ORIGINAL ARTICLE

MALIGNANT HEMATOLOGICAL DISORDERS ON BONE MARROW ASPIRATION : AN EXPERIENCE FROM TERTIARY CARE HOSPITALS

Hamzullah Khan,[1] Riaz Uddin Ghori,[2] Fakhre Alam Khattak,[3] Toqeeer Ahmad[4]

[1]Department of Pathology, Nowshera Medical College, [2]Khyber Teaching hospital, Peshawar, Pakistan, [3]Policy Adviser UN office Geneva Switzerland, [4]Department of Pathology, Gomal Medical College, D.I.Khan, Pakistan

ABSTRACT

Background: Bone marrow aspiration is a diagnostic test for various hematological malignancies. Present study was designed to determine the frequency of malignant Hematological disorders on bone marrow aspiration.

Material and Methods: This cross sectional study was conducted in the Department of Hematology Khyber Teaching Hospital Peshawar and Qazi Hussain Ahmed Medical Complex Nowshera from Mar 2016 to June 2017. The demographic variables were age, sex and address of the patients, while the research variables were types of hematological disorder. All the variables presented in percentages to find out the frequencies for each variable.

All cases with non-malignant hematological disorders (Anemias, infections etc) disorders were excluded. Relevant information was recorded on a predesigned proforma prepared in accordance with the objectives of the study.

Results: Out of 102 cases 38% having malignant hematological disorders with age range from 7-76 years. There were 58.21% females and 48.79% males. Majority of the patients were in the age range group 7 to 17 years age 43.59%. Mean age of patient with Standard Deviation was 27±2 years. Mode of age was 27 years. We also received pediatric cases 43% for knowing the cause of various malignant hematological disorders. The frequency of various malignant hematological disorders were; Acute Myeloid Leukemia 33.34%, Acute Lymphocytic Leukemia 30.77%, Chronic Myeloid Leukemia 17.98%, Chronic Lymphocytic Leukemia 7.69% and Multiple Myeloma 10.26%.

Conclusion: Acute Myeloid Leukemia was the most common malignant hematological disorder followed by Acute Lymphocytic Leukemia. AML was most common cause of pancytopenia in our patients among the malignant hematological disorders. Multiple myeloma were also remarkable.

KEY WORDS: Bone Marrow Study; Leukemia; Hematological Disorders.

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INTRODUCTION

Bone marrow examination has a very important role in diagnosing the cause of different hematological disorders. A local study reported that acute myeloid leukemia is the most common hematological malignancy in their study.[1]

They reported 8 (34.78%) cases of acute lymphoblastic leukemia and 6 (26.08%) with acute myeloid leukemia.[2] another study from Peshawar Pakistan reported that 105 cases (24.76%) of leukemias in their target population with acute lymphoblastic leukemia as the commonest malignancy in our patients (17.92%).[3] Approximately 2500 cases per annum are diagnosed in the United States, accounting for about One third of all the cases of childhood cancers. Eighty percent of these are acute lymphoblastic leukemia (ALL), 17% are acute myeloid leukemia (AML) and the rest are cases of chronic myeloid leukemias.[4]

A study from Lahore reported that hematological malignancies accounted for about 39 cases (27.27%). Out of these, 23 cases (58.97%) were of acute leukemia including both acute myeloid and acute lymphocytic leukemia; nine cases (23.07%) were of acute leukemia while eight cases (20.15%) of acute myeloid and 06 cases (15.38%) of acute lymphoblastic leukemia. Five cases (12.83%) of multiple myeloma were reported and 4 cases of chronic myeloid leukemia (10.25%).[5]

Corresponding Author:

Dr. Hamzullah khan
Assistant Professor, Department of Pathology
Nowshera Medical College
Nowshera, Pakistan
E-mail: hamzakmc@gmail.com

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Among the leukemias, AML is the most common malignant disorder and it counts as major cause of bicytopenia and pancytopenia in the bone marrow studies performed. Out of total 35 cases of leukemia, 21(14.2%) were Acute Myeloid Leukemia and 6(4.1%) were Acute Lymphocytic Leukemia.[6]

Present study was therefore conducted to know the frequency of various hematological malignancies in our set up.

MATERIAL AND METHODS

A total of 102 patients were enrolled as received in the department of Hematology KTH and Qazi Hussain Ahmed Medical Complex Nowshera for bone marrow study from different units of the hospitals irrespective of age and gender. Duration of study was from Mar 2016 to June 2017. Out of total cases 39 (38%) were cases with malignant hematological disorders and only those were further studied. The sampling was random and purposive only cases with hematological disorders were included.

Non Malignant hematological disorders like anemias etc were excluded.

Bone marrow aspiration was done under aseptic condition. Site was properly covered only working area (PSIS) was visible and dressed with pyodine. Majority of the aspirated sampling collected from the posterior superior iliac spine. In pediatric cases soecially in age less than ten years the bone marrow aspiration was done from anterior superios aspect of shin bone.

Initially local anesthesia was given at the site and skin and periosteum anesthetized. Then proper aspiration needles for specific age was used to aspirate the bone marrow. 10-12 slides were prepared and stained with Giemsa and iron (Persian blue) stain for proper study. Where any suspicion in cell morphology expected then peroxide (POX) stain was used to differentiate myeloid series pathology from lymphoid one. After collecting sampling the dressing pad applied to the site and thanked to patient.

All the slides were reported by the consultant Haematologist. All patient reticulocytes count was also calculated using retic stain. And data was entered in MS-Excel 2010 for analysis. The data collected were analyzed by measuring central tendency parameters. The demographic variables were age, sex and address of the patients, while the research variables were types of hematological disorder. All the variables presented in percentages to find out the frequencies for each variable.

RESULTS

A total of 102 patients were enrolled , 39 (38%) were cases with malignant hematological disorders were further studied. There were 20 (58.21%) were females and 19(48.79%) were males (Table 1).

The age range of the patients was from 7 years up to 76 years of age. Majority of the patients received for bone marrow examination were in the age range group 7 to 17 years age (43.59%). Mean age of patient with Standard Deviation was 27$\pm$2years. Mode of age was 27 years. We also received pediatric cases (43%) for knowing the cause of various malignant hematological disorders (Table 2).

Sixty seven percent of the patients were having normal retic count, 23% had retic count between 1.3-2.3 (Table 3).

The frequency of various malignant hematological disorders were; Acute Myeloid Leukemia 13(33.34%), Acute Lymphocytic Leukemia 12(30.77%), Chronic Myeloid Leukemia 7 (17.98%), Chronic Lymphocytic Leukemia 3 (7.69) and Multiple Myeloma 4(10.26%) (Table 4).

Table 1: Gender wise distribution of patients.

Gender of patients	Total	Percentage
Females	20	51.28
Males	19	48.72
Grand Total	39	100

Table 2: Age range of patients.

Age Range of patients	Total	Percentage
7-16	17	43.59
17-26	5	12.83
27-36	13	33.34
37-46	1	2.56
47-56	1	2.56
57-66	1	2.56
67-76	1	2.56
Grand Total	39	100

Table 3: Reticulocytes count of patients.

Retic count	Total	Percentage
0.3-1.3	26	66.67
1.3-2.3	9	23.08
2.3-3.3	3	7.69
3.3-4.3	1	2.56
Grand Total	39	100

Table 4: Frequency of malignant hematological disorders.

Malignant hematological disorders	Total	Percentage
Acute lymphocytic leukemia	12	30.77
Acute myeloid leukemia	13	33.34
Chronic lymphocytic leukemia	3	7.69
Chronic myeloid leukemia	7	17.95
Multiple myeloma	4	10.26
Grand total	39	100

DISCUSSION

Blood disorders are very common ranging from anemias to hematological malignancies. Bone marrow aspiration is a key investigation for hematological disorders. A study reported that in 168 patients under study, 39 (25%) had the hematological malignancies.[5] In our study we found that Acute Myeloid Leukemia was diagnosed in 13 (33.34%) cases, Acute Lymphocytic Leukemia 12 (30.77%), Chronic Myeloid Leukemia 7(17.98%), Chronic Lymphocytic Leukemia 3 (7.69) and Multiple Myeloma 4 (10.26%). In United States 2500 cases per year are that counts about 1/3rd of all the cases of Pediatric hematological cancers. In early age 80% are acute lymphoblastic leukemia (ALL), 17% are acute myeloid leukemia (AML) and remaining are chronic myeloid leukemias.[7] A study conducted on cytogenetics characteristic of ALL and AML in Pakistan reported 21 (14 males, 7 females) cases were in pediatric age group (91%) between 1-15 years.[8]

Of the total malignant samplings, 20(58.21%) were females and 19(48.79%) were males another study from kohat Khyber Pukhtoonkhwa reported that 20 (50.7%) were females and 19 (49.3%) were males among the diagnosed cases of hematological malignancies[6]. The age range of the patients was from 7 years up to 76 years of age. Majority of the patients received for bone marrow examination were in the age range group 7 to 17 years age (43.59%) another study from our province reported that 36.6% of cases were in age range 0-18 years (pediatric age group).[6]

In present study the frequency of various malignant hematological disorders were; Acute Myeloid Leukemia 13 (33.34%), Acute Lymphocytic Leukemia 12 (30.77%), Chronic Myeloid Leukemia 7 (17.98%), Chronic Lymphocytic Leukemia 3 (7.69) and Multiple Myeloma 4 (10.26%) that strongly coincides with the national studies reported from the same province.[5,6]

Comparing with another study in Pakistan among pediatric age, Rahim et al, noted only 6.36% AML and 17.92% cases were ALL.[3] The prevalence of ALL in our study is lower than as reported from India and China.[7] In a study published by Tariq et al (2010), out of 50 cases, 19 (36%) were with neoplastic disorders.[9] Another study reported 50 leukemia patients 23 (46%) were confirmed ALL, 15 (30%) AML,11 (22%) cases of CML and 1 (2%) case of CLL that also coincides with our findings.

CONCLUSION

Acute Myeloid Leukemia was the most common malignant hematological disorder followed by Acute Lymphocytic Leukemia. AML was most common cause of pancytopenia in our patients among the malignant hematological disorders. Multiple myeloma were also remarkable.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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None declared.

AUTHORS' CONTRIBUTION

Conception and Design:	HK, RUG
Data collection, analysis & interpretation:	HK, RUG, FAK, TA
Manuscript writing:	HK, FAK, TA