

Clinical and haematological parameters in adult AML patients: a four year experience at Nanakaly Hospital for blood diseases

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Abstract

Background and objectives: In adults, acute myeloid leukaemias constitute 80% of all acute leukaemia cases; its incidence progressively increases with age. To define the clinical and haematological parameters of adult acute myeloid leukaemia in Erbil City.

Methods: A painstaking analysis of hospital records of 94 adult patients with acute myeloid leukaemia was undertaken. The cases were diagnosed and managed at Nanakaly hospital during the years 2006-2009. Diagnosis was based on peripheral blood and marrow findings. The myeloid origin was confirmed by cytochemistry, and morphological subtyping was done according to the French-American-British (FAB) criteria. Microsoft excel version 2007 was employed for carrying out statistical analysis.

Results: The studied group included 58 males and 36 females (M: F = 1.6:1). Their ages ranged between 16 and 75 years with a mean age of 33.8 years. Pallor was the commonest presenting feature (70.2%) followed by bleeding (22.3%) then fever (7.5%). The mean value of Hb was (7.6) g/dl, WBCs ($34.5 \times 10^{-6}/L$), platelets ($39.6 \times 10^{-9}/L$); the percentage of blast cells in peripheral blood was 42.5% and in the bone marrow was 65.9%. AML-M2 was the most frequent FAB subtype 24.4%.

Conclusion: AML was commoner in males than in females (1.6:1). AML-M2 was the commonest FAB subtype. Pallor was the commonest presenting feature. Sudan black-B stain was a useful tool in the diagnosis of myeloid leukaemia.

Keywords: Acute myeloid leukaemia, FAB classification, clinical and haematological parameters.

Introduction

Acute myeloid leukaemia (AML) is a group of neoplastic blood disorders characterized by the proliferation and accumulation of immature haematopoietic cells in the bone marrow and blood. AML accounts for approximately 20% of acute leukaemias in children and 80% of acute leukaemia in adults.¹ The incidence of AML progressively increases with age; in adults over the age of 65 years, the incidence is approximately 30 times the incidence of AML in children.² The underlying pathophysiology in acute myeloid leukaemia (AML) consists of a maturational arrest of bone marrow

cells in the earliest stages of development. The mechanism of this arrest is under study, but in many cases, it involves the activation of abnormal genes through chromosomal translocations and other genetic abnormalities.^{3,4} There has not been any previous study addressing adult AML in Erbil City. Accordingly this study was designed with the intent of providing preliminary data on different haematological and clinical parameters of adult AML patients in Erbil City.

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Methods

Over a period of four years, from January 2006 to the end of December 2009, 94 adult patients were diagnosed as AML at Nanakaly hospital for haematological diseases in Erbil City. They were treated and followed up regularly at the same centre. This case-series study was conducted after approval from Nanakaly hospital's administration. Clinical and haematological data were obtained through reviewing their hospital records. In addition to personal information, data regarding presenting features, laboratory results of complete blood count (CBC) and marrow aspirate examination were recorded. There were 58 male and 36 females. All patients aged 16 and above were included. They were diagnosed depending on peripheral blood smear examination, bone marrow aspiration and cytochemistry. All cases had Sudan Black-B cytochemical analysis for confirming myeloid origin of marrow leukaemic cells. Morphological classification was done depending on FAB criteria. Results were statistically analyzed using Microsoft Excel, 2007 Office Edition.

Results

Over four years, 94 adult patients were diagnosed as AML, of them 58 were males and 36 were females (M:F ratio 1.6:1). The age of studied patients ranged between 16 and 75 years with a mean age (\pm SD) of 33.8 ± 21.3 years. Age distribution showed a major peak between 16 and 20 years where more than 40% of the cases (38 patients) had the disease. The number of cases then declined after the age of 30 years but started again a placid raising after the age of 40 years. The age and gender distribution of cases is illustrated in Figure (1). The mean values, standard deviation and ranges of age and different haematological parameters are shown in Table (1). AML-M2 was the commonest sub type (23 patients – 24.5%) followed by AML-M3 (22 patients – 23.4%), while only one case AML-M6 was diagnosed Table (2). Pallor was the most frequent presenting feature (66 patients – 70%) followed by bleeding (21 patients – 22%), fever was the presenting feature in seven patients. Twenty-four AML cases were registered in 2006; similar number of new AML cases were diagnosed in 2007, 32 in 2008 and 14 in 2009 Figure (2).

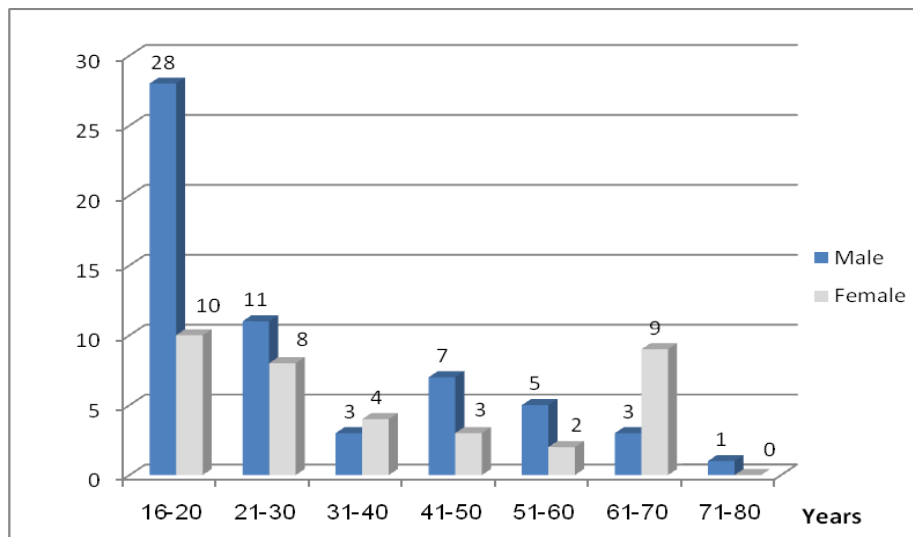


Figure1: Age and gender distribution of studied patients.

Table1: Summary of age and different hematological parameters of studied patients

Parameters	Mean	SD	Range
Hb (g/dl)	7.64	1.84	3.8-13.3
WBCs (x 10 ⁶ /L)	34.546	39.015	2.700-193.000
Platelets (x 10 ⁹ /L)	39.963	43.709	5.000-250.000
Blast cells in peripheral blood (%)	42.49	25.79	4-97
Blast cells in bone marrow (%)	66	20.90	24-93
Age (Years)	34	17.97	16-75

Table2: Means of age and main haematological parameters in the AML subtypes

FAB Subtype (No.)	Age (yr)	Haemoglobin (g/dl)	WBCs (x 10 ⁶ /L)	Platelets (x 10 ⁹ /L)	Blasts in PB (%)	Blasts in BM (%)
M0* (2)	32.5	8	2.7	59	37	90
M1 (20)	33.6	8.5	43	40	43	85
M2 (23)	40.5	7.7	27	40	43	66
M3 (22)	33.4	7	36	28	49	51
M4 (15)	32.7	8.1	67	47	37	54
M5 (5)	47.6	8.1	45	33	28	58
M6 (1)	21	7.4	20	43	72	69
M7* (6)	29.2	6.2	36	29	30	53

WBCs = While blood cells
row

PB = Peripheral Blood,

BM = Bone Mar-

* Presumptive diagnosis

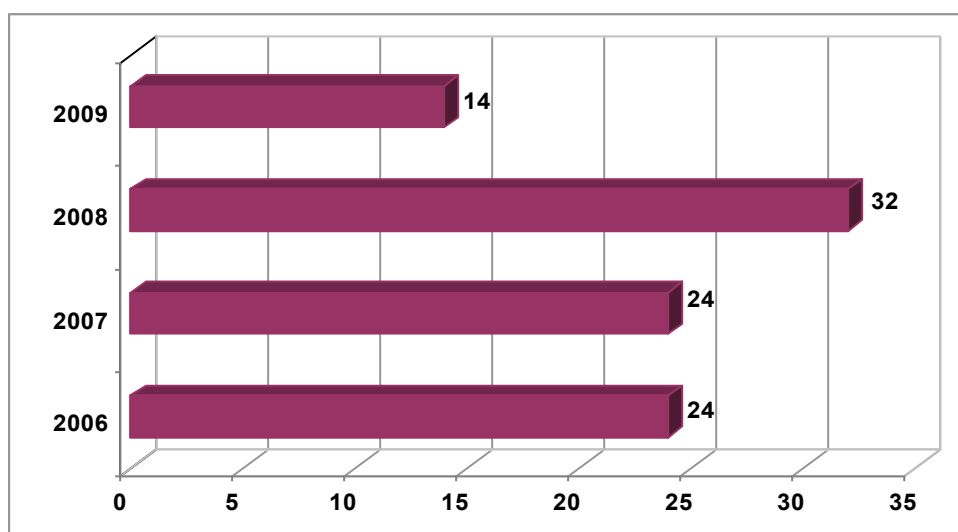


Figure 2: Newly diagnosed AML cases per year.

Discussion

Nanakaly hospital for blood diseases is the main and only center in Erbil governorate that receives and manages different types of benign and malignant haematological diseases. Acute myeloid leukaemias are a group of heterogeneous disorders with respect to morphologic, immunophenotypic and cytogenetic features. The recent WHO classification has stressed on the importance of cytogenetic abnormalities and multilineage dysplasia in the subtyping of leukaemias. Facilities for chromosomal studies are not readily available in our country. Therefore, FAB classification based on morphology, cytochemistry and immunophenotyping remains extremely useful in reaching the correct diagnosis.

Most of previous studies had reported a higher incidence of AML in males although the male predominance is not as distinct as in ALL.^{5,6} In our series, a male preponderance was also present, with a male to female ratio of 1.61:1.0. However, a study conducted in Brazil showed female preponderance of 1.6-1.0.⁷ The mean age at presentation was 33.8 (range 16-75 years) which is lower than that reported by the western countries⁸, but very close to that reported by Ghosh et al in india in

2003⁹ and Al-Allawi et al who studied AML patients in Baghdad in 1991.¹⁰ In our study the mean values of Hb, WBC and platelet counts were similar to that reported by Borowitz et al¹¹ and Weinberg et al.⁸

The commonest AML subtype in our series was AML-M2, which accounted for 23 cases (24% of all subtypes). This was slightly lower than the frequency of 27-29% which was reported in other studies.^{5, 8, 9} Similarly, Al-Allawi et al and Advani et al have observed a higher frequency of AML-M2 in both pediatric and adult population in India.^{10,12,13} The proportion of AML-M4 in the current series was 15.9% which is quite comparable to the figures (16-25%) reported in India and the UK by Bhatia et al, Ghosh et al, Advani et al, and Greaves.^{5,9,12,14} Only one case of M6 and two cases of M0 were reported in our study. The diagnosis of AML-M0 and AML-M7 remained presumptive upon morphological examination of peripheral blood and/or bone marrow smears, because they are negative for Sudan-B Black and their confirmation would require immunophenotyping. AML-M3 was relatively higher than what is reported from the western countries; similar results were reported by Al-Allawi et al in Baghdad.¹⁰ The majority of our patients presented with pallor

and fatigue. However, most patients with promyelocytic leukaemias (M3) presented with bleeding, both mucosal and cutaneous. This is consistent with results of Ghosh et al in India.⁹ There was a marked decline in the frequency of the newly registered AML cases in 2009 comparing to numbers of the registered cases in the previous three years. This is because a considerable number of haematology cases residing in Suleimaniyah governorate and its surroundings areas who were managed at Nanakaly Hospital in Erbil began attending "Hiwa Hospital", the new haematology-oncology center in Sulaeimaniyah governorate, which geographically covers Suleimaniyah, Diyala, and part of Kirkuk areas in northern part of Iraq.

Conclusion

AML was more common in males than in females (1.6:1). AML-M2 was the commonest FAB subtype. Pallor was the commonest presenting feature.

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