

Clinical and Laboratory Profiles of 109 Patients diagnosed as Multiple Myeloma in Erbil City.

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Summary:

Background: Multiple myeloma is characterized by clonal expansion and accumulation of abnormal plasma cells in the bone marrow compartment. This study was conducted to determine the frequency and hematological presentation of multiple myeloma in Nanakaly Hospital in Erbil city.

patients and Methods: This descriptive retrospective study was carried out at Nanakaly Hospital over a period of six years from January 2007 to August 2012. A total of 109 patients who were diagnosed with multiple myeloma all were included to analyze the clinical and laboratory profiles. All patients were selected based on preset diagnostic criteria by the WHO.

Results: The study showed a male: female ratio of 1:1.1, the mean age of male patients was 57.8 years and for females were 57.9. Backache was the most frequent presentation (41.28%) of the patient then bone pain (33.94%), followed by pallor (10.1%) and bone mass (9.2%). The hematological findings showed anemia in 72% patients. Forty five percent of the bone marrow nucleated cells were plasma cells.

Conclusions: Males are affected equally to females by multiple myeloma. Majority of patients present with backache, bone pain and anemia.

Key words: Multiple myeloma, Hematological and biochemical parameters, Nanakaly Hospital.

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Introduction

Multiple myeloma (MM) is a B cell neoplasm of the bone marrow with a complex array of clinical manifestations including anemia, bone lesions, hypercalcemia, renal dysfunction, and compromised immune function¹. It accounts for 10%–15% of all hematologic malignancies, and 20% of deaths related to cancers of the blood and bone marrow^{2, 3}. The diagnosis of MM is based on the presence of neoplastic plasma cells in the bone marrow or other extramedullary sites, along with evidence of disease-related organ dysfunction^{1, 3} and presence of M band on serum protein electrophoresis. Although the disease remains incurable, significant advances in both basic and translational research have enhanced understanding of disease pathogenesis and guided the development of new and more effective therapies^{1, 2}. The purpose of this review is to study the clinical presentations, hematological, biochemical and radiological profiles of proven patients of multiple myeloma from Erbil, since to date, there is no published report on such data.

Subjects and Method

A retrospective study of 109 patients diagnosed as multiple myeloma in Nanakaly Hospital for Blood Diseases in Erbil city from 2007 to 2012 were carried out to analyze the clinical and laboratory profiles.

Each case record was carefully reviewed and analyzed for the following: 1. Clinical data (age and sex); 2. Hematological profile (including hemoglobin, total white blood cell count, platelet count, erythrocyte sedimentation rate, and bone marrow aspirate and trephine findings), 3. Biochemical profile (including serum calcium, blood urea, serum creatinine, serum protein, serum albumin, serum globulin and paraprotein), and 4. Radiological findings. The paraproteins were measured using architect c 3000 made in USA machine fully automated (the measurement is done by immunoturbidometric method and the normal reference range was; IgG 5.4-18.2 g/l, IgA 0.63- 4.84 g/l, IgM 0.22-2.93 g/l, IgE <200). All the patients were selected based on diagnostic criteria of WHO⁴.

Diagnostic criteria for plasma cell myeloma

- Symptomatic plasma cell myeloma
- M-protein in serum and urine
- Bone marrow clonal plasma cells
- Related organ or tissue impairment e.g (CRAB: (hypercalcemia, renal insufficiency, anemia and bone lesions)) or myeloma related symptoms (hyperviscosity and recurrent infection) All patients were staged according to Durie and Salmon staging^{5, 6}. Data analysis were carried out by multiple comparison using computer statistical analysis software (SPSS 18), differences were considered as statistically significant at P<0.05.

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Results

The age range was from 27 to 81 years and the mean age was 57.8 years (SD ±12.4). The mean age of males was 57.8(SD ±12.4) while for females was 57.9 (SD ±12.3). Males and females were affected almost equally (male to female ratio 1:1.1). The age and sex distribution is shown in figure 1.

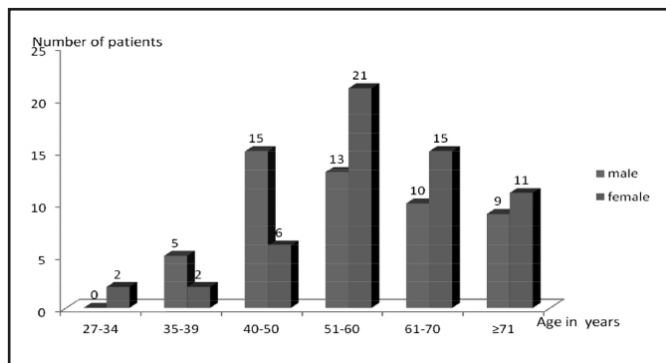


Fig 1: Age and sex distributions of the studied patients.

Backache was the most frequent presentation (41.28%) of the patients then bone pain (33.94%), followed by pallor (10.1%) and bone mass (9.2%), as displayed by figure 2.

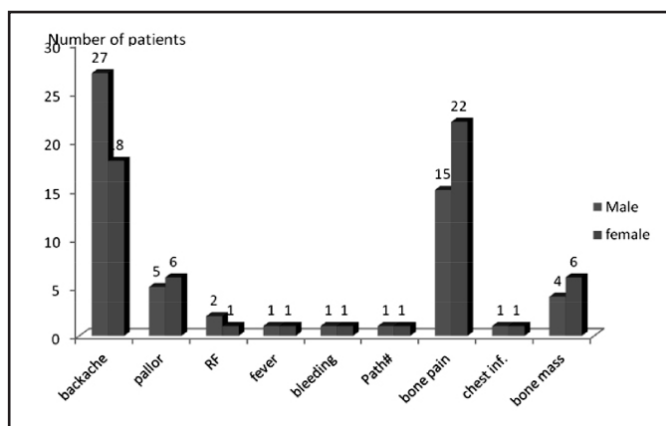


Fig 2: presenting features of the studied cases.

Radiological evaluation by plain X-ray of skull, vertebral column, pelvis and extremities showed that 85(77.98%) patients having lytic lesions and 16 (14.67%) patients were osteopenia and 8(7.33%) had apparently normal X-rays. Compressed vertebra was present in 5(4.58%) patients. The patients were staged according to Durie and Salmon staging, 45% of the patients were in stage III (20.2% male and 24.8% female), while 28% patients were in stage I (11.5% male and 16.5% female) and 27% patients were in stage II (15.6% male and 11.4 % female) as shown in figure 3.

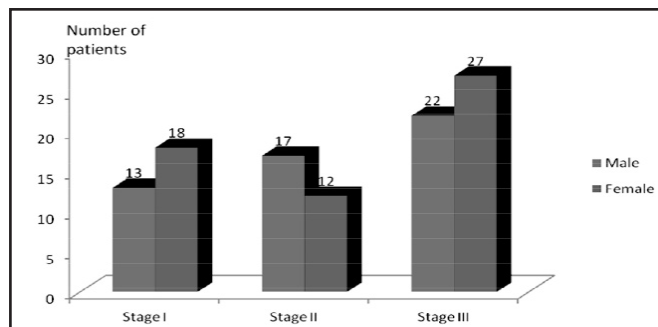


Figure 3: Durie & Salmon staging for the studied patients.

The patients were classified according to the types of paraproteins, and the majority of the patients were of IgG types (68.8% of patients, 75 out of 109 patients). Regarding the male patients; 37 of them were of IgG type (34%), 9 of them were of IgA myeloma (8.2%), 2 of them were of light chain myeloma (1.8%) and 4 (3.7%) patients were non-secretory myeloma; while for female patients 38 (34.8%) of them were of IgG type, 7 (6.5%) of them were of light chain myeloma, 8 (7.3%) of them were of IgA type and 4 (3.7%) patients were non-secretory myeloma, figures 4 and 5.

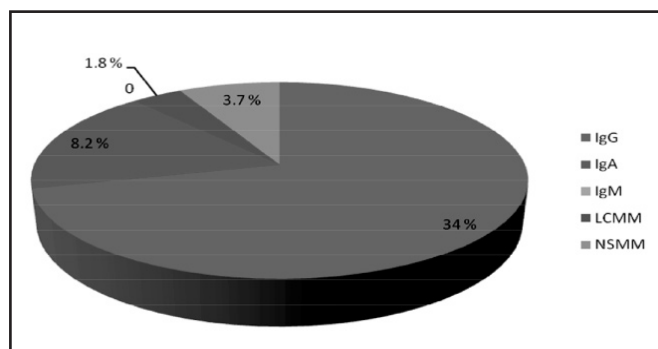


Figure 4: Types of myeloma among 52 male patients

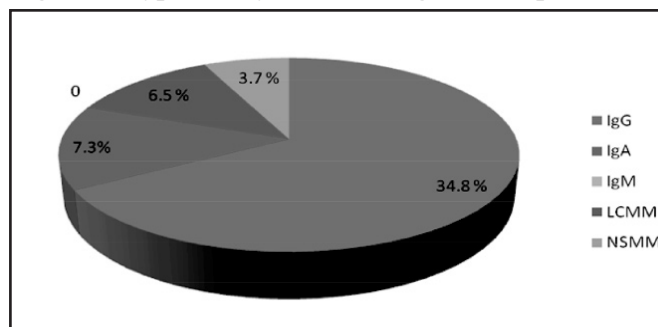


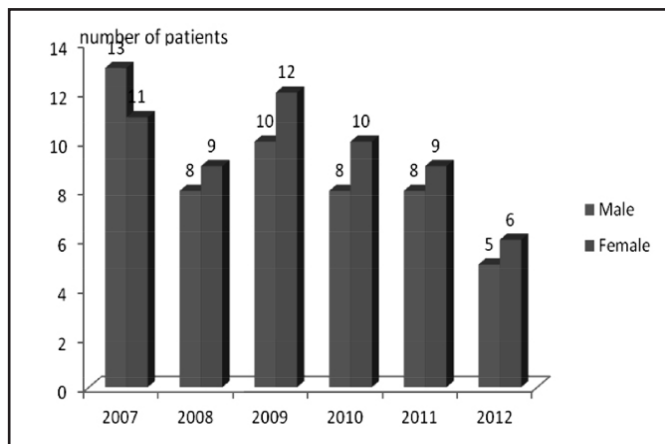
Figure 5: Types of myeloma among 57 female patients

Anemia was found in 72% of the patients. There was no significant difference between male and female patients as far as the hematological and biochemical parameters. The mean of erythrocyte sedimentation rate was 109 mm/1sthr. The mean of plasma cells in marrow was 45% of marrow nucleated cells. The mean of serum creatinine level was 1.9 mg/dl and the mean of blood urea level was 67.3 mg/dl, table 1.

Table 1: Summary of clinical, hematological and biochemical parameters of studied patients:

PARAMETERS	MALE			Female			P-Value
	Mean	Range	SD	Mean	Range	SD	
AGE year	57.8	35-81	12.4	57.9	27-80	12.3	NS
Hb g/dl	9.2	5.6-16.8	2.2	9.22	3.4-14.1	2.24	NS
ESR mm/hr	109	8-152	40.4	109	20-180	40.0	NS
WBC count X103/ mm3	8.12	3.5-40	5.2	7.79	2.9-25	5.11	NS
PLATELETS count X103/ mm3	217	80-490	108	219	32-420	107	NS
BL. UREA mg/dl	70.4	20-220	58.0	64.2	20-200	41.37	NS
S. CREATININE mg/dl	1.96	0.5-4.7	1.56	1.94	0.5-7.8	1.55	NS
S. Ca mg/dl	9.6	8-13	1.8	9.72	5.8-12.0	1.27	NS
T. PROTEIN g/dl	8.9	5.3-15.4	1.79	8.8	5.6-13.8	1.78	NS
ALBUMIN g/dl	3.33	2.2-4.3	0.54	3.32	2.3-4.4	0.54	NS
GLOBULIN g/dl	5.64	2.4-12.3	1.92	5.62	2.0-11.59	1.93	NS
BM. PLASMA CELLS %	45	3-90	24.0	45	5-90	24.0	NS

Out of 109 patients 22% of them were diagnosed in 2007, while 15.6% patients were diagnosed in 2008, 20.2% were diagnosed in 2009, 16.5% patients were diagnosed in 2010, 15.6% patients were diagnosed in 2011 and 10.1% patients were diagnosed in 2012, figure 6.

**Figure 6: Number of diagnosed patients per year**

Discussion

The mean age of patients in this study was 57.8 years with the range of (27–81) years, although there have been reported patients of multiple myeloma affecting patients less than 40 years of age, this is relatively uncommon. The peak incidence reported was from 50 to 70 years 1, 7, 8, 9. The mean age of 57.8 years in our series therefore falls within this range. The present study did not show a male or female preponderance but some larger studies showed a slight male preponderance 7, 10, 15. Backache and bone pain were the commonest symptoms, and were seen in 45 (41.28%).

and 37 (33.94%) patients respectively. Bony mass was found in 8(9.2%) and only 3(2.7%) had extraosseous soft tissue masses as part of their clinical evaluation. This agrees with the results in other series 7, 11. Roodman estimated that approximately 60% of patients have bone pain at the time of myeloma diagnosis and 90% of patients develop bone lesions during their disease course 7, 10, 11, 19. Pallor was the most frequent sign (11 patients 10.1%) detected in our patients, a finding that was in keeping with other reported studies 7, 11, 12, 13. Anemia was found in the majority of our patients, 72% of the patient in this series was found with anemia and 45% of them presented with Hb levels of less than 8.5 gm/dl which included in stage III of Durie and Salmon staging. In contrast, Kyle 7 has found only 8% of his patients with anemia. When the patients were staged according to Durie and Salmon Staging System, the majority were in stage III (49 patients) mostly due to anemia (Hb < 8.5 gm/dl), followed by stage I (31 patients) and stage II (29 patients). We think the main reasons for anemia predominance is the late presentation to hematologist/oncologist clinics since they only sought medical attention after they developed backache and bone pain and were referred to us by orthopedics clinics. Durie–Salmon staging (1975) is the most commonly used system for patients with multiple myeloma. It has proven to be an effective system of patient stratification for clinical trial research. However, the criteria are complex and many laboratory parameters are required to properly stage patients 4, 6, 14. The mean of erythrocyte sedimentation rate (ESR) was 109 (±40) mm/1st hr in our patients. Kyle 7 found 76% of his patients with ESR more than 50 mm/1st hr. The mean of ESR was more than 70 mm/1st hr in more than 70% of patients in a study

done by Wong 16. Bone marrow aspiration and trephine biopsies were done for all patients in the sample. The mean of plasma cells percent in marrow was 45%. Wong reported that out of 34 patients of multiple myeloma 26 of them had more than 30% plasma cells in their bone marrow 16. The most commonly occurring paraprotein type is IgG, followed by IgA and light-chain myelomas 7, 17, 18. Our results showed 75 patients with IgG myeloma, 17 patients with IgA and 9 patients with light chain myeloma. Wang found IgG myeloma in 56% patients and IgA myeloma in 25% patients 16. This finding was also reported by Kyle 7. The variation of IgA and light chain myeloma in our series may be due to racial and environmental variations or may be due to small size sample. Serum creatinine level and blood urea level were raised in our series. The mean of serum creatinine level was 1.9 mg/dl and mean of blood urea level was 67.3 mg/dl. In Kyle's series 7, 54% and 56% of males and females respectively had raised serum creatinine. High blood urea was found in 41 % of Kapadia's series 11. The number of diagnosed patients with multiple myeloma has decreased from 2007 to 2012; it seems that establishment of another hematological center in Sulaimanya in 2008 played a role in decreasing the number of referred patients to Nanakaly hospital in Erbil City. In conclusion, males and females are affected equally by multiple myeloma. Majority of patients present with anemia backache and bone pain and IgG myeloma was the commonest type.

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