank were myeloid leukemia, brain and nervous system, cervix, tongue and ovarian cancers. Breast cancer was the leading cause of death followed by lymphoid leukemia and cancer esophagus.

Fig 1 Age specific cancer incidence & mortality rates

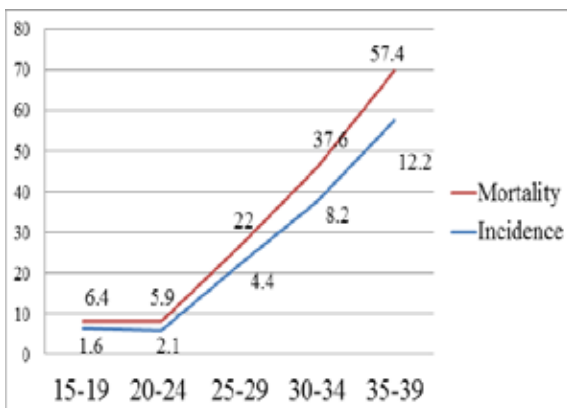
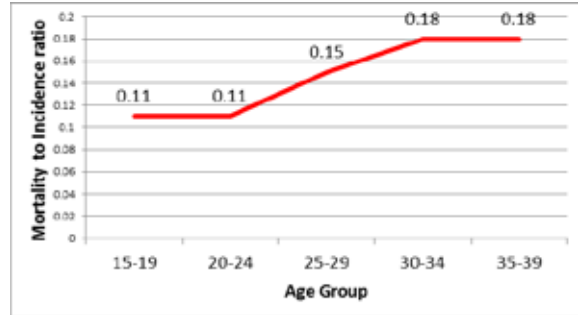


Fig 2: Mortality to Incidence ratio



Discussion:

It has been estimated that there are approximately 350,000 new cancer cases diagnosed annually in the age group of 15 to 29 years and an additional 650,000 cases in the age group of 30 to 39 years worldwide. Because the majority of these incident cases occur in low-income countries, a large proportion of actual cases are likely not diagnosed or those diagnosed may not receive adequate therapy [7].

The present study also shows that cancers in adolescent and young adult females represent a significant number. Moreover, a diagnosis of cancer during adolescence or young adulthood can have a major impact on future quality of life and life expectancy, as well as disrupting normal trajectories of development (e.g., physical, psychological and social) and life goals related to family and careers[5]. Therefore, there is a need to shift our focus on this group.

Cancers in adolescents and young adults represent a transition between the nonepithelial types, especially acute leukemias and embryonal tumours, that are common during childhood and the epithelial types (i.e., carcinomas) that account for most cancers in older adults[8]. Our study also supports these findings as breast cancer, cancer cervix as well as myeloid leukemia were reported in the study group.

Breast cancer is the leading cancer among Urban Ahmedabad as well as American AYA females. In USA, it accounts for 20.4% of all cancers in this age group[1]. On the other hand, breast cancer is responsible for 34.2% cancers among adolescent and young adult females of Urban Ahmedabad population. The high incidence of breast cancer could be linked to modern life style changes eg high intake of fatty diet, decreased physical activity and late marriages. Education regarding life style modifications, self breast examination and mammography can help detect the cancer at an early stage and decrease the mortalities due to this cancer as this cancer is amenable to early detection. Cancer cervix is among the topmost five cancers in both American and Urban Ahmedabad population. It is a preventable cancer as the pre-invasive disease can be detected through pap smear which is a very simple screening test. Increased awareness and effective implementation of preventive services can lead to a major impact on cervical cancer incidence and its cure rates among this young population.

The other leading cancers in USA are thyroid carcinoma, melanoma and Hodgkin's lymphoma[1]. These differences could be due to different race and ethnicity, geographical distribution and difference in habits eg. tobacco chewing leading to higher incidence of tongue cancer in our study[9]. It is important to determine all the age specific

and local factors to address the issues pertaining to the adolescent and young adults.

The age specific incidence rates were a function of age which suggests role of biologic mechanism that are function of age such as telomerase shortening or mutation to malignancy rate that increases constantly with age[3].

Higher age groups had higher age specific mortality rates as well as a higher mortality to incidence ratios. Cancers in adolescents and young adults may have biologically distinct behaviours, and the same cancers in different age groups may respond differently to treatment[5]. Another reason for the higher mortality rates in the higher age groups could be due to ignorance of symptoms due to focus on the career and greater family responsibilities at these stages of life. There is a need to further identify and address other factors.

Conclusion: There is a need to shift our focus on AYA population as it represents a significant number and is a distinct group. Breast and cervical cancers are among the leading cancers and their incidence can be brought down by increased awareness and effective preventive measures. Larger studies are suggested to further elucidate factors contributing to the cancer etiology and trends among adolescents and young adults in India.

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