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"Prevalence and Identificationof Socio-Demographic Factors and Patterns of Childhood Cancer: A Study in a Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh"

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Abstract:
Introduction: *Cancer is a2nd leading cause of death for children and adolescents around the world and approximately 300,000 children aged 0 to 19 years old are diagnosed with cancer each year.[i]Bangladesh currently has more than 1.5 million cancer patients. According World Health Organization (WHO), there were a little 150,781 new cancer cases in Bangladesh last year[ii]Childhood cancer is increasing day by day. Approximately 84 % of the cancer cases fewer than 15 years occur in the low-income and middle-income countries (LMICs).[iii]The reasons for lower survival rates in LMICs include an inability to obtain an accurate diagnosis, inaccessible therapy, abandonment of treatment, death from toxicity (side effects), and excess relapse, in part due to lack of access to essential medicines and technologies addressing each of these gaps improves survival and can be highly cost-effective [iv]Incidence of childhood cancer worldwide is nearly 300,000 new cases per year.[v] The prognosis of malignancy in children depends primarily on two type extent of disease at diagnosis and rapidly on response to treatment. Objective: Identification of socio-demographic factors aggravating childhood malignancy. Methods: It was a cross-sectional study and conducted at pediatrichaemato oncology department, Dhaka Shishu (Children) Hospital. 111 children who were suffering from malignancy interviewed in this study after taken written concept from history and the rough physical examination was done and finding were recorded in a record form. Investigation reports collected from the patient's file and recorded in the record form. Results: On of 111 patient, among them 53(47.75%) patient are acute lymphoblastic leukemia. This study shows the educational level of the parents are primary level 40.54%, higher school level 27.02%.SSC level 13.50%, graduate and above 4.50%, illiterate 6.30%. Regarding occupational status of parents are most are labor, garments worker, driver. Study suggested more children (53.15%) were middle income and 36.94% were from lower income family and 9.91% from higher income group. Conclusion: So most patients (47.75%) are suffering from acute lymphoblastic leukemia which significant others. Majority of the respondents were, from middle income group. So prevalence of acute leukemia is high than other malignancy. Middle and lower income group people are more than high income group in our country. So there is burden for middle and low income group people to continue the treatment cost of malignancy.*

Key Words: *LMIC, Survival Rate, acute lymphoblastic leukemia.*

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I. Introduction

Cancer is the second leading cause of death globally, and is responsible for an estimated 9.6 million deaths in 2018. Globally, about 1 in 6 deaths is due to cancer.[vi]Approximately 70% of deaths from cancer occur in low- and middle-income countries.[vii]Around one third of deaths from cancer are due to the 5 leading behavioral and dietary risks: high body mass index, low fruit and vegetable intake, lack of physical activity, tobacco use, and alcohol use.[viii] Tobacco use is the most important risk factor for cancer and is responsible for approximately 22% of cancer deaths.[ix] Cancer causing infections, such as hepatitis and human papilloma virus (HPV), are responsible for up to 25% of cancer cases in low- and middle-income countries.[x]In Bangladesh, the

overall cancer burden including adolescent and childhood cancer is largely unknown due to the nonexistence of (population-based) cancer registries.[xi] The proportion of childhood cancers is expected to be high in Bangladesh because of the young population structure- about 47 % of the population is under 15 years old.[xii]Between 30-50% of all cancer cases are preventable.[xiii] Prevention offers the most cost-effective long-term strategy for the control of cancer. National policies and programs should be implemented to raise awareness, to reduce exposure to cancer risk factors and to ensure that people are provided with the information and support they need to adopt healthy lifestyles.[xiv] Childhood cancer is uncommon and a manifest with symptoms seen with being illness. In addition to the classic manifestations, any persistent, unexplained symptoms or sign should be evaluated as potentially emanating from a Cancerous or Pre-cancerous condition. As part of the diagnostic evaluation, the pediatrician and pediatric Oncologist must convey the possible diagnosis to the patient and family in a sensitive and informative manner.[xv] Now a day's possible risk factors including parental exposure to cancer-causing chemicals, parental exposure to pesticides, childhood exposure to common infection agents and living near a nuclear power plant have so far produced mixed results. Because of major treatment advances in recent decades more than 80% of children can now survive 5 years or more. So Childhood malignancy can be prevented through a series of preventive interventions. Assessing the determinants has one step ahead to reduce the prevalence of cancer and increased awareness on the terms.

II. Objectives

General Objective: To assess the pattern and socioeconomic factors of childhood malignancy.
Specific Objectives:a) To identify the socio demographic characteristics of the patients.
b) To find out the pattern of malignancy among them.

III. Literature Review

Childhood cancer is increasing day by day in Bangladesh unlike adult. Because of decreased infant mortality rates in developing countries resulting from better management of infectious diseases and current population growth, the number of childhood cancer is expected to increase by 30 % by 2020.[[xvi]]Although there has not sufficient data available for childhood malignancy in the country. Bangladesh does not have any precise figure on the number of children with cancer, but estimate suggests globally 200,000 new such cases are added to the tally each year.[xvii]As adults, childhood cancer survivors have a 30-fold higher risk than the general population of developing basal cell carcinoma, a Dutch study suggests.[xviii] Socio-demographic consideration were supposed to lead a role for aggravating pediatric cancer specially tobacco use, pesticide exposure, Air pollution, unhygienic condition. Early-life and childhood exposures to nutritional factors, infections, and chemicals can have long-term effects on the developing immune system, thus influencing risk of chronic immune-mediated disease in adulthood.[xix],[xx],[xxi]In the case of pesticides, prenatal or early-life exposures have been associated with a range of human health effects, including respiratory function, infections, and cancer.[xxii],[xxiii],[xxiv]Incidence and mortality rates of childhood cancers vary worldwide. Some of this variation may be attributable to differences in reporting. In children aged 0-14 years incidence rates range from less than 100 per million in areas of sub-Saharan Africa and India to more than 150 per million in some populations of North America and Europe.[xxv]It was found in others settings considering overall prevalence among children with cancer in low –middle income settings; measures of low Socio Economic status were uniformly associatedwith inferior outcome. The majority of these associations were statistically significant. The results in high income countries were less uniform althoughthe majority of associations (including all but one of the statisticallysignificant associations) also linked lower SES and worse outcome. In case of Bangladesh context, we found a few article considering childhood malignancy that supports. In other study in Bangladesh, socioeconomic status has a strong influence on mortality in adults.[xxvi]Leukemia is the most common childhood cancer, account for about one third of pediatric malignancies. It is a heterogeneous group of disease. It represents malignant transformation of marrow, peripheral lymphoid tissue or thymic cells. The relative incidence of malignancies seen at BSMMU in 2012 was: Acute lymphoblastic leukemia 58%, non-Hodgkin lymphoma 11%, acute meroblastic leukemia 10%, neuroblastoma 5%, Wilm's tumor 2%, hepatoblastoma 3.5%, Hodgkin lymphoma 3%, retinoblastoma 2%, germ cell tumors 2%, histocytosis 2%, and central nervous system tumors 1%, osteosarcoma 1% .As part of a twinning project in June 2012. After that there had a few number of research was seen. So, this study had a significant especially for the country in Dhaka Shishu (Children) Hospital to assess the determinants socio – economic factors and prevalence of the childhood malignancy. Studies of other possible risk factors, including parental exposure to cancer-causing chemicals, prenatal exposure to pesticides, childhood exposure to common infectious agents, and living near a nuclear power plant, have so far produced mixed results. Whereas some studies have found associations between these factors and risk of some cancers in children, other studies have found no such associations.

IV. Materials &Methods

Study Design- Cross sectional study.

Place and period of study- It is a Retrospective observational study conducted from July, 2014 to December, 2014, in Dhaka Shishu Hospital which is a tertiary hospital that provide care the children from all over the country.

Study Population- Children with malignancy were included.

Inclusion Criteria- Children who admitted in different Wards in Dhaka Shishu (Children) Hospital diagnosed a malignancy then referred to hematooncology Department age group 6 month to 12 years of age.

Exclusion Criteria- Relapse cases who received chemotherapy previously and secondary malignancies like previously treated as acute leukemia after 4 to 5 yrs developed secondary malignancy like lymphoma or other malignancy, and age group < 6 month and > 12 yrs of age.

Sample size: 111 children who were suffering frommalignancy.

Sampling Technique: Simple random sampling.

Data Collection Technique:

- Face to face interview
- Medical Record review

Data collection Tool: Semi-Structured Questionnaire and Check list.

Data Processing and analysis: After collecting data, It was checked and processed and analysis throughSPSS Version 17.

Ethical consideration: Permission was obtained from Ethical Review Committee of Dhaka Shishu (Children) Hospital authority and public health science department, Pediatric oncology Department of the hospital .Children and their parents or guardian admitted their patients through filled up a consent form. During data collection period, the purposes and importance of the study was discussed with parents, ethical review committee, Pediatric department head and experts.

V. Results

It was found in this study setting that Prevalence of Childhood malignancy in low and middle income settings is more seen than more high income settings. Among study population, the Socio-economic status as up to 7.000/month as lower income group which was 36.94%, 7,000 Tk. to 20,000 Tk. /month as middle income group was 53.15% and above 20,000 Tk. /month as higher income group was only 9.91%. In this study majority were from middle income group (Figure 2). The measures of low and Middle income settings of Socio Economic status were uniformly associated with inferior outcome. The majority of these associations were statistically significant. The results in high income countries were less uniform although the majority of associations (including all but one of the statistically significant associations) also linked lower SES and worse outcome. In this study, Most of the patients 47.75% (53 out of 111 Patients) had acutelymphoblastic leukemia. Others 19.82 % had Non-Hodgkin's lymphoma, 16.22% had Wilmstumour, 7.21% had Acute myeloblasticleukemia and the rest of the percentage had others type of malignancy. Study suggested that Most of the children were affected by acute lymphoblastic leukemia (Table 4). Study revealed that Most of the89(80.18%) patients had fever, 45.04% patients had bone pain, 52.25% patients present with bleeding manifestation and 51.35% patients had Lymphadenopathy. (Table 5) .53.95% patients had blast cell present in peripheral blood film.(table 7). Among the 111 cases , Most of the patients (32.43%,37.83%) are within 2-5 years of age and 5 to 8 years of age.(Table 1) In this study, Majority of the study population was male (67.57%)(Figure 1).Moreover, the educational level of the parents are primary level 40.54%, higher school level 27.02%.SSC level 13.50%, graduate and above 4.50%, illiterate 6.30%. Regarding occupational status of parents are most are labour, garments worker, driver. A few percent are service holder. (Table 2)

Table no l: Distribution of respondents by age among 111 cases most patients are within 5 to 8 yrs and 2 to 5 yrs of age (n=111).

Age	No	Percentage
6 months up to02 yrs	11	9.90%
02 yrs up to 05 yrs	36	32.43%
05 yrs up to08 yrs	42	37.83%
08 yrs up to 12 yrs	22	19.82%
Total	111	100%

(Exclusion criteria up to 02 yrs means patient not yet 02years)
In this study males are predominant, that 67.57%

Figure 1: Distribution of Respondents by Sex

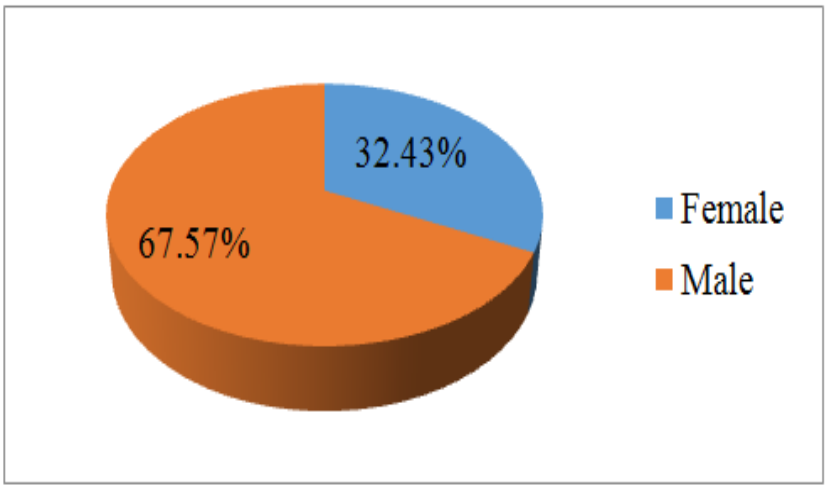


Table No.2 Socio demographic characteristics of the parents of children (n=111).

Variables	No	Percentage
Education level of parents		
Illiterate	7	6.30%
Primary	45	40.54%
Secondary	30	27,02%
SSC	15	13.50%
HSC	9	8.10%
Graduate and above	5	4.50%
Occupation status of parents		
Agricultural labour	22	19.80%
Non Agricultural labour	27	24.32%
Garments worker	25	22.52%
Ricksawpuller/ Driver	20	18.01%
Govt. service holder	5	4.50%
Non Govt. service holder	12	10.80%.

Table 3: Distribution of Respondents by Income Group Setting Socio Economic Status (n=111).

Lower income group	36.94%
Higher income group	9.91%
Middle income group	53.15%

Figure 2: distribution of respondents by socio economic condition.

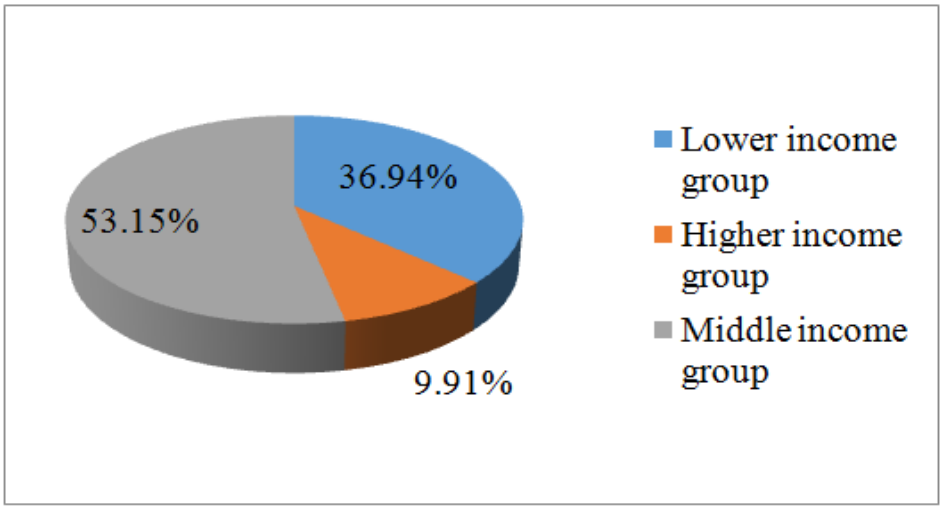


Table no 4: Distribution of respondents by typeof malignancy(n=111).

Type of malignancy	No of patient	Percentage
acute lymphoblastic leukemia	53	47.75%
acute myeloblasticleukemia	8	7.21%
nonhodgkin's lymphoma	2	19.82%
hodgkin's lymphoma	3	2.70%
Wilmstumour	18	16.22%
Neeroblastoma	5	4.50%
sacrococcxygealteratoma	2	1.80%
total	111	100%

Table no: 5 Distributions of respondents by symptom (n=111).

FEVER	No of patients	Percentage
Present	89	80.18%
Absent	22	19.82%
HONE PAIN		
Present	50	45.04%
Absent	61	54.95%
BLEEDING		
Present	58	52.25%
Absent	[53]	47.75%
LYMPHADENOPATHY		
Present	57	51.35%
Absent	54	48.65%

Table 6: Distribution of respondents by having hepatosopenomegaly(n=111).

Hepatomegaly	53.15%
Splenomegaly	34.23%

Figure 3: Distribution of respondents by having hepatosopenomegaly.

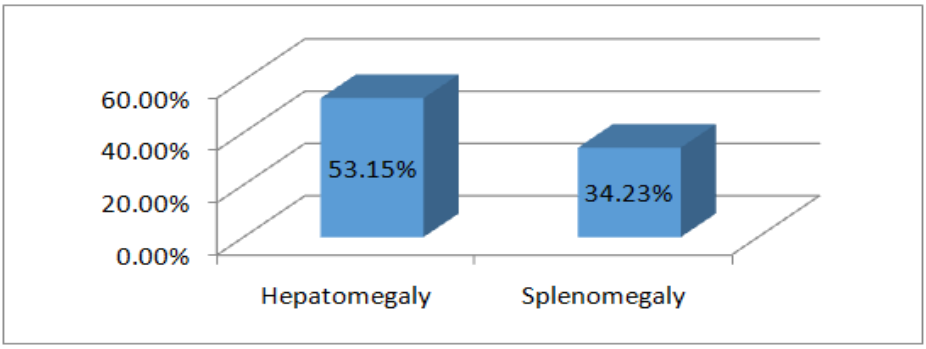
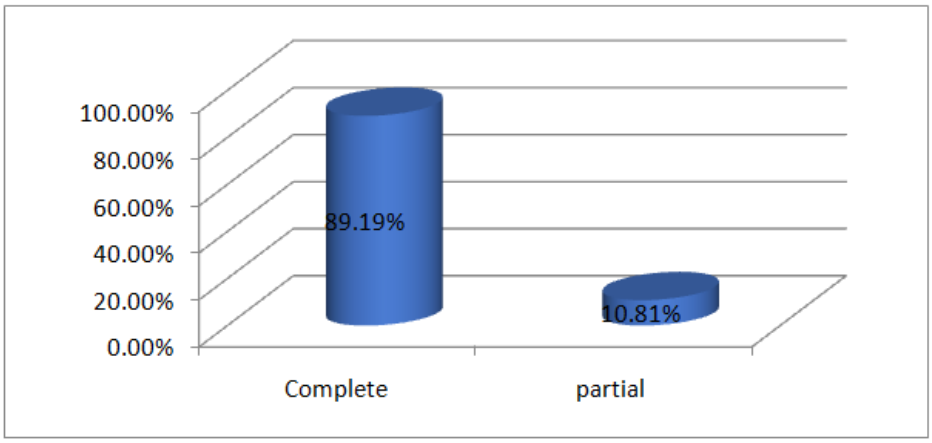


Table No.7 Distribution of Respondents by Having Blast Cell Present in Peripheral blood film (n=111).

Blast cellin peripheral blood film.	No of patients	Percentage
Present	61	54.95%
Absent	50	45.05%
Total	111	100%

Figure 4: Distribution of respondents by immunization status.



VI. Discussion

A total 111 patients were studied in this study. Among them majority are within 24 to 96 months of age. There is male predominance in my study. This Study done National Cancer institute where similar result was found. (National cancer policy, 2003)This study shows that education level of the parent's primary level 40.54%o, higher school level 27.02%, SSC level 13.50%, graduate and above 4.50%. In another study done by Ross, J.A. shows that their education level is higher than us. So we should need to increases the awareness. Low education level also the cause for delay in detection of disease. (Ross, J.A. 2005). Study shows that majority of the respondents were, from middle income group. Similar result was found by Boyd C and Zhang. Cancer survival is somehow: associated with socioeconomic status of the family. (Body, C. 1999).The measures of low and Middle income settings of Socio Economic status were uniformly associated with inferior outcome. The majority of these associations were statistically significant. The results in high income countries were less uniform although the majority of associations (including all but one of the statistically significant associations) also linked lower SES and worse outcome. Most of the children in study population had Acute lymphoblastic leukemia's which was in 47.75%, Others AML in7.21%, NHL in 19.82%,Wilms tumour in 16.22% &Neuroblastoma in 4.50% which is more or less similar to the study done by ware, a cancer journal for Clinicians 2014 and also byROSS, J.A. They found ALL 52% NHL 22%, wilmstumor 15% (ROSS, J.A.pediatric blood and cancer, 2005).Moreover, Study revealed that fever was present in most of the children (80.18%) , Similar as Bone pain was in 45.04% patients, hepatomegaly was in 53.15% patients , 34.23% patients had splenomegaly and also was bleeding present 52.25%. Immunization was completed among 89.19% of the patients. A study was done previously by Dr.BelayetHossain in Dhaka Shishu Hospital that fevers in 88%, hepatomegaly 75%.Splenomegaly 67%.Bleeding Manifestation 50%. Another report by Hoffbrand showed bone pain 50%.Comparison with those studies variation in present study. So prevalence of acute leukemia is high than other malignancy. Middle and lower income group people are more than high income group in our country. So there is burden for middle and low income group people to continue the treatment cost of malignancy.

VII. Limitation of the study

In my study there was some limitation that according to definition, Children considered as up to 18 yrs. But I had studied this part in Dhaka Shishu (Children) Hospital where patients admitted up to 12 years of age. That's why only up to 12 years of age is considered. Moreover, the study considers only the children who were admitted in Dhaka shishu (Children) hospital. Moreover, the study had only a few number of sample population.

VIII. Conclusion & Recommendation:

Considered all others information, relation with global attributes, the study revealed that Children are mostly vulnerable in acute lymphoblastic leukemia. Most of the affected Children are from low and middle income settings. This studies had a sharper consideration on that the people in the community who are mostly uneducated and lived their daily life with daily labour had been mostly identified their children with cancer. As

treatment of childhood cancer required sophisticated technology, expertise for diagnosis, treatment and monitoring late efforts. It considered more cost than normal disease treatment. So there had a lot of children available affected by childhood cancer but they are not early diagnosed as they did not have sufficient capacity and there has a limited resource. This research recommended that State should be take necessary steps for early diagnosis of the vulnerable children who are poor. Strategy should be taken so that Promotion and treatment of childhood malignancy will be easy in Bangladesh. Environmental factors, genetic disorder, Tabaco use and others considerable risk factors should be noted and more efforts on preventive intervention should be promoted. Classical manifestations, in persistent unexplained symptoms should be evaluated as early as possible. So there should be needed to increase the awareness, healthy life style, early detection of diseases to ensure the better outcome.

IX. Acknowledgement

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Conflict of interest: The Author has no conflict of interest.

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