Results

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The work of this study was conducted in National Cancer Institute (NCI), Cairo University, including 45 patients suffering from acute myeloid leukemia (AML) who were recently diagnosed and treated by one course induction remission 7 + 3 regimen of chemotherapy as discussed before in patients and methods, in addition to 10 normal persons as a control group.

I-Data obtained from the control group

Clinical data:

Ages: Ranged from 21 years to 43 with a mean of 32 ± 9 years.

Sex : 6 were males (60 %) and 4 were females (40 %).

Symptoms and signs : Absent.

Laboratory data:

A-Complete blood picture (table 16):

Hemoglobin level: Ranged from 12.6 to 14.7 with a mean of 13.1 ± 4.9 gm/dl.

Red blood corpuscles count: Ranged from 4.73 to 5.91 with a mean of 5.12 ± 1.7 millions/ml.

Total leucocytic count: It ranged from 4.7 to 8.1 with a mean of 5.3 ± 1.54 thousands/ml.

Platelets count: Ranged from 212 to 389 with a mean of 317 ± 95 thousands/ml.

Blast cells in peripheral blood: Absent.

B-Bone marrow examination:

Blast cells in bone marrow: Absent (table 16).

Normoblasts: Ranged from 3 to 30% with a mean of 14 ± 8.1%.

Lymphocytes: Ranged from 5 to 22% with a mean of 16 ± 7.3%.

Neutrophils: Ranged from 6 to 25% with a mean of 17.9 ± 9.2%.

Esinophils: Ranged from 0.3 to 2.7% with a mean of 1.7 ± 0.9%.

Basophils: Ranged from 0.1 to 0.8% with a mean of 0.4 ± 0.2%.

Promyelocytes: Ranged from 0.3 to 3.9% with a mean of 2.4 ± 1.7%.

Metamyelocytes: Ranged from 9 to 27 with a mean of 23 ± 13%.

Polymorphnuclear leucocytes: Ranged from 9 to 24 with a mean of 19 ± 11.4%.

Monocytes: Ranged from 0.0 to 0.2 with a mean of 0.1 ± 0.1%.

Megakaryocytes: Ranged from 0.2 to 0.9 with a mean of 0.5 ± 0.3%.

C-Other laboratory data (Table 17):

Interleukin 6 (IL-6): Ranged from 5.3 to 8.2 with a mean of 6.1 ± 0.9 ng/ml.

Interleukin 8 (IL-8): Ranged from 1.1 to 4.2 with a mean of 2.6 ± 0.9 ng/ml.

Tumor necrosis factor alpha (TNF-α): Ranged from 20.2 to 45.1 with a mean of 32.1 ± 8.5 ng/ml.

Soluble Fas (sFas): Ranged from 513 to 812 with a mean of 711.2 ± 106.3 pg/ml (table **17**).

II-Data obtained from the study group

I- At patient's presentation:

Clinical data:

Prevalence of AML according to age (table 13 & figure 10): Patients aged 30 years or less accounted for 48.9 % (22 cases out of 45), on the other hand, the percentage of AML patients older than 30 years was 51.1% (23 cases out of 45). No statistical significance was found between males and females ($P > 0.05$).

Percentage of males and females in the study group (table 13 & figure 11): The males and females percentage were 53.3% and 46.7% respectively signifying slight males predominance comparing to females.

Performance status in AML patients (table 13 & figure 12): 34 cases (75.6 %) presented with performance status I, and 11 cases (24.4 %) presented with performance status 2. On the other hand, there were no available cases presented with performance status 0, 3, or 4.

Age and performance status (table 15): Performance status 1 contained 34 cases, 17 of them (50%) had ages ≤ 30 years and 17 (50 %) had ages > 30 years. On the other hand, performance status 2 included 11 cases, 5 of them (45.4%) had ages ≤ 30 years and 6 (54.6%) had

ages > 30 years. No statistical differences could be elicited regarding age between performance status 1 and 2 (Chi = 4.5, P > 0.05).

Sex and performance status (table 15): Performance status 1 included 34 cases, 18 of them (52.9%) were males and 16 (47.1%) were females. On the other hand, performance status 2 contained 11 cases, 6 of them (54.6%) were males and 5 (45.4%) were females. No statistical significance could be noticed between performance status 1 and 2 regarding sex (Chi = 4.1, P > 0.05).

Percentage of fever, purpura, lymphadenopathy, sternal pain and tenderness, weight loss, pallor, and splenomegaly in study group (table 14 & figure 13): Pallor was noticed in 44 cases out of 45 (97.8%) which occupied the main presenting features, followed by sternal pain and tenderness in 30 cases (66.7%), then fever in 25 cases (55.6%), purpura in 23 cases (51.1%), lymphadenopathy in 16 cases (35.6%), weight loss in 14 cases (31.1%). On the other hand, splenomegaly was only seen in 6 cases (13.3%).

Laboratory data:

A-Complete blood picture:

Hemoglobin level (table 16): Ranged from 4.6 to 10.4 with a mean of 6.9 ± 3.1 gm/dl which is statistically lower than that of control (P < 0.05). 21 cases (46.7%) presented with hemoglobin level ≤ 8 gm/dl and 24 cases (53.3%) presented with hemoglobin level > 8 gm/dl.

Red blood corpuscles (table 16): Ranged from 1.2 to 3.9 with a mean of 2.1 ± 1.5 millions/ml which is statistically lower than that of control group (P < 0.05).

Total leucocytic count (TLC) (table 16): Ranged from 3.3 to 89.1 with a mean of 42.7 ± 20.5 thousands/ml which is significantly higher than that of control group ($P < 0.05$). According to total leucocytic count, patients were divided into, patients with TLC < 5 thousands/ml accounted for 4.4% (2 cases out of 45), those with TLC from 4 to 30 thousands/ml represented 51.2% (23 cases), and those with TLC > 30 thousands/ml amounted to 44.4% (20 cases).

Platelets count (table 16): Ranged from 12 to 153 with a mean of 66.7 ± 35.9 thousands/ml which is statistically lower than that of control group ($P < 0.05$). 22 cases (48.9%) presented with platelets count ≤ 50 thousands/ml, whereas, 17 cases (37.8%) had count from 50 to 100 thousands/ml, and 6 (13.3%) had count > 100 thousands/ml.

Blast cells percentage in peripheral blood (table 16): Ranged from 8% to 83% with a mean of 48.3 ± 32.7% which is significantly higher than that of control group ($P < 0.05$). 20 cases (44.4%) presented with blast cells ≤ 30%, whereas 25 cases (55.6%) had blast cells > 30%.

B-Bone marrow examination:

Blast cells percentage (table 16): Ranged from 18 to 97% with a mean of 51.7 ± 29.6% which is statistically higher than that of control group ($P < 0.05$). 7 cases (15.5%) presented with blast cells ≤ 30% whereas 38 cases (84.5%) had blast cells > 30%.

Normoblasts percentage: Ranged from 1% to 59% with a mean of 27.6 ± 18.9% which is statistically higher than that of the controls ($P < 0.05$).

Lymphocytes percentage: Ranged from 1% to 33% with a mean of 18.4 ± 7.9%. No statistical differences could be observed in comparison with that of control group ($P > 0.05$).

Neutrophils percentage: Ranged from 1% to 49% with a mean of 29.5 ± 18.2% which is statistically higher than that of controls ($P < 0.05$).

Prevalence of different FAB subtypes in the study group: As shown in table 18 & figure 15 which revealed the following:

- FAB subtype M1 was observed in 10 cases (22.2%).
- FAB subtype M2 was seen in 12 cases (26.6%).
- FAB subtype M3 was noticed in 9 cases (20.0%).
- FAB subtype M4 was recorded in 7 cases (15.6%).
- FAB subtype M5 was found in 7 cases (15.6%).
- M0, M6, and M7 were not recorded due to no availability of their patients during the period of study.

Sex and FAB subtypes (table 18 & figure 16):

-FAB subtype M1 consisted of 8 males (80%) and 2 females (20%).

-FAB subtype M2 contained 6 males (50%) and 6 females (50%).

-FAB subtype M3 comprised 4 males (44.4%) and 5 females (55.6%).

-FAB subtype M4 consisted of 4 males (57.1%) and 3 females (42.9%).

-FAB subtype M5 contained 2 males (28.6%) and 5 females (71.4%).

Statistical comparison regarding to the different FAB subtypes showed no significant differences between males and females ($Chi = 4.9$, $P > 0.05$).

FAB subtypes and age (table 19): Those with ages ≤ 30 years included 22 cases, M1 was presented in 6 cases (27.3 %), M2 in 6 (27.3 %), M3 in 3 (13.6 %), M4 in 3 (13.6 %), and M5 in 4 (18.2 %). On the other hand, those with ages > 30 years included 23 cases, M1 was observed in 4 cases (17.4%), M2 in 6 (26.1%), M3 in 6 (26.1%), M4 in 4 (17.4%), and M5 in 3 (13 %). Statistical comparison between the two age groups regarding to FAB subtypes distribution was insignificant (Chi = 6.3, P > 0.05).

FAB subtypes and purpura (table 19): Patients presented with purpura included 23 cases, M1 was observed in 6 (26.1%), M2 in 6 (26.1%), M3 in 7 (30.4%), M4 in 2 (8.7%), and M5 in 2 cases of them (8.7%). On the other hand, in absence of purpura, M1 was noticed in 4 cases out of 22 (18.2%), M2 in 6 (27.3%), M3 in 2 (9.1%), M4 in 5 (22.7%), and M5 in 5 cases (22.7%). Distribution of FAB subtypes in patients with purpura comparing to those without purpura showed no significant changes (Chi = 5.7, P > 0.05).

Blast cells percentage in bone marrow of study group at presentation and FAB subtypes (table 20 & figure 17): Blast cells in M1 ranged from 24% to 97% with a mean of 72.1 ± 26.8%, in M2 ranged from 40% to 85% with a mean of 56.1 ± 16.9%, in M3 ranged from 15% to 45% with a mean of 25.8 ± 11.9%, in M4 ranged from 20% to 49% with a mean of 31.8 ± 10.3%, and in M5 ranged from 18% to 96% with a mean of 41.4 ± 33.3%. Blast cells percentage in bone marrow revealed statistical differences among different FAB subtypes, where the highest percentage was observed in M1 and the lowest was noticed in M3 (Chi = 2.1, P < 0.05).

C-Other laboratory data:

1-Interleukin 6 (IL-6) at presentation:

Interleukin 6 ranged from 4.2 to 36 with a mean of 13.2 ± 8.8 ng/ml which is statistically higher than that of the control (t = 87.5, P < 0.05) (table 17 & figure 14).

Interleukin 6 and sex (table 22 & figure 19): In males, IL-6 level ranged from 4.2 to 20.3 with a mean of 10.7 ± 5.7 ng/ml. Whereas in females, it ranged from 4.4 to 36 with a mean of 16.1 ± 10.8 ng/ml. No statistical significance could be observed between males and females (Chi = 2.7, P > 0.05).

Interleukin 6 and performance status (table 22): In patients with performance status 1, IL-6 level ranged from 4.2 to 36 with a mean of 13.6 ± 9.7 ng/ml. On the other hand, those with performance status 2 had IL-6 ranged from 5.2 to 20.2 with a mean of 12.2 ± 5.6 ng/ml. Statistical comparison revealed no significant differences between the two groups (t = 178, P > 0.05).

Interleukin 6 and fever (table 22): IL-6 level in patients with fever ranged from 4.2 to 36 with a mean of 13.9 ± 8.3 ng/ml, while in absence of fever, it ranged from 4.4 to 33.5 with a mean of 12.3 ± 9.4 ng/ml. No statistical significance was found between patients with and those without fever (t = 189, P > 0.05).

Interleukin 6 and purpura (table 23): In presence of purpura, IL-6 level ranged from 4.4 to 20.3 with a mean of 17.1 ± 10.2 ng/ml. On the other hand, in absence of purpura, it ranged from 4.2 to 36 with a mean of 9.5 ± 5 ng/ml. Statistical comparison indicated that

the level of IL-6 in patients with purpura is significantly higher than those without purpura ($t = 146$, $P < 0.05$).

Interleukin 6 and lymphadenopathy (table 23): Patients with lymphadenopathy had IL-6 level ranged from 4.8 to 20.2 with a mean of 11.2 ± 5.7 ng/ml. Whereas, those without lymphadenopathy had IL-6 level ranged from 4.2 to 36 with a mean of 14.4 ± 10.1 ng/ml. Statistical comparison between the two groups elicited no significant changes ($t = 201$, $P > 0.05$).

Interleukin 6 and splenomegaly (table 23): Patients with splenomegaly had IL-6 level ranged from 5.2 to 12.3 with a mean of 11.3 ± 5.7 ng/ml. While those without splenomegaly had IL-6 level ranged from 4.2 to 36 with a mean of 14.2 ± 9.0 ng/ml. No statistical differences could be elicited between patients with and those without splenomegaly ($t = 163$, $P > 0.05$).

Interleukin 6 and FAB subtypes (table 21 & figure 18): IL-6 in M1 ranged from 6.8 to 16.9 with a mean of 10.7 ± 4.4 ng/ml, in M2 ranged from 4.2 to 36 with a mean of 10.6 ± 6.9 ng/ml, in M3 ranged from 4.4 to 20.3 with a mean of 9.4 ± 6.3 ng/ml, in M4 ranged from 14.7 to 20.4 with a mean of 17.5 ± 2.5 ng/ml, and in M5 ranged from 9.6 to 33.5 with a mean of 21.9 ± 9.9 ng/ml. Statistical comparison showed that there are significant changes in IL-6 level among the various FAB subtypes (Chi = 16, $P < 0.05$), where the highest IL-6 level was observed in M5 and the lowest was found in M3.

Interleukin 6 and blast cells percentage in bone marrow at patients presentation (table 24 & figure 20): According to IL-6 level, the study group was divided into patients with IL-6 level ≤ 8.2 ng/ml and those with IL-6 > 8.2 ng/ml. The reason for this division based on

the fact that this level is equal to the maximum IL-6 level recorded in controls that is 8.2 ng/ml.

Patients with IL-6 level ≤ 8.2 ng/ml had blast cells percent ranged from 15% to 97% with a mean of 58.5 ± 25.9%, while patients with IL-6 > 8.2 ng/ml had blast cells ranged from 17% to 90% with a mean of 39.6 ± 24.6%. Statistical comparison elicited that blast cells percentage in patients with IL-6 ≤ 8.2 ng/ml is significantly higher than that in those with IL-6 > 8.2 ng/ml (t = 132, P < 0.05) (table 24 & figure 20).

2-Interleukin 8 (IL-8) at presentation:

Interleukin 8 ranged from 1.4 to 9.1 with a mean of 3.5 ± 1.6 ng/ml. No statistical differences could be observed between the study and control groups (t = 175, P >0.05) (table 17 & figure 14).

Interleukin 8 and sex (table 22 & figure 19): IL-8 level in males ranged from 1.5 to 5.3 with a mean of 3.0 ± 1.1 ng/ml. While in females, it ranged from 1.4 to 9.1 with a mean of 3.9 ± 1.9 ng/ml. Statistical comparison between males and females showed no significant differences (Chi = 1.32, P > 0.05).

Interleukin 8 and performance status (table 22): Patients with performance status 1 had IL-8 level ranged from 1.4 to 9.1 with a mean of 3.4 ± 1.6 ng/ml. On the other hand, those with performance status 2 had IL-8 level ranged from 1.7 to 6.4 with a mean of 3.6 ± 1.5 ng/ml. No statistical differences could be recorded between the two groups (t = 184, P >0.05).

Interleukin 8 and fever (table 22): IL-8 level in presence of fever ranged from 1.5 to 9.1 with a mean of 3.5 ± 1.6 ng/ml. On the other

hand, in absence of fever, it ranged from 1.4 to 6.4 ng/ml with a mean of 3.3 ± 1.5 ng/ml. Statistical comparison between patients with and those without fever could not elicit significant changes (t =234, P > 0.05).

Interleukin 8 and purpura (table 23): IL-8 level in presence of purpura ranged from 1.4 to 6.4 with a mean of 3.4 ± 1.3 ng/ml. Whereas in absence of purpura, it ranged from 1.6 to 9.1 with a mean of 3.6 ± 1.8 ng/ml. No significant changes could be noticed between patients with and those without purpura (t =244, P > 0.05).

Interleukin 8 and lymphadenopathy (table 23): In presence of lymphadenopathy, IL-8 level ranged from 1.7 to 5.3 with a mean of 3.3 ± 1.1 ng/ml. On the other hand, its level in absence of lymphadenopathy ranged from 1.4 to 9.1 with a mean of 3.5 ± 1.8 ng/ml. Statistical comparison between the two groups revealed no significant differences (t = 164, P > 0.05).

Interleukin 8 and splenomegaly (table 23): IL-8 level in presence of splenomegaly ranged from 1.6 to 6.3 with a mean of 3.2 ± 0.7 ng/ml. On the other hand, its level in absence of splenomegaly ranged from 1.4 to 9.1 with a mean of 3.5 ± 1.7 ng/ml. No significant changes could be noticed statistically between patients with and those without splenomegaly (t = 181, P > 0.05).

Interleukin 8 and FAB subtypes (table 21 & figure 18): IL-8 in M1 ranged from 2.2 to 3.7 with a mean of 3.0 ± 0.6 ng/ml, in M2 ranged from 1.9 to 4.2 a mean of 2.6 ± 1.1 ng/ml, in M3 ranged from 2.1 to 6.4 with a mean of 4.6 ± 1.5 ng/ml, in M4 ranged from 1.7 to 3.6 with a mean of 2.9 ± 0.8 ng/ml, and in M5 ranged from 2.2 to 9.1 with a mean of 4.4 ± 2.6 ng/ml. No statistical differences could be noticed among the various FAB subtypes (Chi = 10.2, P > 0.05).

Interleukin 8 and blast cells percentage in bone marrow at presentation (table 24 & figure 20 & 21): The study group was classified according to IL-8 level into patients with IL-8 $\leq$ 4.2 ng/ml and those with IL-8 > 4.2 ng/ml. Dependence on this level for classification is due to its equality to upper limit of IL-8 in controls that is 4.2 ng/ml.

Blast cells in patients with IL-8 $\leq$ 4.2 ng/ml ranged from 18% to 97% with a mean of 52.6 $\pm$ 26.3%. On the other hand, in patients with IL-8 > 4.2 ng/ml, it ranged from 15% to 45% with a mean of 24.4 $\pm$ 12.5%. There was significant higher blast cells percentage in patients with IL-8 $\leq$ 4.2 ng/ml compared to those with level > 4.2 ng/ml (t = 45, P < 0.05) (table 24 & figure 20).

3-Tumor necrosis factor alpha (TNF-α) at presentation:

Tumor necrosis factor alpha ranged from 15.2 to 88.9 with a mean of 51.9 $\pm$ 22.8 ng/ml which is statistically higher than that of controls (t = 87, P < 0.05) (table 17 & figure 14).

Tumor necrosis factor alpha and sex (table 22 & figure 19):TNF-α level in males ranged from 15.2 to 88.8 with a mean of 58.8 $\pm$ 22.0 ng/ml. On the other hand, in females, it ranged from 16.4 to 88.2 with a mean of 43.9 $\pm$ 21.7 ng/ml. Statistical comparison revealed significantly higher TNF-α level in males than females (Chi = 3.8, P < 0.05).

Tumor necrosis factor alpha and performance status (table 22): In patients with performance status 1, TNF-α level ranged from 16.4 to 88.8 with a mean of 55.1 $\pm$ 22.3 ng/ml. On the other hand, in those with performance status 2, TNF-α level ranged from 15.2 to 83.2 with a mean of 41.9 $\pm$ 22.9 ng/ml. No statistical differences could be obtained between the two groups (t = 174, P > 0.05).

Tumor necrosis factor alpha and fever (table 22): In presence of fever, TNF-α level ranged from 22.4 to 88.7 with a mean of 58.9 ± 20.3 ng/ml. Whereas, in absence of fever, it ranged from 15.2 to 83.2 with a mean of 43.1 ± 23.3 ng/ml. Statistical comparison showed that TNF-α level in patients with fever is significantly higher than those without fever ($t = 135$, $P < 0.05$).

Tumor necrosis factor alpha and purpura (table 23): TNF-α level in presence of purpura ranged from 18.4 to 88.7 with a mean of 55.6 ± 22.4 ng/ml. On the other hand, its level in absence of purpura ranged from 15.2 to 83.2 with a mean of 48.0 ± 23.2 ng/ml. No statistical significance could be noticed between patients with and those without purpura ($t = 212$, $P > 0.05$).

Tumor necrosis factor alpha and lymphadenopathy (table 23): Patients with lymphadenopathy had TNF-α level ranged from 15.2 to 86 with a mean of 44.2 ± 18.6 ng/ml. On the other hand, those without lymphadenopathy had TNF-α level ranged from 16.4 to 88.7 with a mean of 56.1 ± 24.2 ng/ml. It was noticed that TNF-α level in patients with lymphadenopathy is statistically higher than those without ($t = 112$, $P < 0.05$).

Tumor necrosis factor alpha and splenomegaly (table 23): TNF-α level in presence of splenomegaly ranged from 44.8 to 83.2 with a mean of 67.7 ± 17.9 ng/ml. While, its level in absence of splenomegaly ranged from 15.2 to 88.7 with a mean of 49.5 ± 22.8 ng/ml. No statistical differences could be recorded between the two groups ($t = 183$, $P > 0.05$).

Tumor necrosis factor alpha and FAB subtypes (table 21 & figure 18): TNF-α level in M1 ranged from 49.4 to 88.7 with a mean

of 70.4 ± 16.8 ng/ml, in M2 ranged from 44.8 to 80.3 with a man of 59.4 ± 11.5 ng/ml, in M3 ranged from 18.4 to 67.2 with a mean of 40.1 ± 18.1 ng/ml, in M4 ranged from 15.2 to 88.2 with a mean of 42.3 ± 31.1 ng/ml, and in M5 ranged from 16.4 to 69.1 with amean of 37.3 ± 22.6 ng/ml. Statistical comparison among the various FAB subtypes showed presence of significant differences (Chi = 14.9, $P < 0.05$), the highest TNF-α level was noticed in M1 whereas the lowest level was found in M5.

Tumor necrosis factor alpha and blast cells percentage in bone marrow at presentation (table 24 & figure 20): The study group was divided into patients with TNF-α ≤ 45.1 ng/ml and those with TNF-α > 45.1 ng/ml. Usage of this level is attributed to the fact of its equality to its maximum level in controls which is 45.1 ng/ml.

Patients with TNF-α ≤ 45.1 ng/ml had blast cells ranged from 15% to 90% with a mean of 35.5 ± 25.7%, on the other hand, patients with TNF-α > 45.1 ng/ml had blast cells ranged from 20% to 97% with a mean of 55.6 ± 24.5%. Statistical comparison revealed that patients with TNF-α > 45.1 ng/ml have higher blast cells percentage than those with TNF-α ≤ 45.1 ng/ml (t = 118, $P < 0.05$) (table 24 & figure 20).

4-Soluble Fas (sFas) at presentation:

Soluble Fas level ranged from 462 to 1698 with a mean of 955.4 ± 288.9 pg/ml which is statistically higher than that of controls (t = 85.5, $P < 0.05$) (table 17 & figure 14).

Soluble Fas and sex (table 22 & figure 19): In males, sFas level ranged from 462 to 1698 with a mean of 981.7 ± 312.6 pg/ml. Whereas in females, it ranged from 568 to 1590 with a mean 925.4 ± 263.6 pg/ml. No statistical differences between males and females could be elicited (Chi = 0.85, P > 0.05).

Soluble Fas and performance status (table 22): In performance status 1, sFas level ranged from 462 to 1698 with a mean of 983 ±305 pg/ml. Whereas, in performance status 2, it ranged from 568 to 1276 with a mean of 868 ± 219 pg/ml. Statistical comparison between the two groups revealed insignificant differences (t = 188, P > 0.05).

Soluble Fas and fever (table 22): In presence of fever, sFas level ranged from 462 to 1698 with a mean of 984 ± 343 pg/ml. On the other hand, its level in absence of fever ranged from 520 to 1352 with a mean of 918 ± 204 pg/ml. No statistical differences could be recorded between patients with and those without fever (t = 235, P > 0.05).

Soluble Fas and purpura (table 23): The level of sFas in presence of purpura ranged from 462 to 1698 with a mean of 1006 ± 339 pg/ml. While in absence of purpura, it ranged from 568 to 1276 with a mean of 902 ± 220 pg/ml. No statistical differences could be noted between patients with purpura and those without purpura (t = 207, P > 0.05).

Soluble Fas and lymphadenopathy (table 23): In presence of lymphadenopathy, sFas level ranged from 462 to 1276 with a mean of 891 ± 232 pg/ml. On the other hand, its level in absence of lymphadenopathy ranged from 520 to 1698 with a mean of 990 ± 313 pg/ml. Statistical comparison between the two groups showed insignificant differences (t = 220, P > 0.05).

Soluble Fas and splenomegaly (table 23): Patients with splenomegaly had sFas level ranged from 668 to 927 with a mean of 792 ± 192 pg/ml. Whereas, those without splenomegaly had sFas level ranged from 462 to 1698 with a mean of 980 ± 301 pg/ml. No statistical differences between patients with and those without splenomegaly could be observed (t = 171, P > 0.05).

Soluble Fas and FAB subtypes (table 21 & figure 18): The level of sFas in M1 ranged from 462 to 927 with a mean of 654 ± 138 pg/ml, in M2 ranged from 742 to 1409 with a mean of 1020 ± 220 pg/ml, in M3 ranged from 877 to 1698 with a mean of 1107 ± 261 pg/ml, in M4 ranged from 857 to 1590 with a mean of 1216 ± 270 pg/ml, and in M5 ranged from 643 to 1024 with a mean of 818 ± 186 pg/ml. Statistical comparison among the various FAB subtypes showed significant differences (Chi = 22.3, P < 0.05), the highest level of sFas was observed in M4 and the lowest level was seen in M1.

Soluble Fas and blast cells percentage in bone marrow at presentation (table 24 & figure 20 & 22): The patients were divided according to sFas level into patients with sFas ≤ 812 pg/ml and those with sFas > 812pg/ml, this level of sFas was used because it equals its maximum level in controls.

Patients with sFas level ≤ 812 pg/ml had blast cells ranged from 20% to 94% with a mean of 67.5 ± 29.1%. On the other hand, those with sFas > 812 pg/ml had blast cells ranged from 15% to 97% with a mean of 37.6 ± 18.9%. Statistical comparison showed that patients with sFas ≤ 812 pg/ml have higher blast cells percentage than those with sFas > 812 pg/ml (t = 100, P < 0.05) (table 24 & figure 20 & 22).

II –Two weeks after end of induction remission chemotherapy:

Response of AML patients to chemotherapy (table 25 & figure 23): 23 cases out of 45 (51.1%) achieved complete remission, whereas 18 cases (40 %) had partial remission and 4 cases (8.9%) died during the course of chemotherapy. The causes of death in these 4 patients were severe chest infection in 2 cases (50%), anemic heart failure in one case (25%), and severe bleeding tendency and purpura in the remaining case (25%).

Response to chemotherapy and sex (table 26): Complete remission was observed in 12 male cases out of 24 (50%), whereas the other 12 (50%) had partial remission. On the other hand in female patients, 11 out of 21 (52.4%) showed complete remission, 6 (28.6%) had partial remission, and 4 (19%) died during the course of chemotherapy. No statistical differences between males and females regarding the response to chemotherapy could be observed (Chi = 2.9, $P > 0.05$).

Response to chemotherapy and age (table 26): In patients with ages $\leq$ 30 years, 10 cases out of 21 (47.6%) showed complete remission whereas 11 (52.4%) had partial remission. On the other hand, in patients with ages > 30 years, 12 cases out of 24 (50%) showed complete remission, whereas 8 (33.3%) had partial remission, and the remaining 4 cases (16.7%) died during the course of chemotherapy. Statistical comparison regarding the response to chemotherapy between the two groups of ages revealed insignificant differences (Chi = 2.4, $P > 0.05$).

Response to chemotherapy and performance status (table 26): Out of 34 patients presented with performance status 1, 21 cases (61.8%) showed complete remission and 13 (38.2%) had partial remission. On the other hand, out of 11 patients presented with performance status 2, 2 cases

(18.2%) achieved complete remission, 5 (45.5%) had partial remission, and 4 (36.3%) died during the course of chemotherapy. There were no statistical differences between performance status 1 and 2 regarding the response to chemotherapy (Chi = 1.07, P > 0.05).

Response to chemotherapy and fever (table 27): 25 patients presented with fever, 10 cases of them (40%) showed complete remission, 13 (52%) had partial remission, and 2 cases (8%) died during the course of chemotherapy. On the other hand, 20 cases presented without fever, 13 of them (65%) showed complete remission, 5 (25%) had partial remission, and 2 cases (10%) died during the chemotherapy course. Statistical comparison between the two groups elicited insignificant differences (Chi = 3.4, P > 0.05).

Response to chemotherapy and purpura (table 27): 23 Patients presented with purpura, 8 of them (34.8%) showed complete remission, and 11 (47.8%) had partial remission, and 4 (17.4%) died during the course of chemotherapy. On the other hand, 22 cases had no purpura, 15 of them (68.2%) showed complete remission whereas the remaining 7 (31.8%) showed partial remission. The response of patients without purpura to chemotherapy was significantly better than that of patients with purpura (Chi = 4.4, P < 0.05).

Response to chemotherapy and lymphadenopathy (table 27): 8 out of 16 patients (50%) presented with lymphadenopathy achieved complete remission, 6 (37.5%) had partial remission, and 2 cases (12.5%) died during the chemotherapy course. On the other hand, 15 out of 29 patients (51.7%) presented with lymphadenopathy achieved complete remission, 12 (41.4%) had partial remission, and 2 (6.9%) case died during the course of chemotherapy. No statistical differences regarding the response

to chemotherapy could be elicited between patients with lymphadenopathy compared to those without (Chi = 0.93, P > 0.05).

Response to chemotherapy and hemoglobin level at presentation (table 28 & figure 24): Patients achieving complete remission had hemoglobin level ranged from 6.4 to 10.4 with a mean of 6.8 ± 3.9 gm/dl. On the other hand, those who showed partial remission had hemoglobin level ranged from 5.1 to 8.2 with a mean of 6.1 ± 2.7 gm/dl. Those who died had hemoglobin level ranged from 4.6 to 8.6 with a mean of 5.3 ± 3.6 gm/dl. Statistical comparison among the three groups revealed insignificant differences regarding hemoglobin level (Chi = 0.83, P > 0.05).

Response to chemotherapy and platelets count at presentation (table 28 & figure 24): The complete remission group had platelets count ranged from 30 to 153 with a mean of 96.5 ± 39.7 thousands/ml. On the other hand, the partial remission group had count ranged from 13 to 542 with a mean of 87.3 ± 54.1 thousands/ml. Moreover those who died had count ranged from 14.3 to 102.1 with a mean of 81.2 ± 63.7 thousands/ml. No statistical differences among the three groups could be elicited (Chi = 0.98, P > 0.05).

Response to chemotherapy and total leucocytic count (TLC) at presentation (table 28 & figure 24): Patients achieving complete remission had TLC ranged from 5.2 to 35.6 with a mean of 23.7 ± 13.4 thousands/ml. Patients developing partial remission had TLC ranged from 3.3 to 73.1 with a mean of 49.6 ± 32.7 thousands/ml. Patients who died had TLC ranged from 9.5 to 89.1 with a mean of 70.2 ± 37.2 thousands/ml. Statistical comparison among the three

groups revealed that TLC of patients achieved complete remission is significantly less than that of the others (Chi = 18.6, $P < 0.05$).

Response to chemotherapy and blast cells percentage in peripheral blood at presentation (table 28 & figure 24): Complete remission group had blast cells ranged from 5% to 53% with a mean of 25.3 ± 13.9%. Patients with partial remission had blast cells ranged from 11% to 84% with a mean of 45.1 ± 27.3%. On the other hand, those who died had blast cells ranged from 21% to 76% with a mean of 43.9 ± 30.6%. Statistical comparison showed that blast cells percentage in the peripheral blood of patients developing complete remission is significantly less than that of those who showed partial remission and those who died (Chi = 5.2, $P < 0.05$).

Response to chemotherapy and blast cells percentage in bone marrow at presentation (table 28 & figure 24): Patients showing complete remission had blast cells ranged from 15% to 73% with a mean of 35.2 ± 16.9%. Patients with partial remission had blast cells ranged from 22% to 91% with a mean of 46.7 ± 35.1%. Patients died during the chemotherapy course had blast cells ranged from 18% to 97% with a mean of 49.1 ± 31.7%. It could be statistically noted that blast cells percentage in bone marrow of patients achieving complete remission is significantly less than that of the others (Chi = 4.9, $P < 0.05$).

Response to chemotherapy and different FAB subtypes (table 29 & figure 25): There were 23 cases showed complete remission, M1 was seen in 5 of them (21.7%), M2 in 5 (21.7%), M3 in 3 (13.2%), M4 in 5 (21.7%), and M5 was observed in the remaining 5 cases (21.7%). On the other hand, 18 cases showed partial remission, M1 was noticed in 5 of them (27.8%), M2 in 5 (27.8%), M3 in 4 (22.2%), M4 in 2 (11.1%),

and M5 in the remaining 2 (11.1%). Complete remission was achieved equally in M1, M2, M4, and M5, whereas in M3 it was less than others.

Response to chemotherapy and interleukin 6 level at presentation (table 30 & figure 26): Patients showing complete remission had IL-6 level ranged from 4.2 to 33.5 with a mean of 12.9 ± 9.1 ng/ml. Whereas, its level in those showing partial remission ranged from 4.8 to 36 with a mean of 14.9 ± 8.9 ng/ml. Those who died had level ranged from 4.5 to 33.8 with a mean of 14.2 ± 9.1 ng/ml. Statistical comparison among the three groups elicited no significant changes in IL-6 level (Chi = 1.5, $P > 0.05$).

Response to chemotherapy and interleukin 8 level at presentation (table 30 & figure 26): Interleukin 8 level in patients achieving complete remission ranged from 1.4 to 5.2 with a mean of 3.1 ± 1.1 ng/ml. On the other hand, in those having partial remission, it ranged from 1.6 to 9.1 with a mean of 3.5 ± 2.1 ng/ml. Its level in those who died ranged from 1.9 to 8.3 with a mean of 3.5 ± 1.7 ng/ml. No statistical differences regarding IL-8 level could be noted among the various groups (Chi = 0.9, $P > 0.05$).

Response to chemotherapy and tumor necrosis factor alpha level at presentation (table 30 & figure 26): In complete remission group, TNF-α level ranged from 15.2 to 88.2 with a mean of 48.7 ± 36.3 ng/ml. In those showing partial remission, it ranged from 29.7 to 88.8 with a mean of 59.2 ± 17.4 ng/ml. Patients died during the course of chemotherapy had TNF-α level ranged from 21.7 to 79.3 with a mean of 57.1 ± 23.8 ng/ml. Statistical comparison revealed no significant differences in TNF-α level among the different groups (Chi = 2.1, $P > 0.05$).

Response to chemotherapy and soluble Fas (sFas) level at presentation (table 30 & figure 26): Patients achieving complete remission had sFas level ranged from 462 to 1590 with a mean of 997 ± 297 pg/ml. Those showing partial remission had sFas level ranged from 546 to 1698 with a mean of 933 ± 304. Patients died during the course of chemotherapy had sFas level ranged from 511 to 1637 with a mean of 951 ± 311 pg/ml. No significant differences could be noticed regarding sFas level among the three groups (Chi = 1.3, $P > 0.05$).

III-Response to chemotherapy according to different cytokines and/or sFas combinations:

In this work, the patients were divided regarding to IL-6, IL-8, TNF-α, and sFas levels as follows:

IL-6 level: Patients with IL-6 ≤ 8.2 ng/ml including 6 cases and those with IL-6 > 8.2 ng/ml comprising 39 cases.

IL-8 level: Patients with IL-8 ≤ 4.2 ng/ml including 21 cases and those with IL-8 > 4.2 ng/ml comprising 24 cases.

TNF-α level: Patients with TNF-α ≤ 45.1 ng/ml comprising 5 cases and those with TNF-α > 45.1 ng/ml containing 40 cases.

Soluble Fas level: Patients with sFas ≤ 812 pg/ml including 8 cases and those with sFas > 812 pg/ml containing 37 cases.

Using the level of IL-6 equals 8.2 ng/ml, IL-8 equals 4.2 ng/ml, TNF-α equals 45.1 ng/ml, and sFas equals 812 pg/ml is attributed to the fact that these levels are equal to their maximum levels in the controls.

Response to chemotherapy in patients who had both IL-6 > 8.2 ng/ml and TNF-α > 45.1 ng/ml at presentation (table 33): Out of the 23 patients

achieving complete remission, 19 (82.6%) had elevated either IL-6 > 8.2 ng/ml or TNF-α > 45.1 ng/ml or no elevation of both, whereas, 4 cases (17.4%) had elevated both IL-6 > 8.2 ng/ml and TNF-α > 45.1 ng/ml. On the other hand, 18 cases showed partial remission, 8 of them (44.4%) had elevated either IL-6 > 8.2 ng/ml or TNF-α > 45.1 ng/ml or no elevation of both, whereas, the remaining 10 cases (55.6 %) had elevated both IL-6 level > 8.2 ng/ml and TNF-α > 45.1 ng/ml. It could be noticed that patients with elevated both IL-6 and TNF-α showed bad response to chemotherapy comparing to those with elevated either IL-6 or TNF-α or no elevation of both (Chi = 14.2, $P < 0.05$).

Response to chemotherapy in patients who had both IL-6 > 8.2 ng/ml and sFas > 812 pg/ml at presentation (table 33): Out of 23 patients achieving complete remission, 15 cases (65.2%) had elevated either IL-6 > 8.2 ng/ml or sFas > 812 pg/ml or no elevation of both, whereas, 8 cases (34.8%) had elevated both IL-6 and sFas level. On the other hand, 18 cases showing partial remission, 11 of them (61.1%) had elevated either IL-6 > 8.2 ng/ml or sFas > 812 pg/ml or no elevation of both, whereas, 7 cases (38.9%) had elevated both IL-6 level and sFas. No statistical differences could be noticed regarding the response to chemotherapy between patients with elevated both IL-6 and sFas levels compared to those with elevated either one of them or no elevation of both (Chi = 4.1, $P > 0.05$).

Response to chemotherapy in patients who had both IL-8 > 4.2 ng/ml and TNF-α > 45.1 ng/ml at presentation (table 33): There were 23 cases achieving complete remission, all of them (100 %) had elevation of either IL-8 > 4.2 ng/ml or TNF-α > 45.1 ng/ml or no elevation of both. On the other hand, 18 cases showing partial remission, 16 of them (88.9%) had elevated either IL-8 > 4.2 ng/ml or TNF-α > 45.1 ng/ml or

no elevation of both, whereas, 2 cases (11.1%) had elevated both IL-8 and TNF-α. Statistical comparison revealed no significant differences regarding the response to chemotherapy between patients having elevated both IL-8 and TNF-α ng/ml compared to those with elevated either IL-8 or TNF-α or no elevation of both (Chi = 3.6, P > 0.05).

Response to chemotherapy in patients who had both IL-8 > 4.2 ng/ml and sFas > 812 pg/ml at presentation (table 33): Out of 23 cases showed complete remission, 21 patients (91.3 %) had elevated either IL-8 > 4.2 ng/ml or sFas > 812 pg/ml or no elevation of both, whereas, only 2 cases (8.7%) had elevated both IL-8 and sFas. On the other hand, out of the 18 cases achieved partial remission, 16 patients (88.9%) had elevated either IL-8 > 4.2 ng/ml or sFas > 812 pg/ml or no elevation of both, whereas, 2 cases (11.1%) had elevated both IL-8 and sFas. Statistical comparison revealed no significant differences regarding the response to chemotherapy between patients with elevated both IL-8 and sFas comparing to those with elevated either IL-8 or sFas or no elevation of both (Chi = 2.9, P > 0.05).

Response to chemotherapy in patients who had both TNF-α > 45.1 ng/ml and sFas > 812 pg/ml at presentation (table 33): 15 cases out of 23 (65.2%) who showed complete remission had elevated either sFas > 812 pg/ml or TNF-α > 45.1 ng/ml or no elevation of both, whereas, 8 cases (34.8%) had elevated both sFas and TNF-α. On the other hand, 11 cases out of 18 (61.1%) who achieved partial remission had elevated either sFas > 812 pg/ml or TNF-α > 45.1 ng/ml or no elevation of both, whereas, 7 cases (38.9%) had elevated both sFas and TNF-α levels. No statistical significance could be recorded regarding the response to chemotherapy between patients with

elevated both TNF-α and sFas compared to those with elevated either one of them or no elevation of both (Chi = 4.7, $P > 0.05$).

IV-Data obtained from comparing the laboratory parameters 2 weeks after the end of chemotherapy to both that of the patients at presentation and that of controls:

Hemoglobin level (table 31 & 32): Its mean level ± standard deviation (SD) after the end of chemotherapy by 2 weeks was 4.9 ± 1.7 gm/dl, at patient's presentation was 6.9 ± 3.1 gm/dl, and in controls was 13.1 ± 4.9 gm/dl. Statistical decrease of hemoglobin level 2 weeks after the end of chemotherapy compared to that at presentation (Chi = 9.1, $P < 0.05$) and to that of controls (Chi = 8.7, $P < 0.05$) was reported.

Red blood corpuscles (table 31 & 32): Its mean count ± SD 2 weeks after the end of chemotherapy was 1.3 ± 0.7 millions/ml, whereas, at patient's presentation, it was 2.1 ± 1.5 millions/ml. In the controls, it was 5.12 ± 1.7 millions/ml. Statistical decrease of red blood corpuscles count 2 weeks after the end of chemotherapy compared to that at presentation (Chi = 9.7, $P < 0.00$) and to that of controls (Chi = 7.3, $P < 0.05$) was noticed.

Total leucocytic count (table 31 & 32): Its mean count ± SD 2 weeks after the end of chemotherapy was 1.9 ± 1.5 thousands/ml, at patient's presentation was 42.7 ± 20.5 thousands/ml, and in controls was 5.3 ± 1.54 thousands/ml. Statistical decrease of total leucocytic count 2 weeks after the end of chemotherapy compared to that at patient's presentation (Chi = 6.1, $P < 0.05$) and to that of controls (Chi = 5.9, $P < 0.05$) was found.

Platelets (table 31 & 32): Its mean count ± SD was 39.6 ± 19.7 thousands/ml 2 weeks after the end of chemotherapy. It was 66.7 ± 35.9 thousands/ml at patient's presentation, and it was 317 ± 95 thousands/ml in the controls. Significant decrease of platelets count 2 weeks after the end of chemotherapy compared to its count at presentation (Chi = 5.7, $P < 0.05$) and to its count in the controls (Chi = 6.1, $P < 0.05$) was found.

Blast cells percentage in peripheral blood (table 31 & 32): Its mean percentage ± SD after chemotherapy end by 2 weeks was 4.9 ± 3.7%, while, its percentage at presentation was 48.3 ± 32.7 %. Significant decrease of blast cells percentage 2 weeks after the end of chemotherapy comparing to that at presentation was recorded (Chi = 7.6, $P < 0.05$). No comparison with its percentage in controls was done due to there are no detected blast cells in peripheral blood of control group.

Blast cells percentage in bone marrow (table 31 & 32): The mean percentage ± SD after chemotherapy end by 2 weeks was 8.1 ± 6.3 %, whereas, at patient's presentation was 61.7 ± 29.6 %. There was significant statistical decrease in blast cells percentage after the end of chemotherapy by 2 weeks compared to that at patient's presentation (Chi = 7.1, $P < 0.05$). No comparison was done with that of controls because of blast cells absence in bone marrow of controls.

Interleukin 6 (IL-6) (table 31 & 32 & figure 27): Its mean level ± SD at patient's presentation was 13.2 ± 8.8 ng/ml. Whereas after chemotherapy end by 2 weeks, it was 12.8 ± 9.1 ng/ml. There was insignificant change of IL-6 level 2 weeks after the end of chemotherapy compared to its level at patient's presentation (Chi = 0.42, $P > 0.05$).

On the other hand, the mean IL-6 level in controls was 6.1 + 0.9 ng/ml. Statistical decrease of IL-6 level 2 weeks after the end of chemotherapy compared to that of controls was noted (Chi = 4.9, $P < 0.05$).

Interleukin 8 (IL-8) level (table 31 & 32 & figure 27): It was 3.5 ± 1.6 ng/ml at patient's presentation, 3.8 ± 1.6 ng/ml after the end of chemotherapy by 2 weeks, and 2.6 ± 0.9 ng/ml in controls. There were insignificant changes of IL-8 level after the end of chemotherapy by 2 weeks compared to that at patient's presentation (Chi = 1.4, $P > 0.05$), and to that of controls (Chi = 1.7, $P > 0.05$).

Tumor necrosis factor alpha level (table 31 & 32 & figure 27): Its mean level ± SD after the end of chemotherapy by 2 weeks was 32.5 ± 15.3 ng/ml. Whereas at patient's presentation was 51.9 ± 22.8 ng/ml, and in controls was 32.1 ± 8.5 ng/ml. There was statistical decrease of TNF-α level after the end of chemotherapy by 2 weeks compared to that at patient's presentation (Chi = 6.1, $P < 0.05$), whereas, there was no statistical changes of TNF-α level 2 weeks after the end of chemotherapy compared to that of controls (Chi = 2.1, $P > 0.05$).

Soluble Fas (sFas) level (table 31 & 32 & figure 27): Its mean level ± SD 2 weeks after the end of chemotherapy was 1015.2 ± 268.5 pg / ml, at patient's presentation was 955.4 ± 288.9 pg/ml, and in controls was 711.2 ± 106.3 pg/ml. It was noticed that, no statistical changes in sFas level 2 weeks after the end of chemotherapy compared to that at patient's presentation (Chi = 0.8, $P > 0.05$), whereas, it was statistically higher than its level in the control group (Chi = 5.6, $P < 0.05$).

Table (13): Age, sex, and performance status in study group:

Total number = 45 cases.

Item		Number	Percentage
Age in years	Age ≤ 30 years	22 out of 45	48.9%
	Age > 30 years	23 out of 45	51.1%
Sex	Males	24 out of 45	53.3%
	Females	21 out of 45	46.7%
Performance status (PS)	PS 1	34 out of 45	75.6%
	PS 2	11 out of 45	24.4%

P-value ≤ 0.05 is statistically significant.

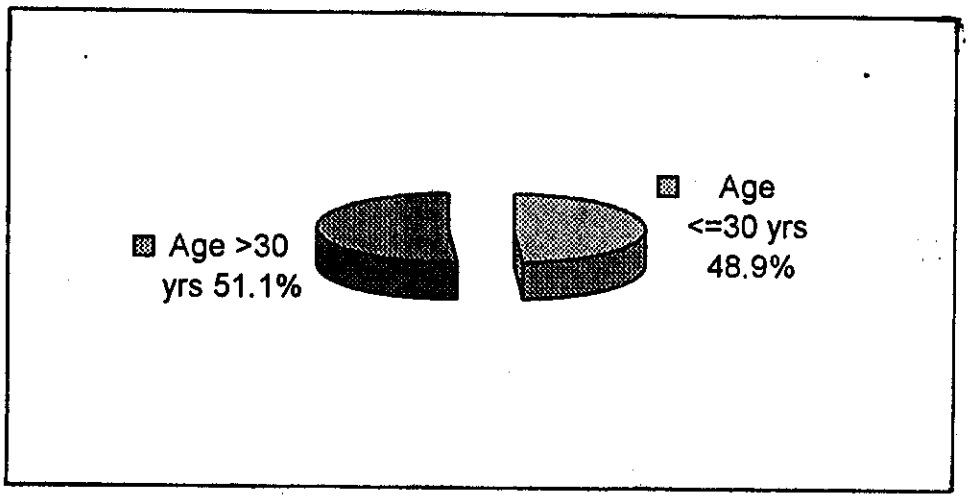


Figure (10): Age and AML patients.

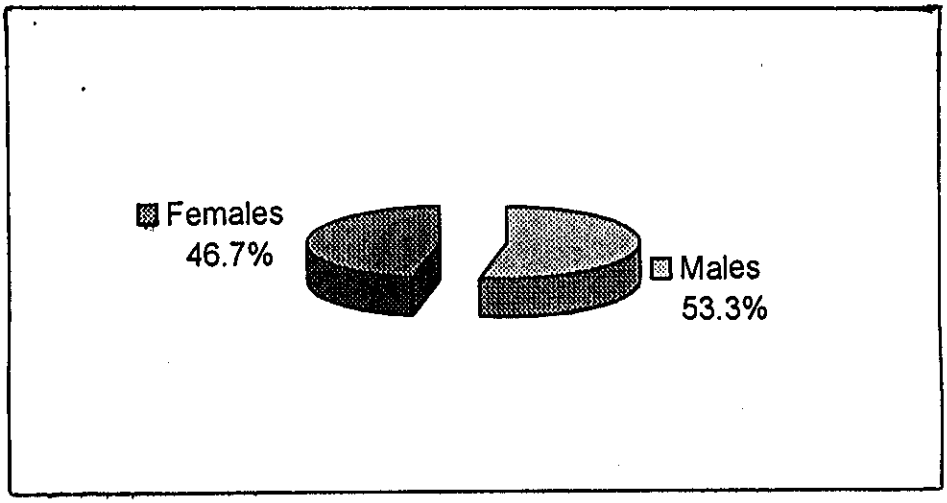


Figure (11): Percentage of males and females in study group.

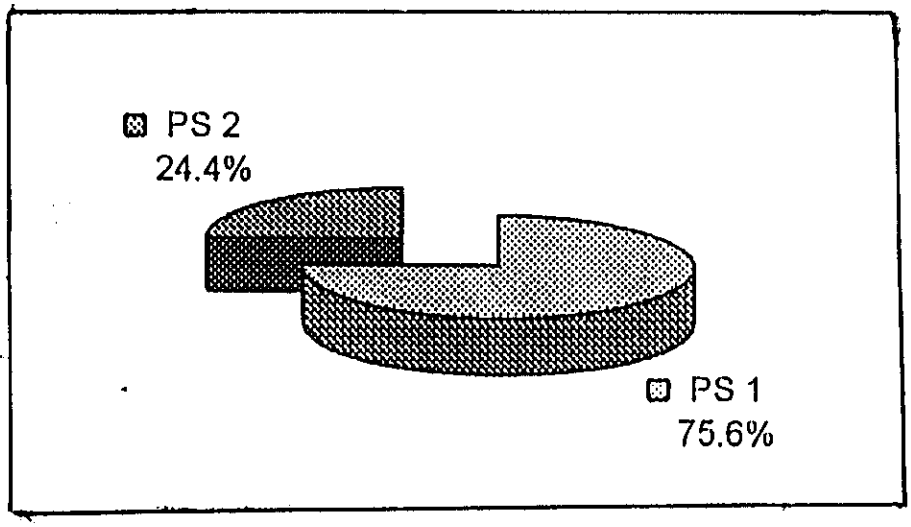


Figure (12) Performance status in AML patients.

Table (14): Percentage of various clinical manifestations in study group:

Total number = 45 cases.

Item	Number of cases	Percentage
Fever	25	55.6%
Purpura	23	51.1%
Lymphadenopathy	16	35.6%
Sternal pain and tenderness	30	66.7%
Weight loss	14	31.1%
Pallor	44	97.8%
Splenomegaly	6	13.3%

Table (15) : Age and sex according to performance status:

Total number = 45 cases.

Item		Performance status 1 34 cases	Performance status 2 11 cases	P-value
Age in years	Age ≤ 30 years	17 cases (50%)	5 cases (45.4%)	0.20
	Age > 30 years	17 cases (50%)	6 cases (54.6%)	
Sex	Males	18 cases (52.9%)	6 cases (54.6%)	0.92
	Females	16 cases (47.1%)	5 cases(45.4%)	

P-value ≤ 0.05 is statistically significant.

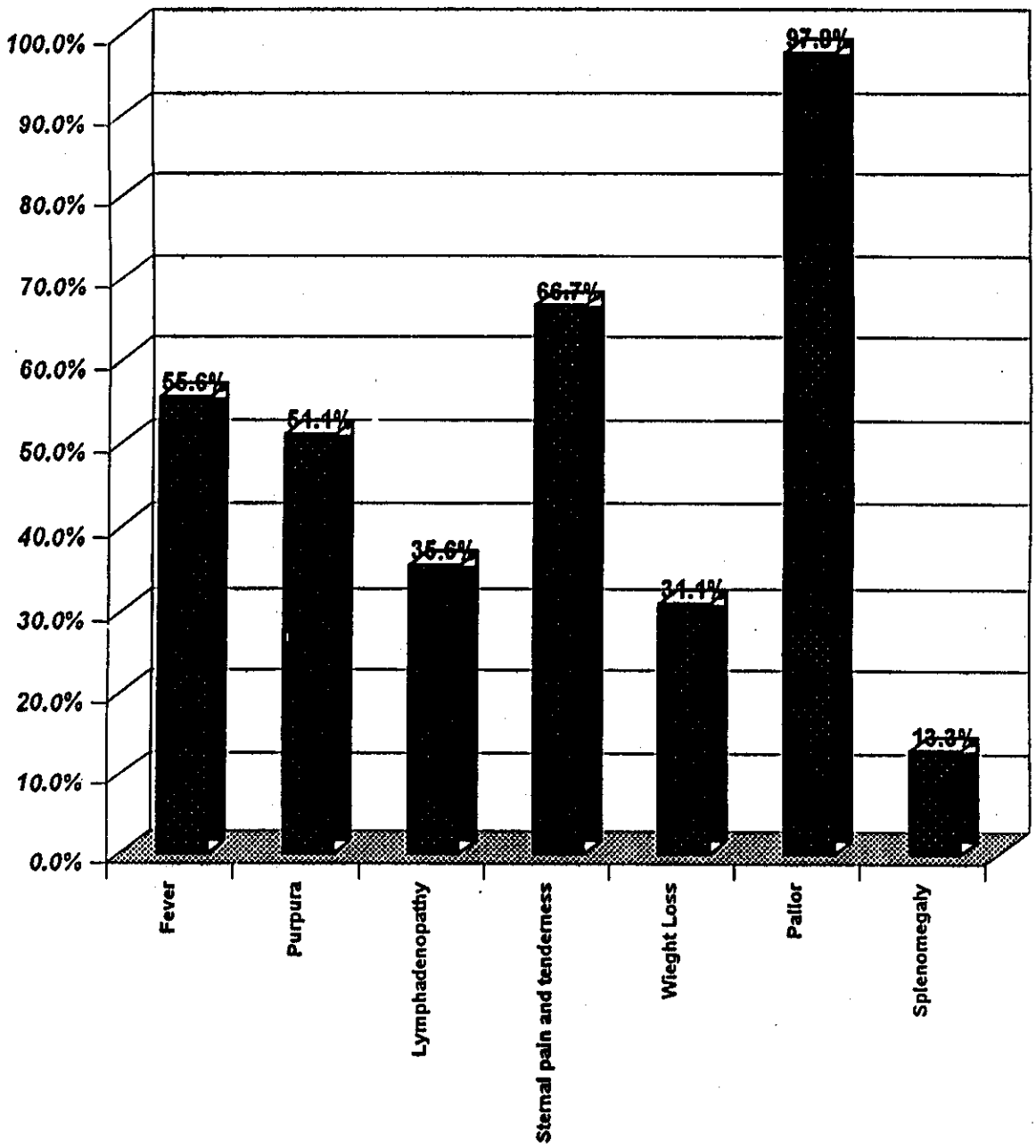


Figure (13): Various clinical manifestations in study group.

Table (16): Hemoglobin level, red blood corpuscles, total leucocytic count, platelets count, and blast cells percentage in peripheral blood and bone marrow in study group at presentation and in controls:

Total number = 45 cases.

Item		Control group	Study group	P-value
Hemoglobin (HB) gm/ml	Minimum	12.6	4.6	0.03
	Maximum	14.7	10.4	
	Mean	13.1	6.9	
	SD	4.9	3.1	
Red blood corpuscles (RBS) millions/ml	Minimum	4.73	1.2	0.009
	Maximum	5.91	3.9	
	Mean	5.12	2.1	
	SD	1.7	1.5	
Total leucocytic count (TLC) thousands/ml	Minimum	4.7	3.3	0.003
	Maximum	8.1	89.1	
	Mean	5.3	42.7	
	SD	1.5	20.5	
Platelets thousands/ml	Minimum	212.0	12.0	0.01
	Maximum	389.0	153.0	
	Mean	317.0	66.7	
	SD	95.0	35.9	
Blast cells percentage in blood	Minimum	-	8%	0.000
	Maximum	-	83%	
	Mean	-	48.3%	
	SD	-	32.7%	
Blast cells percentage in bone marrow	Minimum	-	18%	0.000
	Maximum	-	97%	
	Mean	-	51.7%	
	SD	-	29.6%	

P-value ≤ 0.05 is statistically significant.

Table (17): IL-6, IL-8, TNF-α, and sFas levels in AML patients at presentation and control group:

Total number = 45 cases.

Item		Control group	Study group	P- value
IL-6 ng/ml	Minimum	5.3	4.2	0.02
	Maximum	8.2	36.0	
	Mean	6.1	13.2	
	SD	0.9	8.8	
IL-8 ng/ml	Minimum	1.1	1.4	0.11
	Maximum	4.2	9.1	
	Mean	2.6	3.5	
	SD	0.9	1.6	
TNF-α ng/ml	Minimum	20.2	15.2	0.02
	Maximum	45.1	88.9	
	Mean	32.1	51.9	
	SD	8.5	22.8	
sFas pg/ml	Minimum	513	462.0	0.02
	Maximum	812	1698.0	
	Mean	711.2	955.4	
	SD	106.3	288.9	

P-value $\leq$ 0.05 is statistically significant.

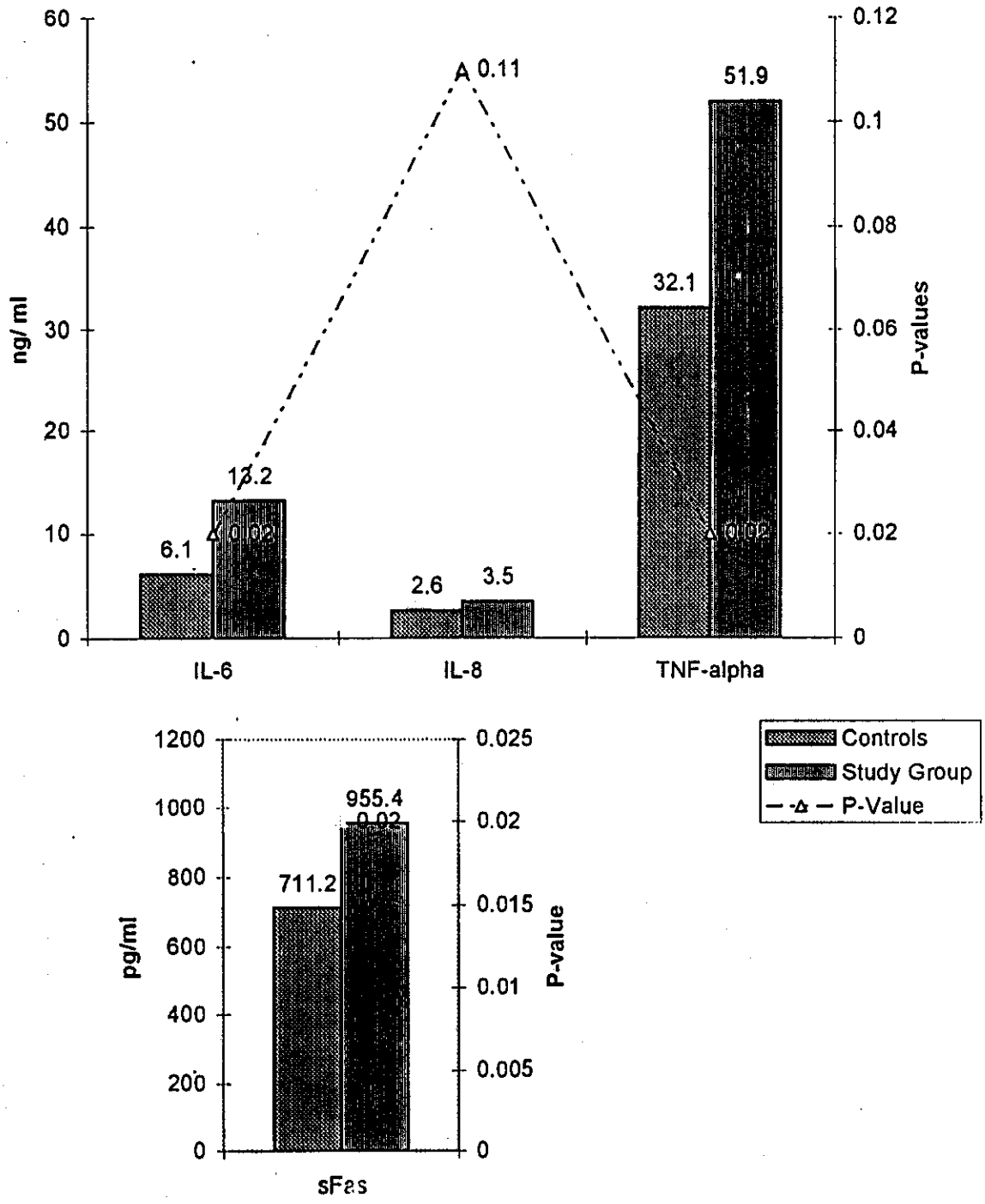


Figure (14): Statistical comparison of IL-6, IL-8, TNF-alpha, and sFas levels in AML patients at presentation and control group.

Table (18): Prevalence of different FAB subtypes in the study group and its relation to sex:

Total number = 45 cases.

Item		M1	M2	M3	M4	M5	P-value
Total		10 cases 22.2%	12 cases 26.6%	9 cases 20.0%	7 cases 15.6%	7 cases 15.6%	-
Sex	Males	8 cases 80.0%	6 cases 50.0%	4 cases 44.4%	4 cases 57.1%	2 cases 28.6%	0.29
	Females	2 cases 20.0%	6 cases 50.0%	5 cases 55.6%	3 cases 42.9%	5 cases 71.4%	

P-value ≤ 0.05 is statistically significant.

Table (19): Percentage of FAB subtypes according to age and purpura:

Total number = 45 cases.

Item		M1 10 cases	M2 12 cases	M3 9 cases	M4 7 cases	M5 7 cases	P-value
Age in years	Age≤30 years 22 cases	6 cases 27.3%	6 cases 27.3%	3 cases 13.6%	3 cases 13.6%	4 cases 18.2%	0.60
	Age>30 years 23 cases	4 cases 17.4%	6 cases 26.1%	6 cases 26.1%	4 cases 17.4%	3 cases 13.0%	
Purpura	Yes 23 cases	6 cases 26.1%	6 cases 26.1%	7 cases 30.4%	2 cases 8.7%	2 cases 8.7%	0.22
	No 22 cases	4 cases 18.2%	6 cases 27.3%	2 cases 9.1%	5 cases 22.7%	5 cases 22.7%	

P-value ≤ 0.05 is statistically significant.

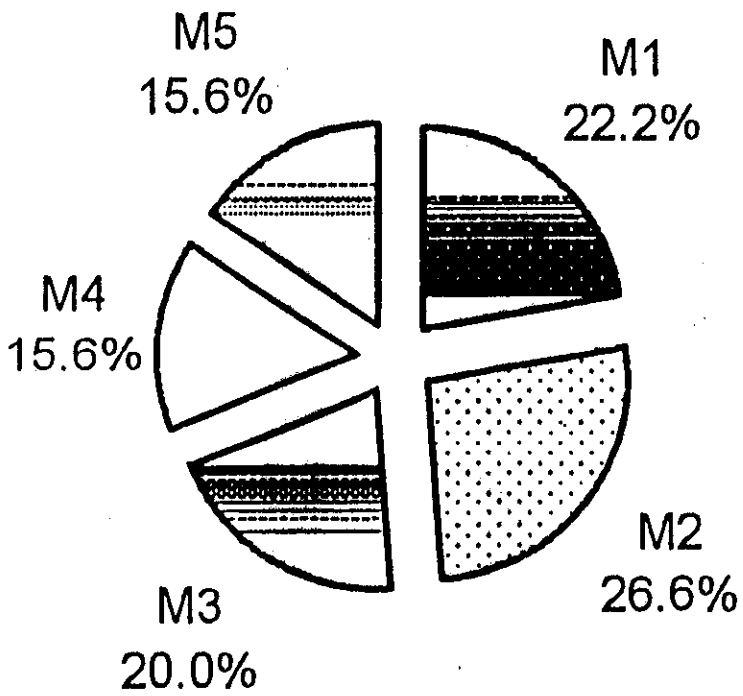


Figure (15): Percentage of FAB subtypes in the study group.

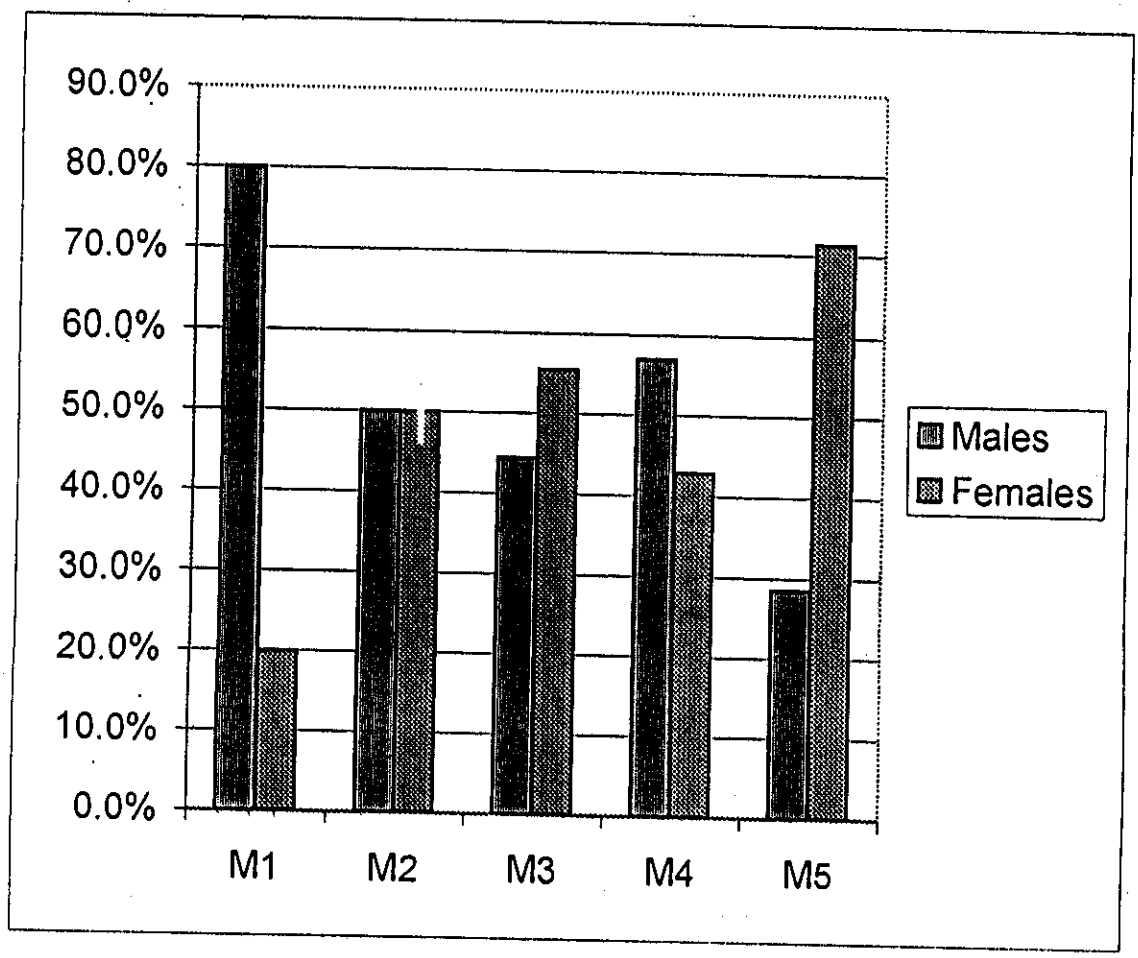


Figure (16): Comparison of FAB subtypes between males and females.

Table (20): Blast cells percentage in bone marrow of patients at presentation and FAB subtypes:

Total number = 45 cases.

Item	Blast cells % Minimum	Blast cells % Maximum	Blast cells % Mean	Blast cells % SD	P-value
M1	24.0%	97.0%	72.1%	26.8%	0.001
M2	40.0%	85.0%	56.1%	16.9%	
M3	15.0%	45.0%	25.8%	11.9%	
M4	20.0%	49.0%	31.8%	10.3%	
M5	18.0%	96.0%	41.4%	33.3%	

P-value ≤ 0.05 is statistically significant.

Table (21): Statistical comparison of IL-6, IL-8, TNF-α, and sFas levels at presentation among the different FAB subtypes.

Total number = 45 cases.

Item		IL-6 ng/ml Mean±SD	IL-8 ng/ml Mean±SD	TNF-α ng/ml Mean±SD	sFas pg/ml Mean±SD
FAB subtypes	M1	10.7 ± 4.4	3.0 ± 0.6	70.4 ± 16.8	654 ± 138
	M2	10.6 ± 6.9	2.6 ± 1.1	59.4 ± 11.5	1020 ± 220
	M3	9.4 ± 6.3	4.6 ± 1.5	40.1 ± 18.1	1107 ± 261
	M4	17.5 ± 2.5	2.9 ± 0.8	42.3 ± 31.1	1216 ± 270
	M5	21.9 ± 9.9	4.4 ± 2.6	37.3 ± 22.6	818 ± 186
P-value		0.003	0.06	0.005	0.001

P-value ≤ 0.05 is statistically significant.

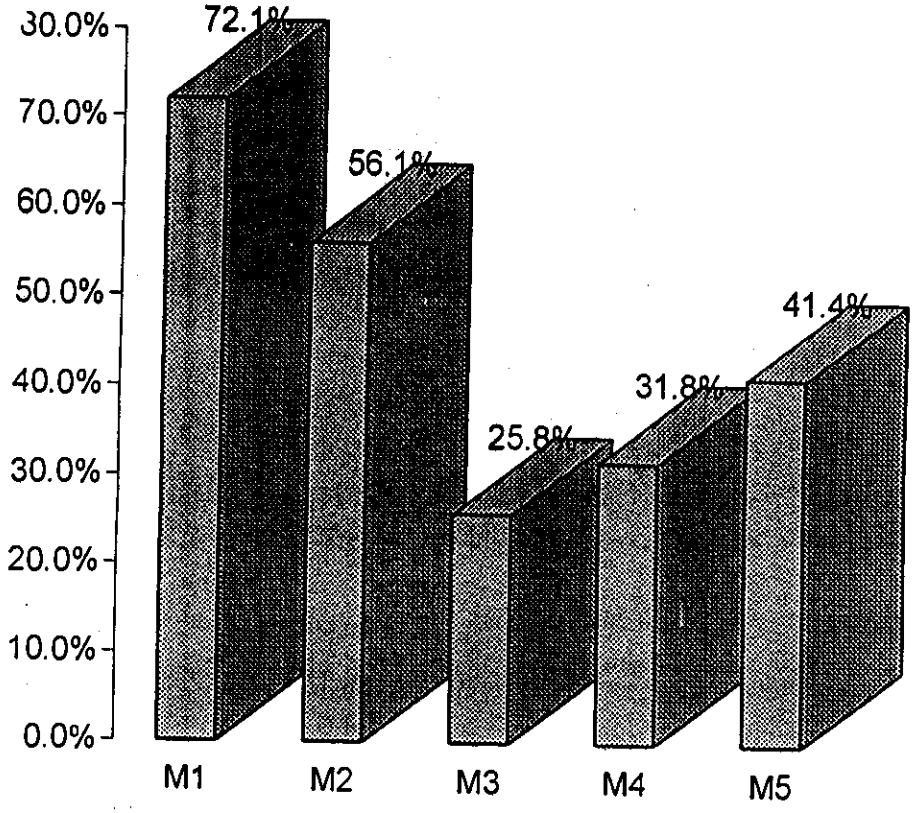


Figure (17): Comparison of blast cells percentage in bone marrow of patients at presentation among different FAB subtypes.

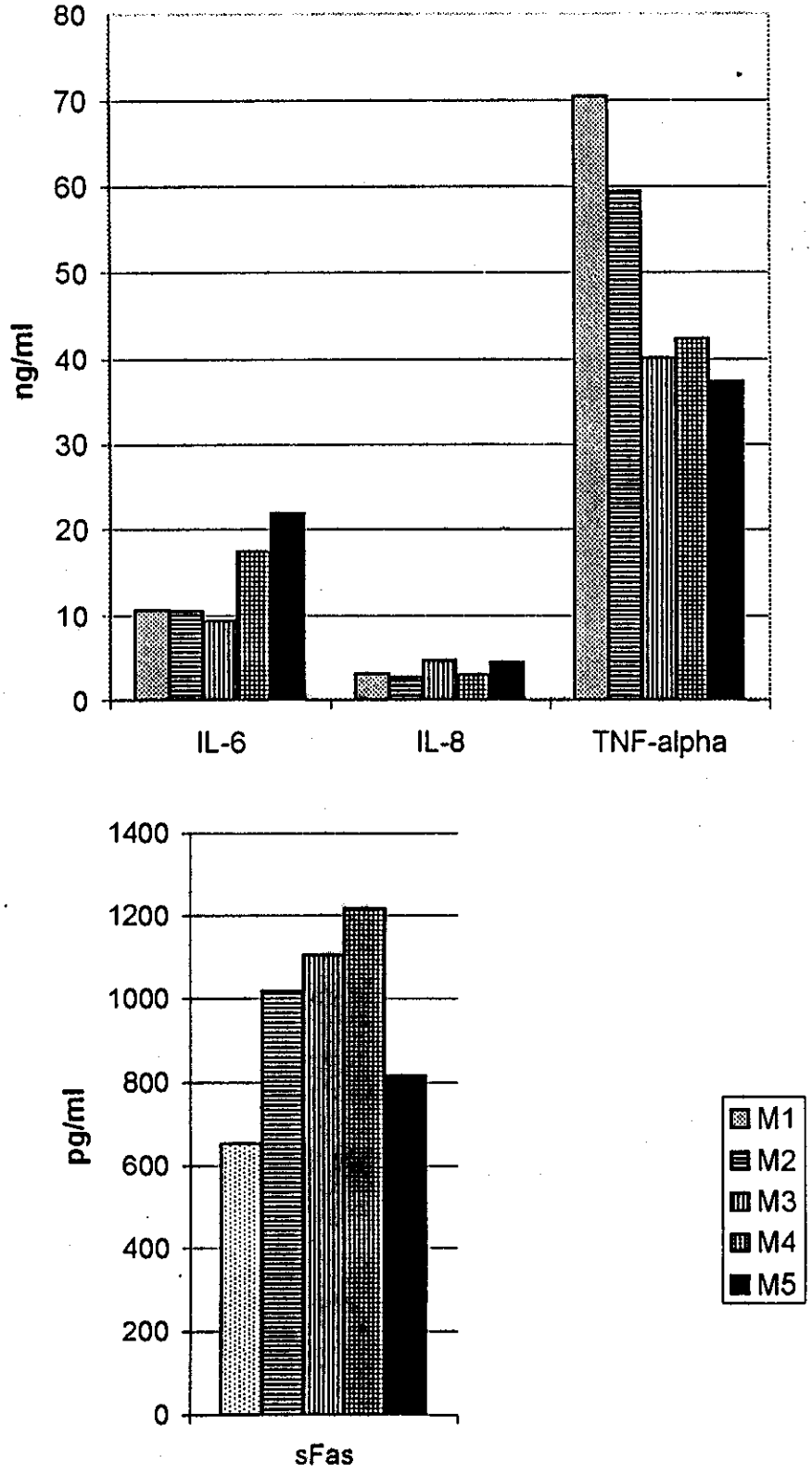


Figure (18): Statistical comparison of IL-6, IL-8, TNF-alpha, and sFas levels among various FAB subtypes.

Table (22): Statistical comparison of IL-6, IL-8, TNF-α, and sFas levels at presentation according to sex, performance status, and fever:

Total number = 45 cases.

Item		IL-6 ng/ml Mean±SD	IL-8 ng/ml Mean±SD	TNF-α ng/ml Mean±SD	sFas pg/ml Mean±SD
Sex	Males	10.7 ± 5.7	3.0 ± 1.1	58.8 ± 22.0	981.7±312.6
	Females	16.1 ± 10.8	3.9 ± 1.9	43.9 ± 21.7	925.4±263.6
	P-value	0.18	0.25	0.045	0.50
Performance status (PS)	PS 1	13.6 ± 9.7	3.4 ± 1.6	55.1 ± 22.3	983 ± 305
	PS 2	12.2 ± 5.6	3.6 ± 1.5	41.9 ± 22.9	868 ± 219
	P-value	0.82	0.55	0.09	0.20
Fever	Yes	13.9 ± 8.3	3.5 ± 1.6	58.9 ± 20.3	984 ± 343
	No	12.3 ± 9.4	3.3 ± 1.5	43.1 ± 23.3	918 ± 204
	P-value	0.42	0.71	0.02	0.73

P-value ≤ 0.05 is statistically significant.

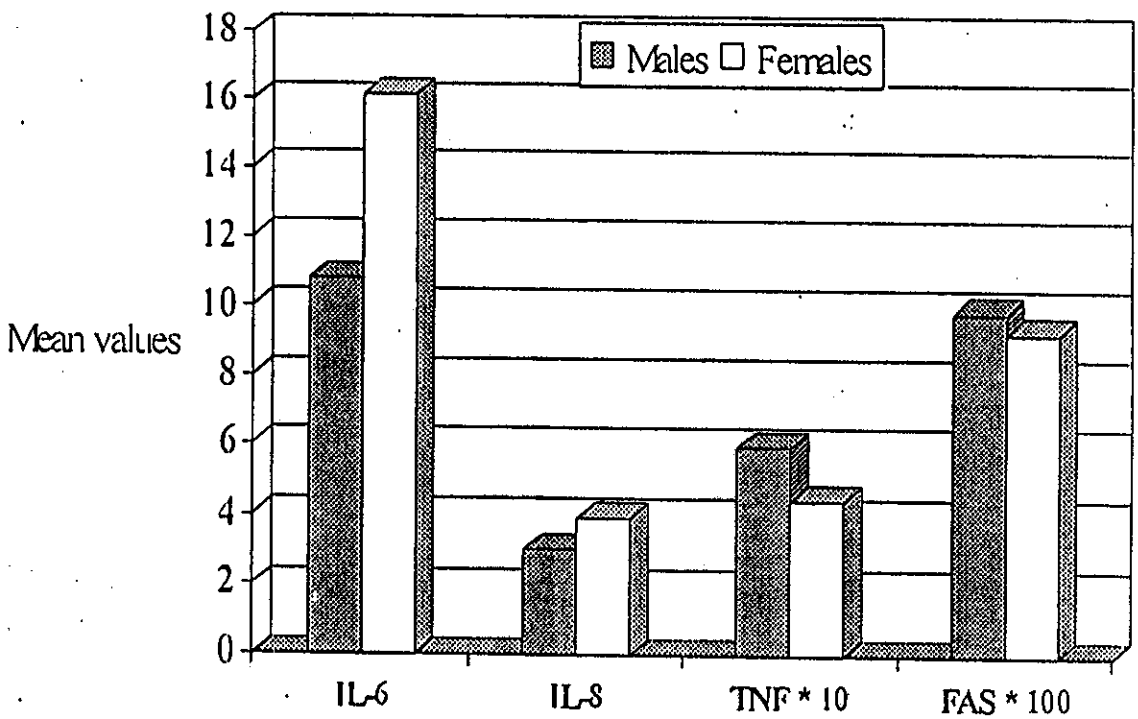


Figure (19): Statistical comparison of IL-6, IL-8, TNF-alpha, and sFas levels in patients at presentation according to sex

Table (23): Statistical comparison of IL-6, IL-8, TNF-alpha, and sFas levels in patients at presentation according to purpura, lymphadenopathy, and splenomegaly:

Total number = 45 cases.

Item		IL-6 ng/ml Mean ± SD	IL-8 ng/ml Mean ± SD	TNF-α ng/ml Mean ± SD	sFas pg/ml Mean ± SD
Purpura	Yes	17.1 ± 10.2	3.4 ± 1.3	55.6 ± 22.4	1006 ± 339
	No	9.5 ± 5.0	3.6 ± 1.8	48.0 ± 23.2	902 ± 220
	P-value	0.01	0.83	0.35	0.29
Lymph-adenopathy	Yes	11.2 ± 5.7	3.3 ± 1.1	44.2 ± 18.6	891 ± 232
	No	14.4 ± 10.1	3.5 ± 1.8	56.1 ± 24.2	990 ± 313
	P-value	0.46	0.66	0.05	0.42
Spleno-megaly	Yes	11.3 ± 5.7	3.2 ± 0.7	67.7 ± 17.9	792 ± 192
	No	14.2 ± 9.0	3.5 ± 1.7	49.5 ± 22.8	980 ± 301
	P-value	0.12	0.78	0.07	0.13

P-value ≤ 0.05 is statistically significant.

Table (24): Statistical comparison of blast cells percentage in bone marrow of patients according to IL-6, IL-8, TNF-α, and sFas levels at presentation.

Total number = 45 cases.

Item		Minimum	Maximum	Mean ± SD	P-value
IL-6 ng/ml	IL-6≤ 8.2	15%	97%	58.5 ± 25.9%	0.03
	IL-6> 8.2	17%	90%	39.6 ± 24.6%	
IL-8 ng/ml	IL-8 ≤ 4.2	18%	97%	52.6 ± 26.3%	0.001
	IL-8 > 4.2	15%	45%	24.4 ± 12.5%	
TNF-α ng/ml	TNF-α ≤ 45.1	15%	90%	35.5 ± 25.7%	0.004
	TNF-α > 45.1	20%	97%	55.6 ± 24.5%	
sFas pg/ml	sFas ≤ 812	20%	94%	67.5 ± 29.1%	0.003
	sFas > 812	15%	97%	37.6 ± 18.9%	

P-value ≤ 0.05 is statistically significant.

Table (25): Response of AML patients to chemotherapy:

Total number = 45 cases.

Item	Number of cases	Percentage
Complete remission	23 cases	51.1%
Partial remission	18 cases	40.0%
Death	4 cases	8.9%

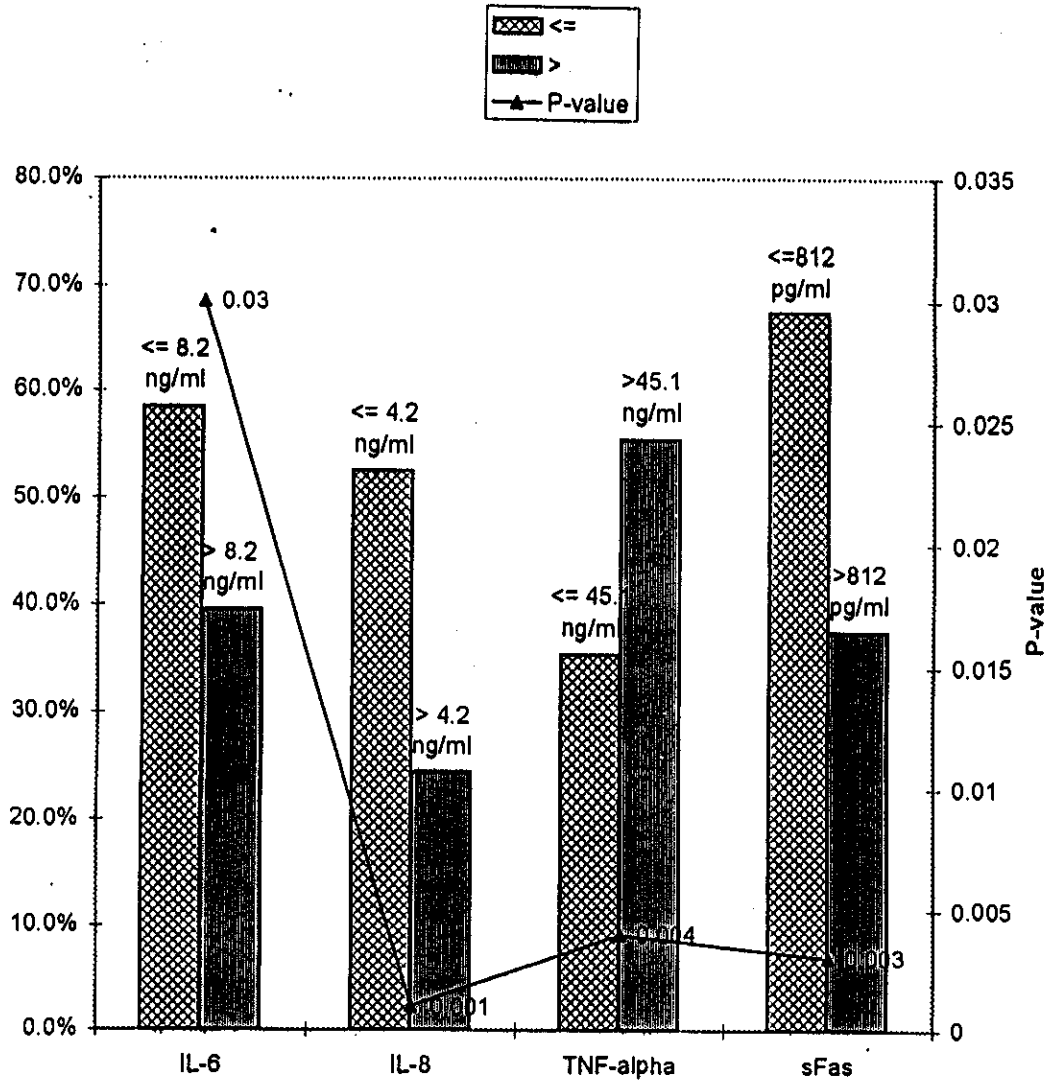


Figure (20): Statistical comparison of blast cells percentage in bone marrow of patients according to IL-6, IL-8, TNF-α, and sFas levels at presentation.

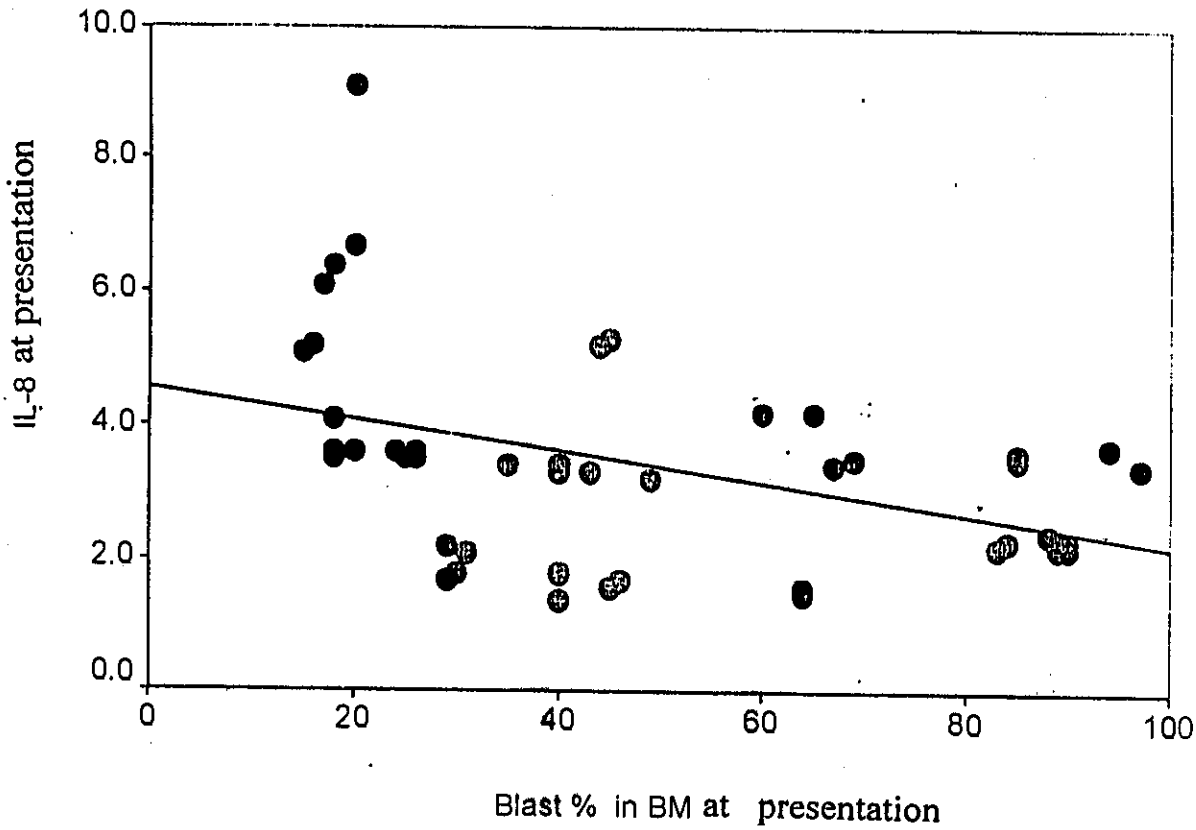


Figure (21): Correlation between blast cells percentage in bone marrow and IL-8 level in AML patients at presentation.

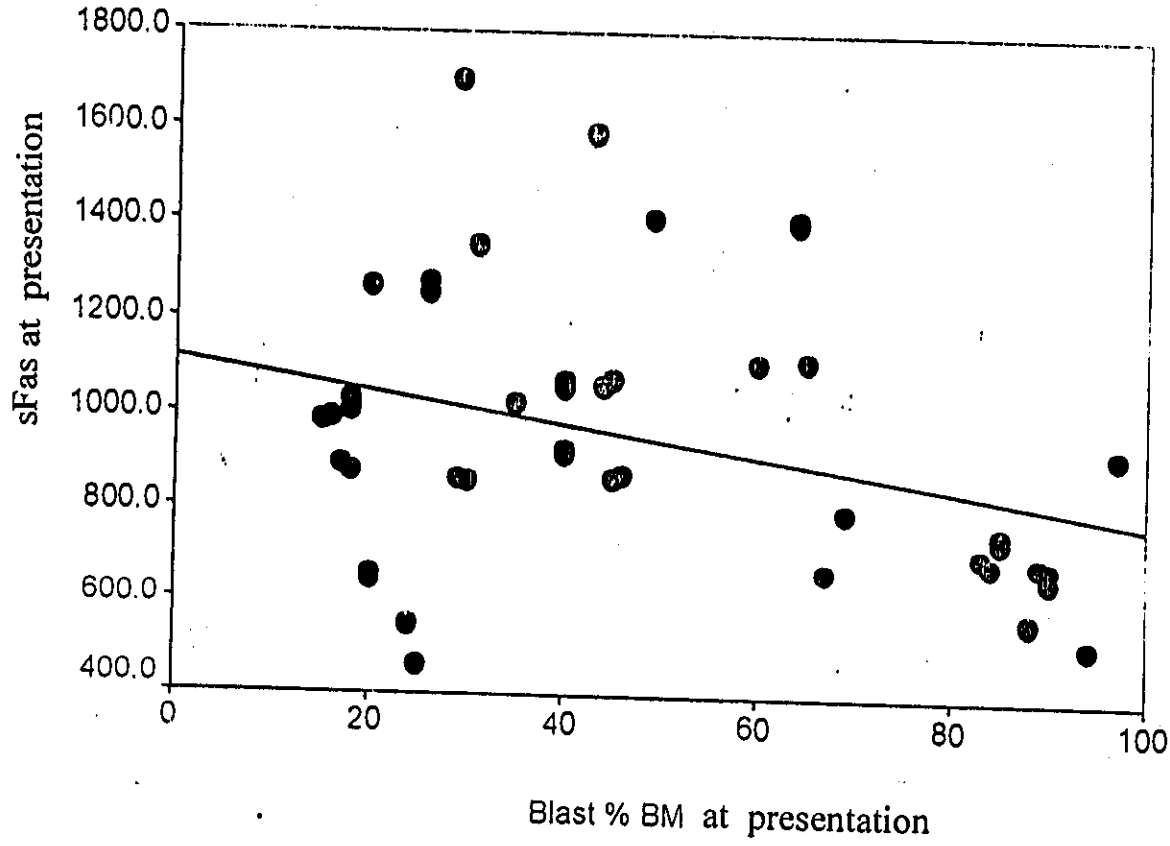


Figure (22): Correlation between blast cells percentage in bone marrow and sFas level in AML patients at presentation.

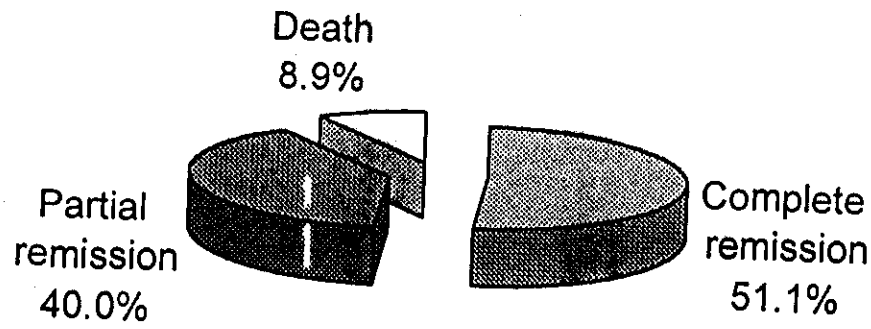


Figure (23): Response of AML patients to chemotherapy.

Table (26): Response to chemotherapy according to sex, age, and performance status in study group:

Total number = 45 cases.

Item		Complete remission	Partial remission	Death	P-value
Sex	Males 24 cases	12 cases 50%	12 cases 50%	-	0.35
	Females 21 cases	11 cases 52.4%	6 cases 28.6%	4 cases 19%	
Age	Age ≤ 30 years 21 cases	10 cases 47.6%	11 cases 52.4%	-	0.41
	Age > 30 years 24 cases	12 cases 50%	8 cases 33.3%	4 cases 16.7%	
Performance status (PS)	PS 1 34 cases	21 cases 61.8%	13 cases 38.2%	-	0.10
	PS 2 11 cases	2 cases 18.2%	5 cases 45.5%	4 cases 36.3%	

P-value ≤ 0.05 is statistically significant.

Table (27): Response to chemotherapy according to fever, purpura, and lymphadenopathy:

Total number = 45 cases.

Item		Complete remission	Partial remission	Death	P-value
Fever	Yes 25 cases	10 cases 40%	13 cases 52%	2 cases 8%	0.07
	No 20 cases	13 cases 65%	5 cases 25%	2 cases 10%	
Purpura	Yes 23 cases	8 cases 34.8%	11 cases 47.8%	4 cases 17.4%	0.04
	No 22 cases	15 cases 68.2%	7 cases 31.8%	-	
Lymph-adenopathy	Yes 16 cases	8 cases 50%	6 cases 37.5%	2 cases 12.5%	0.92
	No 29 cases	15 cases 51.7%	12 cases 41.4%	2 cases 6.9%	

P-value $\leq$ 0.05 is statistically significant.

Table (28): Response to chemotherapy according to hemoglobin level, platelets count, total leucocytic count (TLC), and blast cells percentage in blood and bone marrow in study group at presentation:

Total number = 45 cases.

Item	Complete remission Mean ± SD	Partial remission Mean ± SD	Death Mean±SD	P-value
Hemoglobin gm/dl	6.8 ± 3.9	6.1 ± 2.7	5.3 ± 3.6	0.43
Platelets thousands/ml	96.5 ± 39.7	87.3 ± 54.1	81.2 ± 63.7	0.44
TLC thousands/ml	23.7 ± 13.4	49.6 ± 32.7	70.2 ± 37.2	0.01
Blast cells % in blood	25.3 ± 13.9	45.1 ± 27.3	43.9 ± 30.6	0.02
Blast cells % in bone marrow	35.2 ± 16.9	46.7 ± 35.1	49.1 ± 31.7	0.04

P-value ≤ 0.05 is statistically significant.

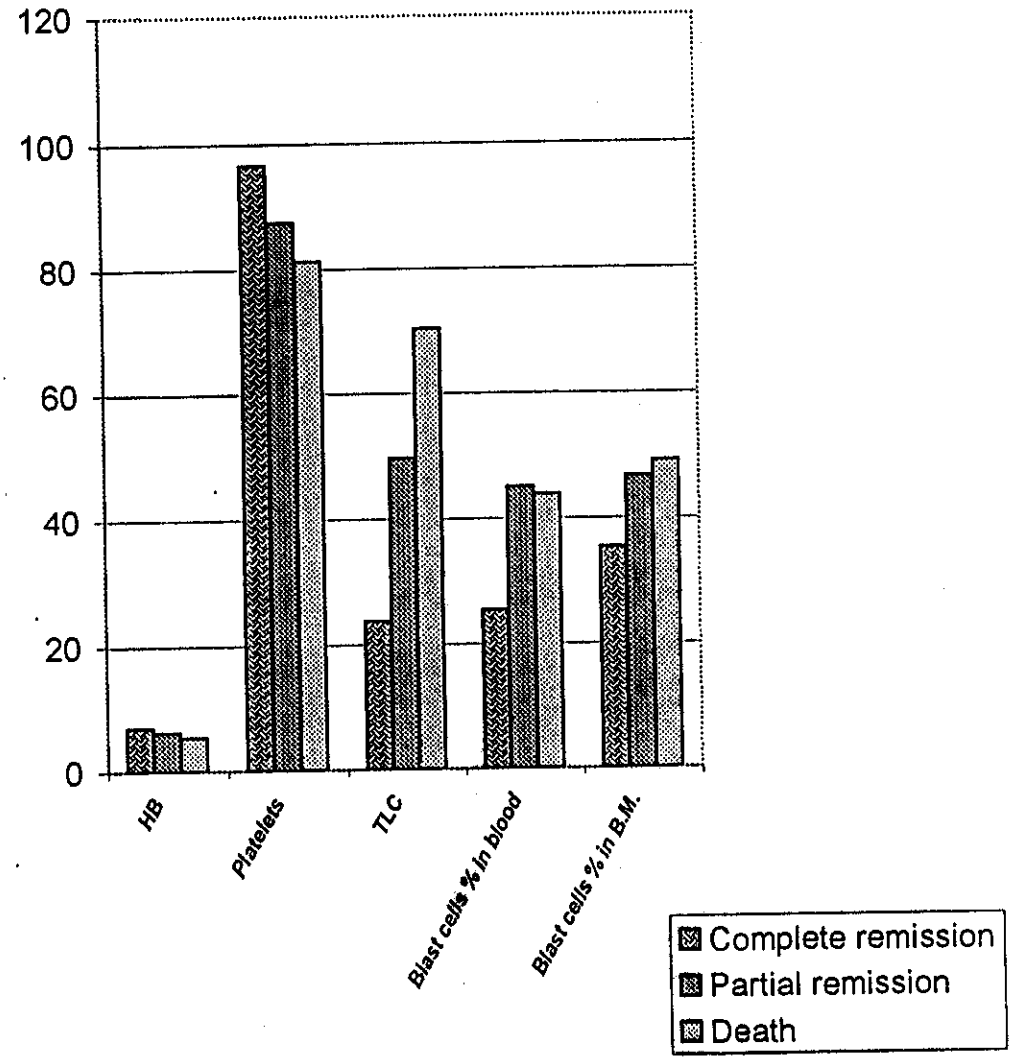


Figure (24): Comparison of hemoglobin level, platelets count, total leucocytic count (TLC), blast cells percentage in both blood and bone marrow among patients with complete remission, partial remission, and those who died during the course of chemotherapy.

Total (29): Response to chemotherapy and different FAB subtypes in study group:

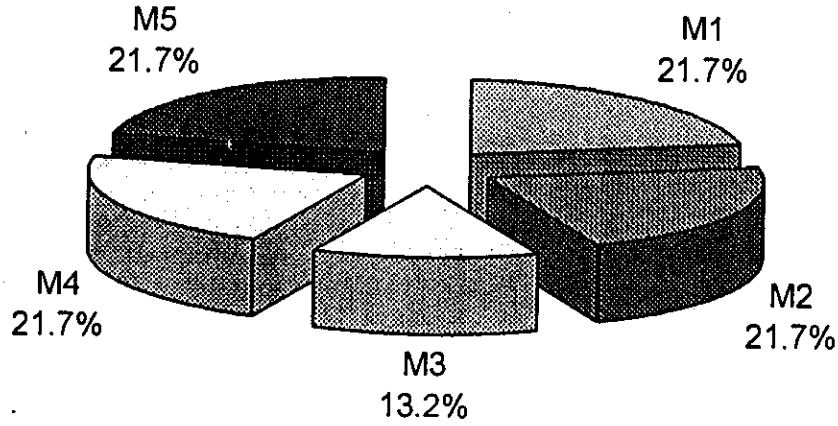
Total number = 45 cases.

Item	M1	M2	M3	M4	M5
Complete remission 23 cases	5 cases 21.7%	5 cases 21.7%	3 cases 13.2%	5 cases 21.7%	5 cases 21.7%
Partial remission 18 cases	5 cases 27.8%	5 cases 27.8%	4 cases 22.2%	2 cases 11.1%	2 cases 11.1%

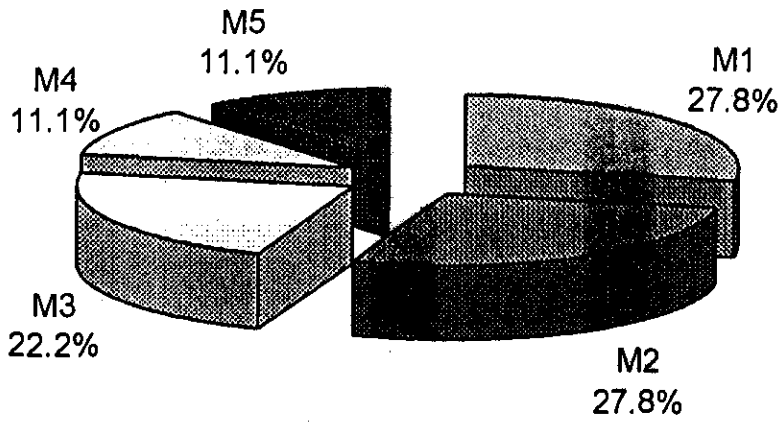
Table (30): Response to chemotherapy and IL-6, IL-8, TNF-α, and sFas levels in study group at presentation:

Tem	Complete remission	Partial remission	Death	P-value
IL-6ng/ml Mean ± SD	12.9 ± 9.1	14.9 ± 8.9	14.2 ± 9.1	0.22
IL-8 ng/ml Mean ± SD	3.1 ± 1.1	3.5 ± 2.1	3.5 ± 1.7	0.81
TNF-α ng/ml Mean ± SD	48.7 ± 36.3	59.2 ± 17.4	57.1 ± 23.8	0.15
sFas pg/ml Mean ± SD	997.0 ± 297.0	933.0 ± 304.0	951.0 ± 311.0	0.28

P-value ≤ 0.05 is statistically significant.



Complete remission



Partial remission

Figure (25): Percentage of FAB subtypes in both patients with complete remission and those with partial remission.

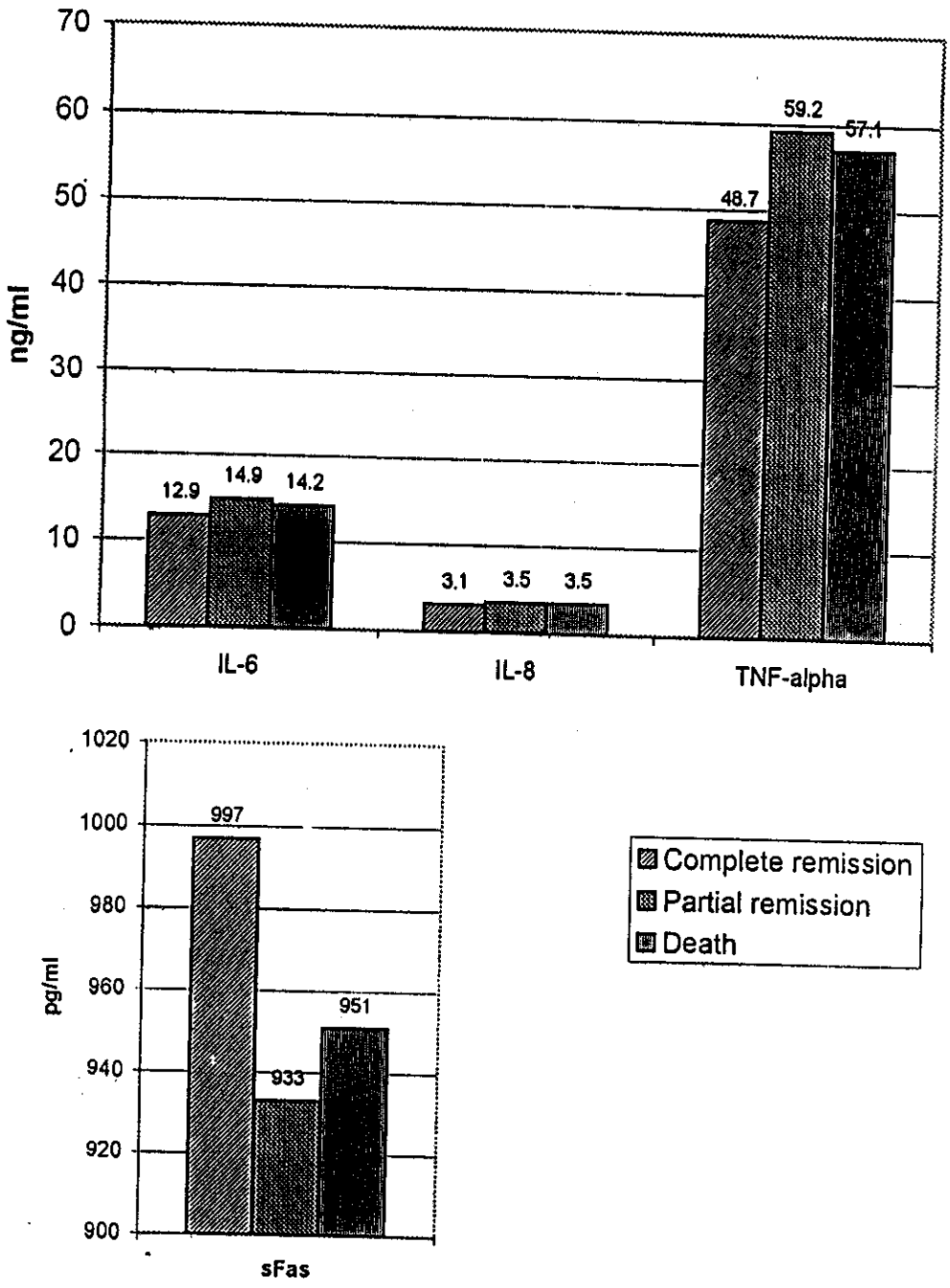


Figure (26): Comparison of IL-6, IL-8, TNF-alpha, and sFas levels among patients with complete remission, partial remission, and patients who died during the course of chemotherapy.

Table (31): Statistical comparison of different laboratory parameters 2 weeks after the end of chemotherapy with that of patients at presentation:

Parameter	At presentation Men ± SD	2 weeks after end of chemotherapy Mean ± SD	P-value
Hemoglobin gm/dl	6.9 ± 3.1	4.9 ± 1.7	0.03
RBCs millios/ml	2.1 ± 1.5	1.3 ± 0.7	0.02
TLC thousands/ml	42.7 ± 20.5	1.9 ± 1.5	0.001
Platelets thousands/ml	66.7 ± 35.9	39.6 ± 19.7	0.013
Blast cells % in blood	48.3 ± 37.7	4.9 ± 3.7	0.001
Blast cells % in B.M	61.7 ± 29.6	8.1 ± 6.3	0.001
IL-6 ng/ml	13.2 ± 8.8	12.8 ± 9.1	0.67
IL-8 ng/ml	3.5 ± 1.6	3.8 ± 1.6	0.14
TNF-α ng/ml	51.9 ± 22.8	32.5 ± 15.3	0.01
sFas pg/ml	955.4 ± 288.9	1015.2 ± 268.5	0.42

P-value ≤ 0.05 is statistically significant.

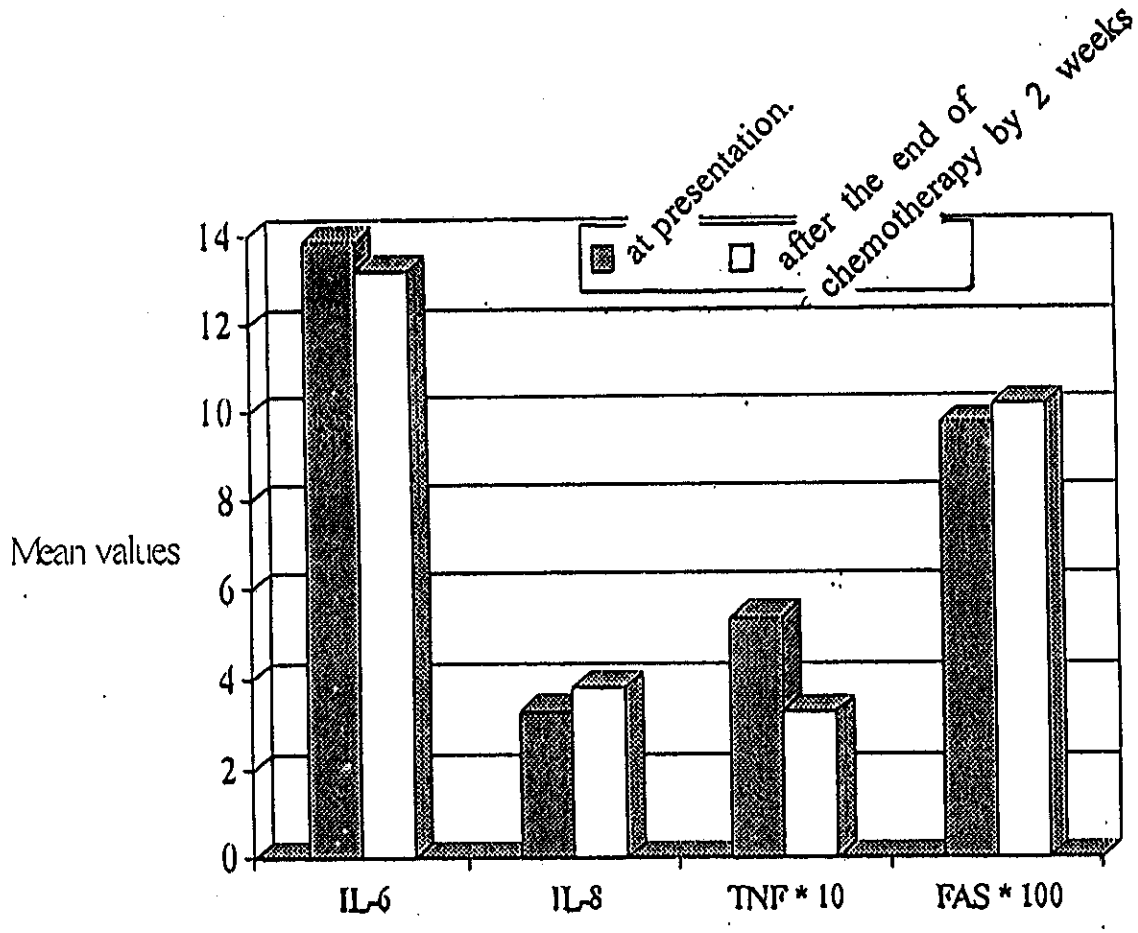


Figure (27): Statistical comparison of IL-6, IL-8, TNF-alpha, and sFas levels 2 weeks after the end of chemotherapy with that of patients at presentation.

Table (32): Statistical comparison of different laboratory parameters 2 weeks after end of chemotherapy with that of control group:

Parameter	Control group Men ± SD	2 weeks after end of chemotherapy Mean ± SD	P-value
Hemoglobin gm/dl	13.1 ± 4.9	4.9 ± 1.7	0.009
RBCs millios/ml	5.12 ± 1.7	1.3 ± 0.7	0.01
TLC thousands/ml	5.3 ± 1.54	1.9 ± 1.5	0.02
Platelets thousands/ml	317.0 ± 95.0	39.6 ± 19.7	0.001
Blast cells % in blood	-	4.9 ± 3.7	0.000
Blast cells % in B.M	-	8.1 ± 6.3	0.000
IL-6 ng/ml	6.1 ± 0.9	12.8 ± 9.1	0.03
IL-8 ng/ml	2.6 ± 0.9	3.8 ± 1.6	0.09
TNF-α ng/ml	32.1 ± 8.5	32.5 ± 15.3	0.91
sFas pg/ml	711.2 ± 106.3	1015.2 ± 268.5	0.03

P-value ≤ 0.05 is statistically significant.

Table (33): Response to chemotherapy according to various combinations of IL-6 > 8.2 ng/ml, IL-8 > 4.2 ng/ml, TNF-α > 45.1 ng/ml, and sFas > 812 pg/ml in study group at presentation:

Total number = 45 cases.

Item		Complete remission 23 cases	Partial remission 18 cases	P-value
IL-6 and TNF-α	Both IL-6 > 8.2 ng/ml and TNF-α > 45.1 ng/ml	4 cases 17.4%	10 cases 55.6%	0.01
	None, or either IL-6>8.2 ng/ml or TNF-α > 45.1 ng/ml	19 cases 82.6%	8 cases 44.4%	
IL-6 and sFas	Both IL-6 > 8.2 ng/ml and sFas > 812 pg/ml	8 cases 34.8%	7 cases 38.9%	0.90
	None, or either IL-6>8.2ng/ml or sFas > 812 pg/ml	15 cases 65.2%	11 cases 61.1%	
IL-8 and TNF-α	Both IL-8 > 4.2 ng/ml and TNF-α > 45.1 ng/ml	-	2 cases 11.1%	0.19
	None, or either IL-8 >4.2ng/ml and TNF-α > 45.1 ng/ml	23 cases 100%	16 cases 88.9%	
IL-8 and sFas	Both IL-8 > 4.2 ng/ml and sFas > 812 pg/ml	2 cases 8.7%	2 cases 11.1%	0.90
	None, or either IL-8 >4.2ng/ml or sFas > 812 pg/ml	21 cases 91.3%	16 cases 88.9%	
TNF-α and sFas	Both TNF-α > 45.1 ng/ml and sFas > 812 pg/ml	8 cases 34.8%	7 cases 38.9%	0.79
	None, or either TNF-α >45.1 ng/ml or sFas > 812 pg/ml	15 cases 65.2%	11 cases 61.1%	

P-value ≤ 0.05 is statistically significant.