

**BONE MARROW EXAMINATION
FINDINGS OF A SINGLE CENTRE- AN
ORIGINAL ARTICLE.**

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Introduction

- Bone marrow examination is an important diagnostic tool for both haematological and non-haematological diseases, evaluation of anaemias and pyrexia of unknown origin and infective diseases. This procedure is also valuable to observe the effect of chemotherapy, duration of bone marrow aspirate and other forms medical treatment.^{1,2} In bone marrow examinations, along with history, clinical examination, and peripheral blood films; a morphological diagnosis was made. For morphological examination Leishmein stain, cytochemistry and iron stain can be done.² This is an invasive procedure which has some amount of

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physical and psychological trauma with rare complications. A number of aspirations are dry tap, blood tap or inadequate material.

- In Bangladesh, bone marrow examination reports are exclusively done by the haematologists. In this study we tried to find out the disease prevalence, limitations and rationality of the bone marrow examination in one tertiary centre.

Materials and methods

- **Type of study:** Retrospective observational registry based study
- **Place of study:** Department of Haematology in Sir Salimullah Medical College & Mitford Hospital.
- **Duration of study:** January 2010 to December 2010 (One year)
- **Data collection:** A hand written registry book of the department of Haematology, Sir Salimullah Medical College & Mitford Hospital was kept from the year of its establishment of independent working, 2008.
- **Data analysis:** Data was analyzed in Microsoft Excel and presented with tables and graphs.

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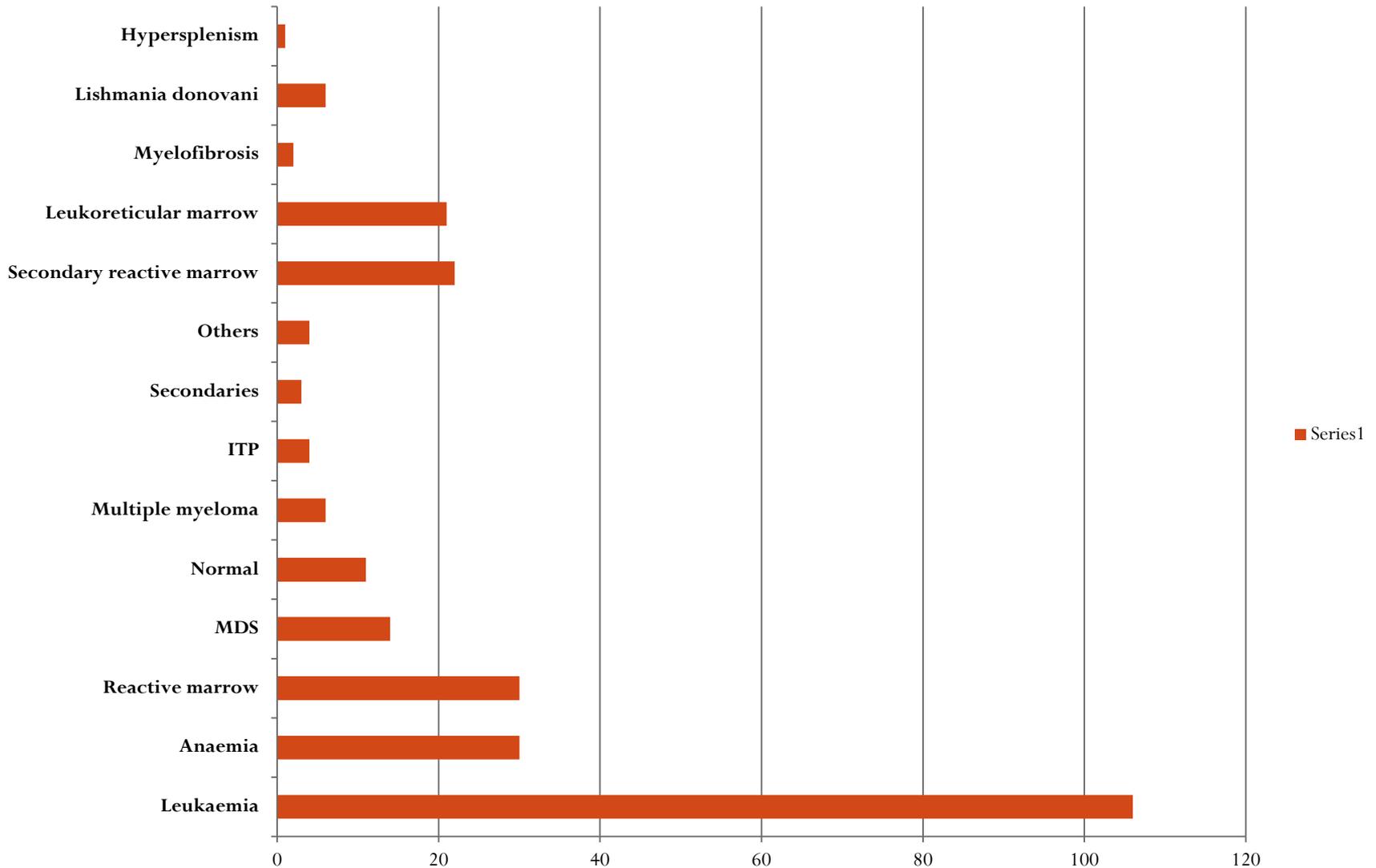
- **Inclusion criteria:** Patients were from the department of haematology and all other department including both adult and paediatrics.
- **Exclusion criteria:** Cases of aspiration failures.
- **Examination:** Bone marrow reports made here is based on morphology only with leishmein's stain.
- **Ethical Clearance:** No ethical issue is raised here as data was collected from medical records kept for departmental activities in a public medical college hospital and it does not reveal any personal information which may cause any harm to any subject.

Results

- A total of 261 bone marrow reports are included in this study. This number does not include the aspiration failure cases. The bar chart shows acute Leukemia is the most common disease with 97 cases in total where AML is the most prevalent diseases with 57 cases closely followed by ALL 40 cases.
- In case of leukemia and multiple myeloma cases are reported separately. Erythroid, myeloid, megakaryocytic and eosinophilic marrow hyperplasia are grouped under reactive marrow which represent about 30 cases.

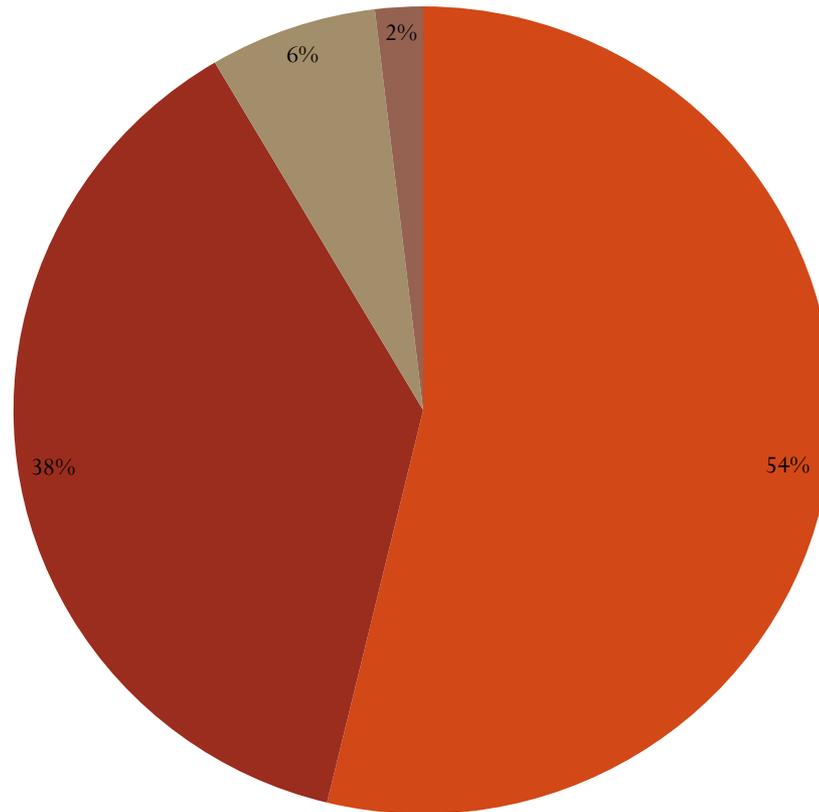
Disease	Type	Number	Total
ALL	New	22	40
	Old	18	
AML	New	46	57
	Old	11	
CML		7	7
CLL		2	2
Aneamia	Iron Deficiency	2	30
	Combined Deficiency	9	
	Aplastic Anaemia	18	
	Megaloblastic Anaemia	1	
Normal reactive marrow	Normal	8	11
	Myeloid Hyperplasia	3	
Reactive marrow	Erythroid hyperplasia	16	30
	Myeloid hyperplasia	7	
	Erythoid and myeloid hyperplasia	4	
	Erythroid and megakaryocytic hyperplasia	1	
	Eosinophilic hyperplasia	1	
	Excess blast	1	
Secondary reactive marrow			22
Leucoreticular marrow	LRM	20	21
	Lymphoblastic malignency	1	
Multiple myeloma			6
MDS	MDS	1	14
	Refractory anaemia	8	
	RAEB-T	4	
	Hypoplastic	1	
Megakaryocytic hyperplasia			1
ITP			4
<i>Leishmania donovani</i>			6
Myelofibrosis			2
Hyperplastic marrow with hypersplenism			1
Secondaries			3
Other	MHA	1	4
	Acute erythroleukaemia in complete BM remission	1	
	Progressive Marrow failure	2	
Total			261

Shows prevalence of different types of diseases in bone marrow findings.



Different types of Leukaemia

■ AML ■ ALL ■ CML ■ CLL

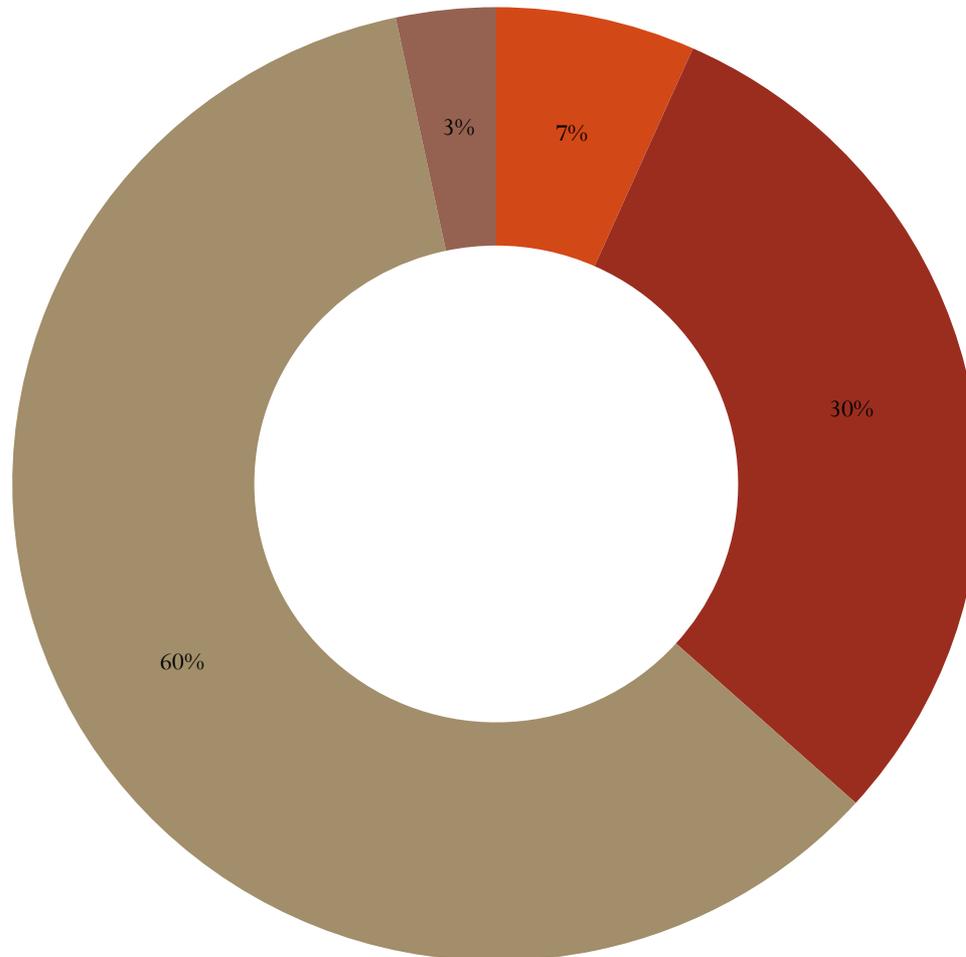


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- Different types of anaemia are in separate groups. Different types of anaemia includes iron deficiency, combined deficiency, megaloblastic and aplastic anaemia. Among these, aplastic anaemia (18 cases) are more prevalent with closely followed by combined deficiency (9 cases). The fewer incidences are Iron deficiency and Megaloblastic anaemia.

Different types of Anaemia

■ Iron deficiency anaemia ■ Combined deficiency anaemia ■ Aplastic Anaemia ■ Megaloblastic Anaemia

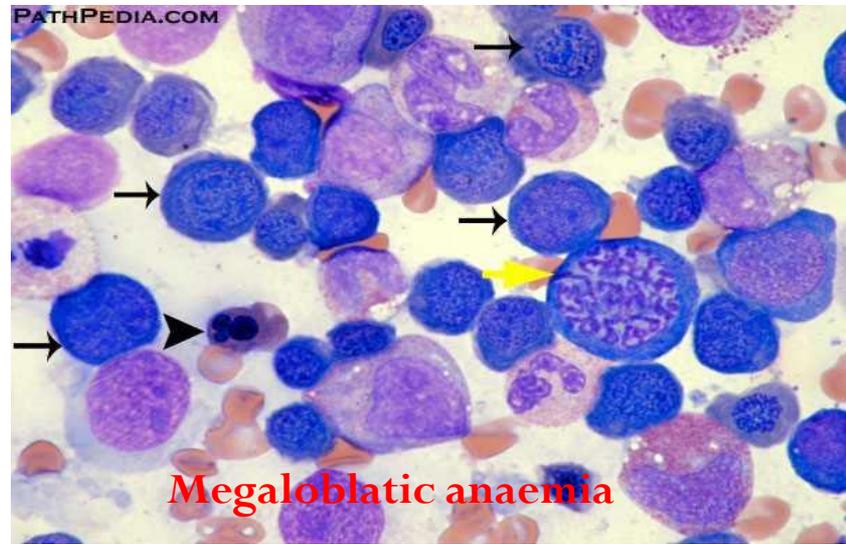
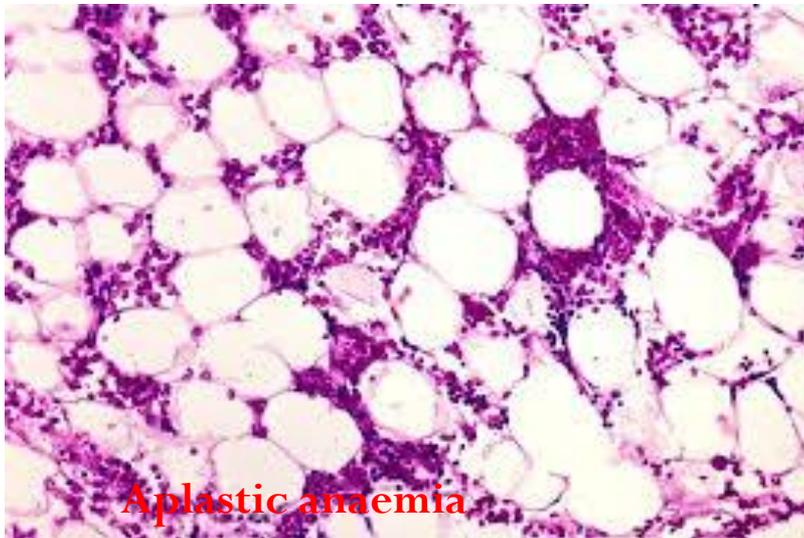
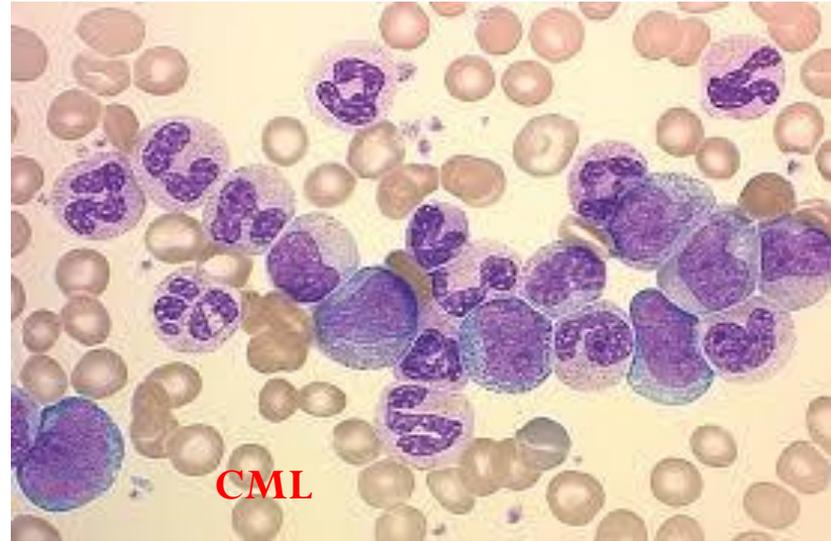
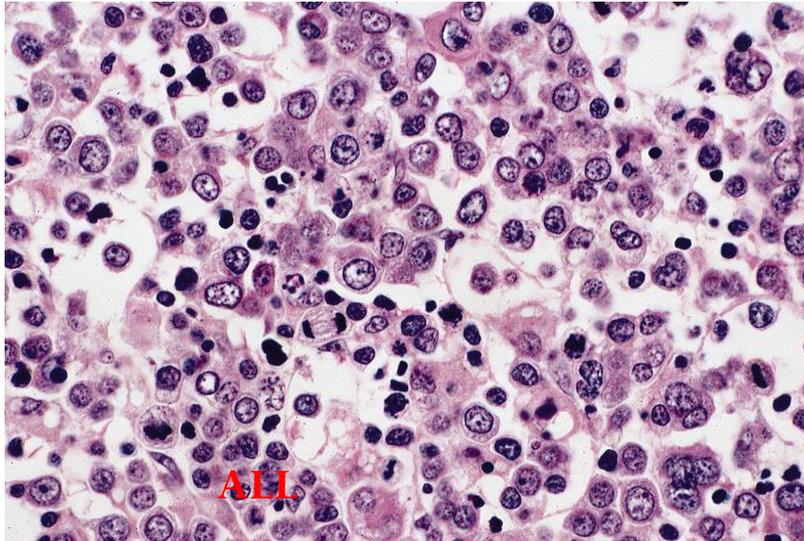


Discussion

- Bone marrow examination is a very invasive but very important laboratory tests for diagnosis of different kinds of hematological malignancy and non-hematological malignancy but it is done in government hospital without payment. It also may helpful for diagnosis in different kind of infectious diseases and different types of anaemia. Initially at SSMC & Mitford hospital bone marrow examination were done free of cost. But now a days it takes only 100 taka for examination. Country like Bangladesh, it is very helpful as a diagnostic tool for diagnosis of different diseases.

- Though the bone marrow examination is an invasive procedure, but it takes only minimum pain or complication if efficiently done by skill hands. The examination findings are reviewed by most experience hematologists at the centre. The major drawback was that the finding was not further investigated by immunophenotyping and cytogenetic study. Morphological diagnosis is our mainstay for diagnosis and evaluation of treatment.
- In this study, About 57 (54% of total Leukaemia) cases are found AML in relation to ALL about 40 (38%) cases. In case of CML total case found 7(6.60%) and CLL are 2 (1.88%).

Different types of Bone Marrow finding



- In different types of anaemia most common features are found to be aplastic anaemia (60%). Next is the combined deficiency anaemia (30%), and then are iron deficiency anaemia (6.67%) and megaloblastic anaemia (3.33%). The last 3 anaemias are due to micro-nutrient deficiencies.
- In bone marrow study, there are significant numbers are found to be normal reactive marrow, about 11 (about 4.1% of total marrow finding). In reactive marrow the total number are 30 (about 11.49% of total bone marrow) from where erythroid reactive marrow are predominant (16) than the myeloid reactive (7) and combined of erythroid and myeloid reactive (4). There are also secondary reactive marrow are about 22 (8.43% of total marrow).

- About 6 represent multiple myeloma and 14 are representing as myelodysplastic syndrome. About 4 represent as ITP. 2 findings represent as myelofibrosis and 3 are secondary deposition. 6 are diagnosed as *Leishmania donovani*.
- Other findings present in this study are Lymphoreticular marrow (about 21), Hyperplastic marrow with hypersplenism (1) and other nonspecific finding (4).

Conclusion

- Bone marrow examination is a minimal invasive which helps to diagnosis many haematological and non haematological diseases. Through this study we show only the bone marrow examination finding for diagnosis which was not confirmed by other supportive investigations. Though the number is very small but it represent the statistical finding of the country.

Limitation

- The numbers of bone marrow examination findings are small in number. It should be a larger number to represent the statistical features of the country. As the diseases are diagnosed only by the bone marrow finding, it should be confirmed by other supportive investigations.

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THANK YOU



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