LETTERS TO EDITOR

SPECTRUM AND ANALYSIS OF BONE MARROW FINDINGS IN ANEMIC CASES

Sir,

Prevalence of anemia is disproportionately high in developing countries due to poverty, inadequate diet and poor access to health resources.[1] Anemia is not a diagnosis, but a manifestation of an underlying disorder. Thus, even mild asymptomatic anemia should be investigated to diagnose and treat the primary cause. Lab evaluation without marrow examination is usually not confirmatory.[1]

Retrospective analysis of all cases of anemia with subsequent bone marrow examination in 3.5 years (from October 2003 - March 2007) was done at Govt. Medical College and Hospital, Dept. of Pathology, Chandigarh. The bone marrow examination was done for standard indications. The inclusion criterion was the presence of anemia; non-anemic cases were excluded. The marrow examination was done in the hematology section of the department. The aspirates were analyzed with MGG staining and special stains including cytochemical and immunohistochemical stains were applied as needed. The demographic data, clinical symptoms, complete hemogram, bone marrow aspirates and marrow biopsies were analyzed.

Bone marrow examination of 742 non-pediatric (>15 years) patients was broadly divided into non-malignant and malignant hematological disorders. Malignant hematological disorders comprised 133(18.0%) cases. Acute leukemia, CMPD, lymphoma, CLL and MM was present in 41%, 30%, 14.2%, 7.5% and 7% cases respectively [Figure 2]. Non-malignant hematological disorders formed the major group (609 cases) [Table 1]; the majority of cases were of megaloblastic anemia (87%), with the rest being megakaryocytic thrombocytopenia (2.9%), infectious disorders (3%), hypo cellular marrow (2.6%) and excess eosinophils (2.2%) [Figure 1]. Out of 609 cases, megaloblastic anemia with adequate and low iron stores was present in 421(69.1%) and 108(17%) cases respectively. Patients with adequate iron stores had thrombocytopenia, leucopenia and pancytopenia in 74%, 62.4% and 59% cases while patients with low stores had

Table 1: Clinical findings in megaloblastic anemia

		Megaloblastic anemia with adequate iron stores (421 cases)	*Megaloblastic anemia with low iron stores (108 cases)*
Degree of anemia	Mild	84(19.9)	11(10.0)
	Moderate	138(32.7)	28(25.9)
	Severe	199(47.2)	69(63.8)
Chief complaints	Weakness	413(98)	106(28)
	Easy fatigue	374(87)	98(92)
	Anorexia	168(40)	83(71)
	Fever	262(61)	33(28)
Organomegaly	Splenomegaly	65(15)	19(16)
	Hepatomegaly	54(12.5)	14(12)
	Lymphadenopathy	1(0.2)	5(4)

Figures in parentheses are in percentage

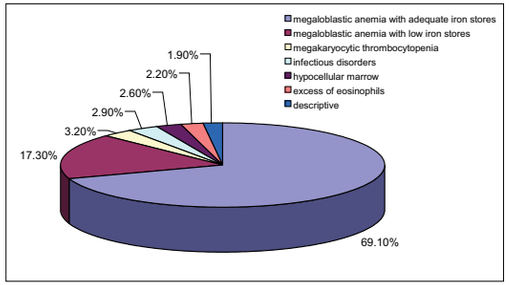

Figure 1: Non malignant haematological disorders (609 cases)

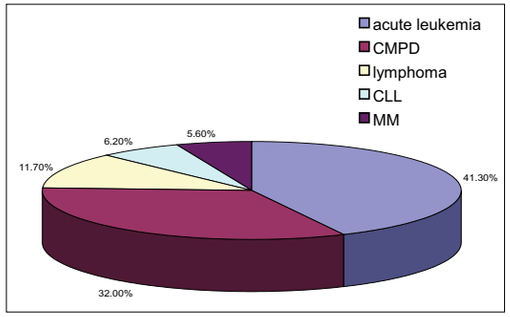

Figure 2: Malignant haematological disorders (133 cases)

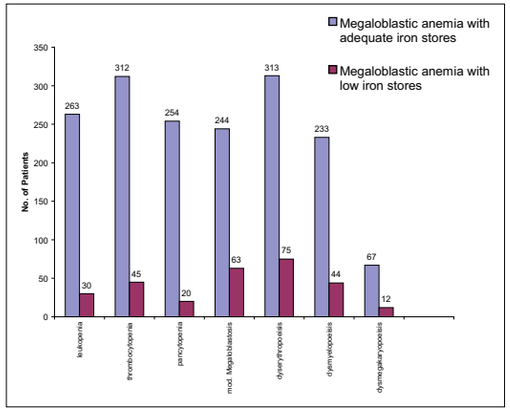

Figure 3: PBF & bone marrow findings in megaloblastic anemia

cytopenias in 42%, 26% and 18.5% cases respectively. Megaloblastosis of mild, moderate and severe degree was present in 18.8%,

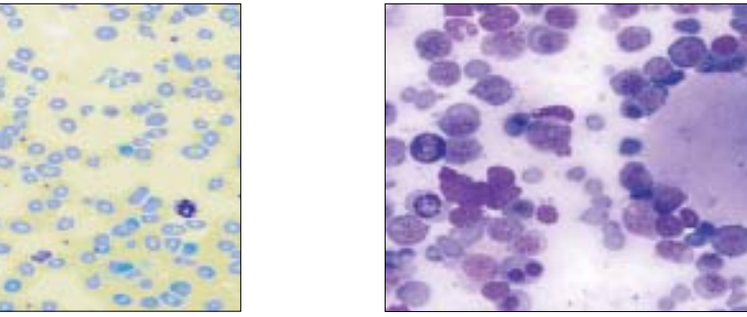

Figure 4: Photomicrograph of blood film showing oval macrocytes, anisocytosis, poikilocytosis, polychromatophils, nucleated RBC and hypersegmented neutrophil (Leishman, x 400)

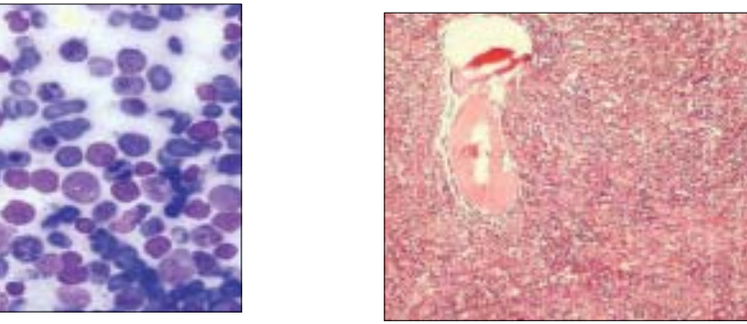

Figure 5: Photomicrograph of bone marrow aspirate showing megaloblasts, nuclear budding, dyserythropoiesisand mitotic figure (MGG, x 400)

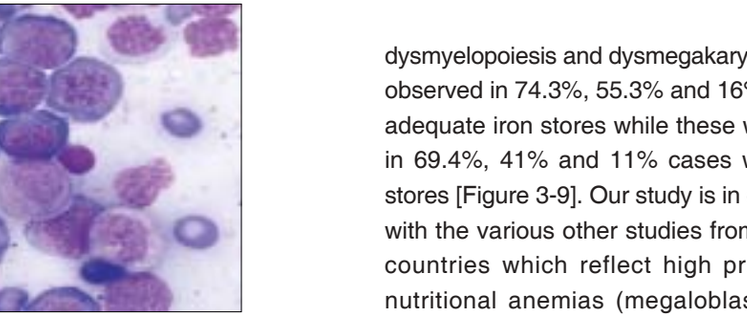

Figure 6: Photomicrograph of bone marrow aspirate showing megaloblasts with sieve like chromatin, giant myelocyte and giant metamyelocyte (MGG, x 1000)

58.1% and 23.7% cases with adequate iron stores as compared to 27%, 58% and 15% cases with low iron stores. Dyserythropoiesis,

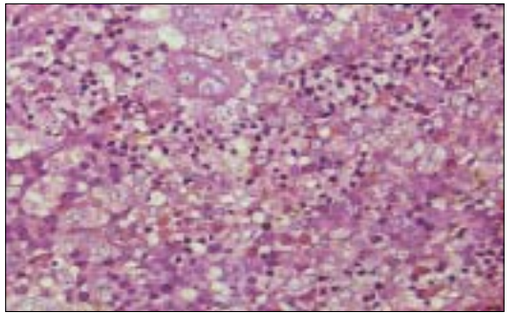

Figure 7: Photomicrograph of bone marrow aspirate showing megaloblasts, cytoplasmic budding, mitotic figures, giant metamyelocyte and dysmegakaryopoiesis (MGG, x 600)

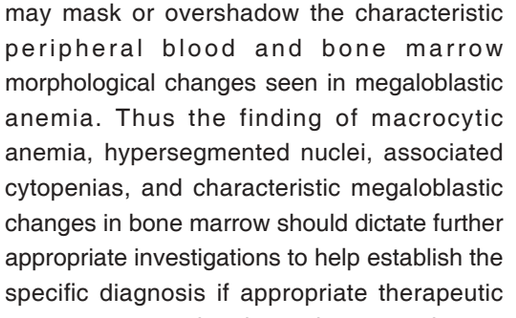

Figure 8: Photomicrograph of bone marrow trephine biopsy showing hypercellular marrow spaces (H&E, x 400)

dysmyelopoiesis and dysmegakaryopoiesis was observed in 74.3%, 55.3% and 16% cases with adequate iron stores while these were present in 69.4%, 41% and 11% cases with low iron stores [Figure 3-9]. Our study is in concordance with the various other studies from developing countries which reflect high prevalence of nutritional anemias (megaloblastic anemia, iron deficiency and mixed deficiency) among non pediatric population.[2,3] Organomegaly was present in a lower percentage of our cases as compared with Sarode *et al*.[4]

Co-existing iron deficiency (mixed deficiency)

Figure 9: Photomicrograph of bone marrow trephine biopsy showing scattered megaloblasts, myeloid cells and a megakaryocyte (H&E, x 400)

may mask or overshadow the characteristic peripheral blood and bone marrow morphological changes seen in megaloblastic anemia. Thus the finding of macrocytic anemia, hypersegmented nuclei, associated cytopenias, and characteristic megaloblastic changes in bone marrow should dictate further appropriate investigations to help establish the specific diagnosis if appropriate therapeutic investigation is to be ultimately instituted.

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