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Original Research Article

Mortality profile in pediatric malignancies: a 11 year retrospective study

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ABSTRACT

Background: Malignancy is one of the leading causes of childhood deaths in developed nations while diarrheal and respiratory infections continue to compete in many developing nations. Since the state of Goa, has health statistics comparable to the western world, an attempt has been made to look at the childhood cancer mortality in proportion to overall deaths in the only tertiary care hospital in the state

Methods: In the absence of a population registry, information was obtained from the hospital mortality statistics during the period from January 2007 to December 2017.

Results: A total of 118 cancer deaths were seen over a period of 11 years with a male/female ratio of 1.34:1. The proportion of cancer deaths to total deaths due to any cause, per year was 11.9%. Most of the deaths were noted in the 1-10 years age group (53.4%) with maximum deaths seen in hematological malignancies (50.8%).Though sepsis was the immediate cause of death in 42(35.6%), a significant drop was noted in last 5 years wherein it was observed to fall from 22.8% in the initial 6 years to 12.7% in the latter 5 year period.

Conclusions: Proportion of cancer related deaths were seen to reduce over the study period with a significant drop, in sepsis, as the major cause. Simple measures to control sepsis may help to reduce cancer mortality.

Keywords: Childhood cancers, Febrile neutropenia, Mortality, Sepsis

INTRODUCTION

The overall incidence of pediatric cancers in India between 2012-2014 was estimated as 0.7-4.4% which was is slightly lower than previous reported proportion of 0.5%-5.8% of childhood cancers for the year 2006-2011.[1] Though outcomes have improved in different cancers with modern research, significant mortality is still associated with various childhood cancers. In India, cancer is the 9th common cause for the deaths in children between 5-14 years of age. [2]

In the absence of good quality, population based registries, there is paucity of data on true cancer burden as well as mortality in cancer in developed countries. Despite a higher burden, cancer mortality still continues to be lower than other competing illnesses like diarrhea and respiratory infections. The state of Goa, having higher health standards as compared to other states in India, this study attempts to find out profile of cancer mortality in pediatric cancer patients in the only tertiary care hospital in the state.

METHODS

This was a retrospective cohort study. The study setting was an apex tertiary care hospital run by the state government in a developing country. The study period

was a 11-year period from January 2007 to December 2017. The study population was all children between 0-18 years of age, with a confirmed diagnosis of cancer who expired during the study period.

Inclusion criteria

- Children less than 18 years of age who expired during the study period.
- Those with a confirmed diagnosis of cancer by means of cytological or histological examination except in those with brain tumors inaccessible for histological diagnosis.

Exclusion criteria

- Those above 18 years of age.
- Children in whom cause of death was not attributed to malignancy.

Information about children who fulfilled the inclusion exclusion criteria was obtained from the hospital death records maintained by the medical records department of the institute, in the absence of a state population registry. Data regarding demographic details, type of malignancy, immediate cause of death, presence of febrile neutropenia, etc. was noted in a predesigned proforma. Total number of deaths in the age group of 0-18 years due to any cause per year during the said period of 11 years were also recorded and proportion of cancer deaths to total deaths per year was calculated.

Statistical analysis

Data was entered on an excel sheet and analysed by sorting and results were expressed in terms of percentages and proportions.

RESULTS

A total of 118 cancer deaths were noted during the study period of 11 years while total deaths due to any cause in the 0-18 years age group were 990 (Figure 1).

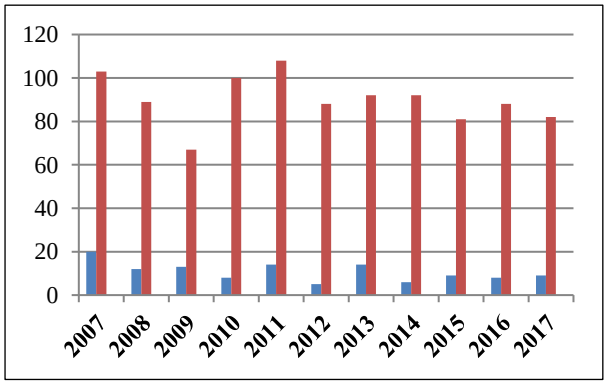

Figure 1: Year wise number of cancer deaths v/s total deaths.

The proportion of cancer deaths to total deaths per year over the 11 year study period was 11.9%.

The male to female ratio was 1.34:1. (67:50).

Most of the deaths were noted in the age group of 1-10 years 53.4% (63) while 13.6% (16) in <1 yr and 33% (30) in above 10 yrs age group. Amongst these, majority were in the age group of 5 years and below (42.4%). 30 patients (25.4%) expired within 48 hrs of hospital admission while 88(74.5%) had a duration of hospital stay of more than 48 hrs prior to death.

Out of the total 118 deaths during the study period 60 patients (50.8%) had Hematological malignancies of which 51 had acute Leukaemia and 9 had Lymphomas . 38 patients (32.2%) had Solid tumours: (Neuroblastoma-11, PNET-4, Osteosarcomas-6, Germ cell tumour- 3, Hepatoblastoma-2, Rhabdomyosarcoma-2, Wilms tumour-2 and 1 each of Retinoblastoma, Langerhans cell histiocytosis, Ovarian carcinoma, Nasopharyngeal carcinoma, Sacrococcygeal teratoma, Ewings sarcoma, Pleuropulmonary blastoma, Malignant round cell tumour) and 20 (16.9%) had CNS tumours (Medulloblastoma-5, Brain stem gliomas-4, choroid plexus carcinomas-3, astrocytomas-2 and 1 each of Pineal gland germinoma, Ependymoma, Ependymo blastoma, Mixed glioma of cerebellum, Embryonal tumor of brain, Glioblastoma multiforme.) (Figure 2).

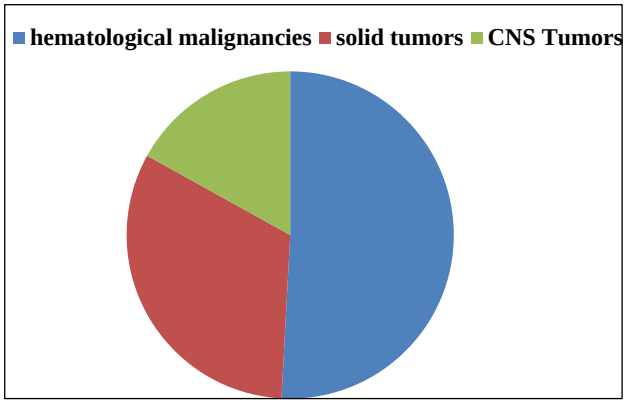

Figure 2: Distribution of deaths according to type of malignancy.

The cause of death was sepsis in 42(35.6%) patients of which 23(54.7%) children had respiratory infections. There were 47(39.8%) deaths associated with the primary malignancy itself, of which 10(21%) patients died of Intracranial bleeds. Febrile neutropenia was present in 21(17.8%) patients. Metastasis from primary malignancy was seen in 12(10%) patients (Figure 3).

In the initial 6 years infection related deaths were almost 22.8% (27 deaths), while in the last 5 years it dropped to 12.7% (15 deaths) (Figure 4).

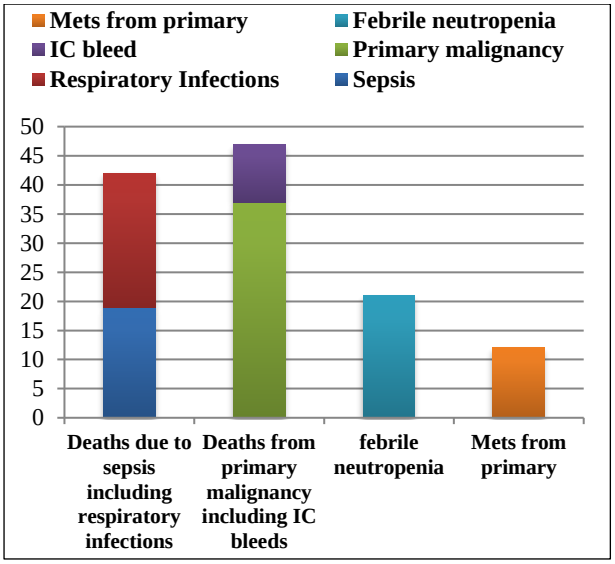

Figure 3: Distribution of deaths according to cause.

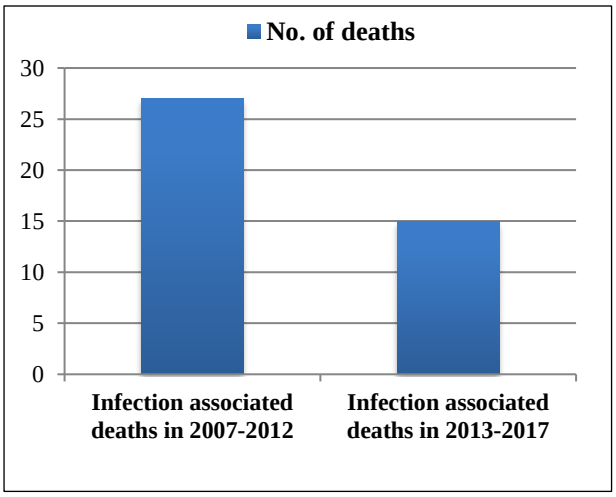

Figure 4: Declining trend of infection associated deaths in last 5 yrs of study period.

DISCUSSION

As per this study 118 cancer related deaths were reported during the 11 year period contributing to 11.9% of total pediatric deaths with a slight male preponderance of 1.34:1. Similar finding was noted by Sumit Gupta and et al, wherein they reported a mortality rate of 37/million population per year with a preponderance of male deaths(1.6:1).[3]

Majority of the deaths were seen in the age group of 5 years and below (42.4%) and 50.8% had hematological malignancies. This may be due to the known fact that hematological cancers are the commonest and 1-5 years being the age group that is usually affected. Similarly, P Kusumakumari et al, in their study on profile of pediatric malignancies: A 10-year study; has reported that in general, the malignancies were more in males and 46% of all cancers were seen in children below 5 years of age.[4]

Sepsis was seen as a common cause of death in the first six years of our study period, while a significant reduction was seen in next five years. Simple measures taken such as, making a separate enclosed cubicle within the general ward for admissions of cancer patients, use of face masks, strict handwashing, preparation and administration of chemotherapy drugs under strict asepsis and having a designated team to manage these patients may have contributed to this reduction. Similarly, infection was observed as an immediate cause of death in a study by Brown BJ et al, also.[5]

Significantly decreasing mortality rates in cancer were seen in developed countries over the years as a result of major advances in treatment but not much improvement has been realized in lower income countries. In the present study author observed that the proportion of cancer deaths to total deaths has not changed much over the years though the causes may have changed.

Authors also noted that active disease as the cause of death was seen in only 39.8% of this cases while R H Al Asir et al, reported active disease as the cause of death in 84% cases in their earlier studies, indicating better treatment modalities over the years which may have contributed to this decline.[6]

CONCLUSION

This study revealed a decrease in infection related deaths over the last 5 years most probably secondary to improved sepsis control measures.

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