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Hodgkin's lymphoma of the childhood: Experience of single hemato-oncology center

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Abstract:

BACKGROUND: Hodgkin's lymphoma (HL) is a malignant lymphoma that accounts for approximately 7% of childhood cancers. The incidence of HL in childhood varies by age; it is the most common childhood cancer in the age group of 15–19 years.

OBJECTIVE: The objective of the study is to determine the clinical presentation and outcome of HL among children under 15 years of age.

PATIENTS AND METHODS: A retrospective study carried out at the hemato-oncology department of child's central teaching hospital included 46 HL patients under 15 years of age who were diagnosed over 6 years from January 2010 to December 2015. Demographic characteristics, histopathological and clinical features, treatment modalities, response to treatment, and outcome were obtained from the records files of the patients.

RESULTS: Among a total of 46 children with HL, there were 33 (71.7%) males and 13 (28.3%) females; the male-to-female ratio was 2.1:1; the mean age of this study was 8.3 years. Lymphadenopathy was the most common sign, with cervical lymph node being the most common primary site of involvement. 47.8% of the atients present with Stage II, and the mixed cellularity histopathological subtypes were the common recognized subtype. Event-free survival (EFS) is 78.3%, and overall survival (OS) was 95.5%.

CONCLUSION: Two-year OS (95.5%) and EFS (78.3%) of the HL patients were accepted as compared to other studies.

Keywords:

Chemotherapy, childhood, Hodgkin's lymphoma, outcome

Introduction

Hodgkin's lymphoma (HL) is a neoplasm characterized by relatively small numbers of clonal malignant Hodgkin/Reed–Sternberg (HRS) cells in an abundant reactive cellular background.[1,2] The malignant HRS cells are derived from the germinal center B-cells but have characteristically lost the phenotypic features of these cells.[1-3] HL occurs most frequently in two separate age groups, the first being young adulthood (age 15–35 years) and the second being in those over 55 years old.[4] Event-free survival (EFS) rates and overall survival (OS) rates with the current treatment protocols among low-risk, intermediate-risk, and high-risk disease patients are approximately 92%, 85%, and 83%, and 98%, 93%, and 94%, respectively.[5,6]

Aim of the study

The aim of the study is to determine clinical presentation, histopathological features, stages, and outcome of HL among children under 15 years of age.

Patients and Methods

A retrospective study carried out at the child's central teaching hospital, over 6 months from May 1 to October 31, 2017,

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included 46 patients under 15 years of age who diagnosed with HL during the period from January 1, 2010, to December 31, 2015. The study was approved by review ethical committee of child central teaching hospital.

The information collected from the records file included age, gender, date of diagnosis, duration of disease before diagnosis, clinical presentation, stage of disease, histopathological types, investigations, treatment modality, and outcome.

Chemotherapy protocols that used for treatment of HL patients were (ABVD and ABV/COPP) chemotherapy regimen. ABVD regimen consists of (Adriamycin, Bleomycin, Vinblastine, Dacarbazine) which used in 37 (80.4%) patients and ABV/COPP chemotherapy regemin consists of (Adiamycin, Bleomycin, Vinblastine/ alternating with Cyclophosphamide, Vincrestine, Prednisone, and Procarbazine) which used in 9 (19.6%) patients, according to drugs availability. 6-8 courses of (ABVD or ABV/COPP) were given every 28 days, each course contain two cycles, repeated every 14 days. Radiotherapy was received in 12 patients only. Evaluation of the patients depends on clinical assessment and imaging studies include ultrasound, computed tomography scan (in 15 patients), and positron emission tomography scan (in 26 patients). The follow-up after achieve remission was every 2 months for the first 6 months and then every 3 months for 2 years. The maximum period of follow-up was 2 years. A statistical analysis was done using IBM SPSS Statistics for Windows, Version 21 Armonk, NY: IBM Corp) evaluating mean and median.

Results

Male-to-female ratio was 2.1:1; the mean age was 8.3 years. Lymphadenopathy (LAP) was the most common sign observed in 42 (91.3%) patients, and cervical lymph node was the most common primary site of involvement than the other lymphatic regions, the commonest histopathological subtype was Mixed cellularity, presented in (43.5%) of the patients and approximetely half of the patients had Stage II disease. as shown in Tables 1,2, 3 and Figure 1 respectively.

Treatment outcome and survival

Of 46 patients who received chemotherapy, 2/46 (4.3%) patients abandoned, while 44/46 (95.7%) patients completed treatment. 40/44 (91%) of them got complete response and achieved remission while 4 (9%) patients got no/partial response. No patient died during the treatment. Of four patients who were no/partial response, three of them achieved remission after received treatment of resistant disease and one patient died [Table 4].

Among 40 patients who were achieved complete remission, 36 (90%) of them got continuous complete remission and four (10%) of them got relapse within a period of maximum 2 years of follow-up (all of relapsed patients received rescue treatment of relapse protocols; three patients remained alive free of disease, and one patient died during the treatment due to progressive disease). Over a maximum 2 years' period of follow-up,

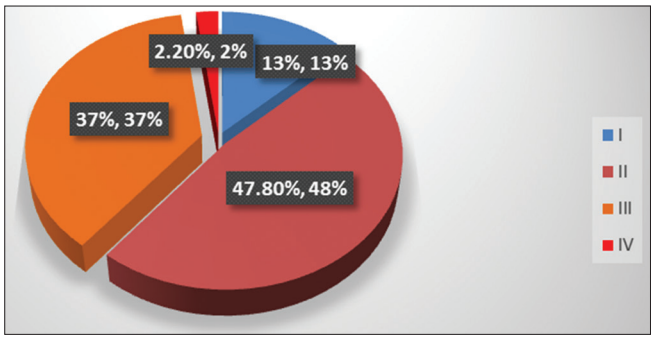

Figure 1: Staging of the patients in the study group

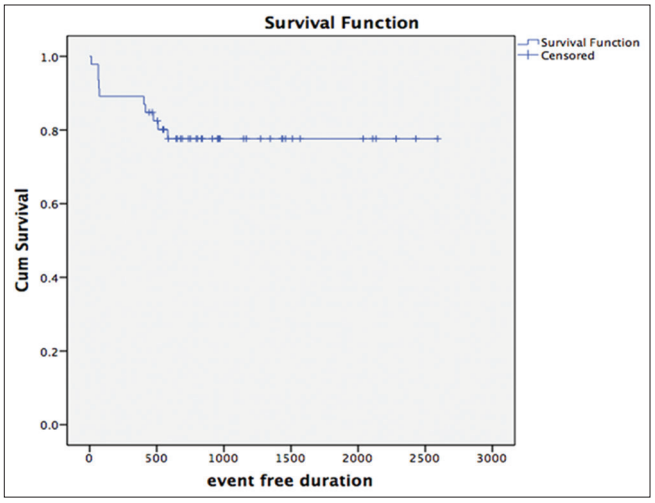

Figure 2: Event-free survival of 2 years' duration

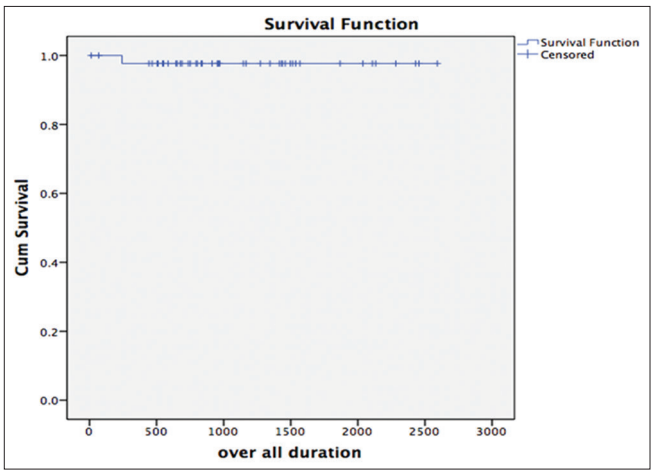

Figure 3: Overall survival of 2 years' duration

Table 1: Frequency of presenting signs and symptoms*

Signs and symptoms	Frequency (%)
LAP	42 (91.3)
B symptom	19 (41)
Splenomegaly	11 (23.9)
Hepatomegaly	7 (15.2)
Pulmonary symptom	6 (13)
Abdominal distension	4 (8.7)
Pruritus	3 (6)
Pallor	1 (2.2)
Jaundice	1 (2.2)

*The patient may have more than one presenting sign and symptom.
LAP=Lymphadenopathy

Table 2: Distribution of patients according to the primary site

Primary site	Frequency (%)
Lymphatic region	
Cervical	42 (91.3)
Abdominal	18 (39.1)
Mediastinal	14 (30.4)
Supraclavicular	13 (28.3)
Axillary	4 (8.7)
Generalized	1 (2.2)
Extralymphatic organ	0
Spleen	4 (6)

Table 3: Frequency of histological types among Hodgkin's lymphoma patients (*n*=46)

Histological type	Frequency (%)
Classical type	
Mixed cellularity	20 (43.5)
Nodular sclerosis	16 (34.8)
Lymphocyte rich	7 (15.2)
Lymphocyte depletion	2 (4.3)
Nonclassical	
Nodular lymphocyte predominant	1 (2.2)

Table 4: Outcome of 44 Hodgkin's lymphoma patients who completed treatment

Outcome	Frequency (%)
Complete remission	40 (91)
No response	3 (6.8)
Partial response	1 (2.2)
Died	0
Total	44 (100)

Table 5: Two-year event-free survival

Total number of patients	Number of events	Censored, *n* (%)
46	10	36 (78.3)

Table 6: Two-year overall survival

Total number of patients	Number of death	Censored Number of alive (%)
44	2	42 (95.5)

the EFS was 78.3% and OS was 95.5% [Tables 5, 6 and Figures 2, 3].

Discussion

In this study that described the outcomes of patients with Hodgkin's disease in our institution, the age of the patients at presentation ranged from 3.6 to 14.8 years (median 8 years), which is comparable to the study of Sherief *et al*.[7] (median age 6 years). Males were more predominant than females, (male : female ratio 2.5:1); male predominant was reported by many studies in developing and developed countries.[7-10] Majority of the patients presented with cervical LAP (91.3%) which was in agreement with several authors.[11,12] In the current study, 6% of the patients had splenic involvement which was different from that mentioned in the study by Arya *et al*.,[13] in which splenic involvement was found in 15.6%. This study recorded that 41% of the patients had B symptoms, which approximate to the results of the study by Sherief *et al*.[7] (39% had B symptoms). Majority of the patients had classical HL with mixed cellularity subtype being the most common one, which is consistent with many other studies such as Laskar *et al*.[14] and Baez *et al*.[15] In this study, patients with advanced disease (Stage III and IV) were found to constitute 39.2% which approximate to the results of the study by Sherief *et al*.;[7] however, more than half of the patients have advanced disease (Stage III–IV) in less economically developed countries;[11,15] in contrast to the Western countries, 75% of newly diagnosed patients have early disease at presentation (Stage I–II)[16] perhaps because of delayed diagnosis and referral. Overall Survival(OS), and Event Free Survival (EFS)of the current study were 95.4% and 78.3%, respectively which approximate to that mentioned in the study by Uysal KM *et al*.[17] in Turkey reported 5-year OS of 96% and EFS of 72%, Fadoo *et al*. in Pakistan[18] (OS 94%.). However, slightly lower than results of Fermé *et al*. (OS 98%),[6] Sherief *et al*. (OS 96.6% and EFS 84.7%),[7] Pourtsidis *et al*.[19] (OS 98% and EFS 86.2%). Angiotensin-converting enzyme (ACE) expression of the lymphoma-associated macrophages in the lymph nodes of HL may represent the point of cross-talk between renin-angiotensin system and lymphomagenesis. ACE could serve in the pathobiological function of the tissue-based macrophages in tumorigenesis of HL.[20]

Conclusion

Cervical LAP was the most common clinical presentation of HL patients. Stage II disease and mixed cellularity histopathological subtype were common among HL patients. Two-year OS (95.5%) and EFS (78.3%) of HL patients were accepted in comparison to other studies.

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Conflicts of interest
There are no conflicts of interest.

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