# RESULTS

## I- History and examination :

Group I comprised forty patients with ages between 16 - 45 years (mean = 22.4 and SD = 6.54). Of the forty patients, four were married, three were lactating, and one was pregnant. None of the cases had received contraceptive pills. Menstrual cycle was irregular in seven cases (Table 4).

Five patients of this group gave a family history of diffuse hair loss (Table 5).

In the present history the onset was gradual in 37 patiens and it was acute in the remaining 3 patients. The duration of hair loss was ranging from one week to five years. In all cases was no history of thyroid swelling. Only three patients gave a history of nutritional deficiency, eight patients showed hair loss with pallor, seborrhea was also, reported in eight patients (Table 6).

Fever was present in four patients, one patient gave a history of surgical operation before hair loss by 3 years, seven patients had psychic stress while a history of drug intake was reported in five patiens (Table 7).

On examination of this group, the light hair pull test was positive in 32 patients (Table 8). The hair plucking test showed an anagen / telogen ratio of 80.1 to 20.4 (Table 9).

Group II (control group) comprised 20 normal females with ages between 15 to 39 years (Mean = 20.8 years and SD = 5.6 year). Two of them were married and all were not lactating or pregnant at the time of the study. Menstrual cycle was regular in all cases. None of them had received contraceptive pills.

No family hsitory of hiar loss was reported. There was no history of fever, surgical operation, psychic stress and drug intake. There was no history suggesting nutritional deficiency, there was no pallor, thyroid swelling or seborrhea.

On examination of this group, the light hair pull test was normal in all cases and the hair plucking test showed an anagen / telogen ratio of 92 to 8.3 (mean value).

**II - Laboratory results :**

**(a) Serum testosterone :**

Serum testosterone levels in group I ranged from 5.1 to 709.3 ng/dl (mean = 111.84 ng/d and SD = 161.25 ng/dl) Table (10). In the control group serum testosteron ranged from 17.8 to 89.3 ng/dl (mean = 41.49 ng/dl) and (SD = 18.91 ng/dl). Table (11).

**(b) Estimation of $T_4$ in serum :**

In the patients of group I, the levels of $T_4$ in the serum ranged from 5.18 to 11.4 ug/dl (mean = 7.73 ug/dl) and (SD = 1.45 µg/dl).

In the control group $T_4$ in serum ranged from 5.77 to 10.51 µg/dl (mean = 7.58 µg/dl and SD = 1.37 µg/dl) Table (11).

**(c ) Estimation of $T_3$ in serum :**

In the patients of group I, the levels of $T_3$ in the serum ranged from 82.21 to 173.62 ng/dl (mean = 120.5 and SD = 27.2 ng/dl) (Table 10).

In the control group, the levels of $T_3$ in the serum ranged from 86.87 to 188.12 ng/dl (mean = 133.39 ng/dl and SD = 20.7 ng/dl) (Table 11).

**(d) Estimation of serum zinc :**

The levels of the serum zinc in the patients of group I ranged from 6 to 147 ug/dl (mean = 48.4 ug/dl and SD = 37.2 ug/dl) (Table 10).

In the control group, the levels of serum zinc ranged from 40 to 166 µg/dl (mean = 89.55 ug/dl and SD = 25.7 ug/dl) (Table 11).

**(e) Estimation of serum iron :**

In the patients of group I, the level of serum iron ranged from (8.19 to 620.2 µg/dl) (mean = 168.21 µg/dl and SD = 181.23 µg/dl). In the control group the levels of serum iron ranged from 18.3 to 282.1 µg/dl (mean = 87.3) µg/dl and SD = 61.18 µg/dl) (Table 11).

**III - Results of scalp biopsy :**

In the ten cases with diffuse hair loss, the average biopsy specimen contained 40 hairs, with 35 terminal and 5 vellus hairs, a 7 : 1 ratio, 88% of terminal hairs were in the anagen phase and 12% were in telogen. On the basis of the degree of inflammation or fibrosis, the patients showed mild perifollicular inflammation or fibrosis in 40.9% of cases while the remaining patients (59.1%) showed no perifollicular inflammation or fibrosis. The inflammatory infiltrate was composed mainly of lymphocytes

and histiocytes, other cells such as neutrophils, plasma cells, were seen occasionally. The perifollicular fibrosis was generally mild, consisting of loose, concentric layers of fibrotic collagen.

**Table (4):** Distribution of studied groups according to personal history.

| Group | GI | | GII | |
|---|---|---|---|---|
| Lactation | No. | % | No. | % |
| No | 37 | 92.5 | 20 | 100.0 |
| Yes | 3 | 7.5 | 0 | 0.0 |
| Total | 40 | 100.0 | 20 | 100.0 |
| Pregnancy | | | | |
| No | 39 | 97.5 | 20 | 100.0 |
| Yes | 1 | 2.5 | 0 | 0.0 |
| Total | 40 | 100.0 | 20 | 100.0 |
| Oral contraception | | | | |
| No | 40 | 100.0 | 20 | 100.0 |
| Yes | 0 | 0.0 | 0 | 0.0 |
| Total | 40 | 100.0 | 20 | 100.0 |
| Menstrual rhythm | | | | |
| - No menstruation | 1 | 2.5 | 0 | 0.0 |
| - Regular | 32 | 80.0 | 20 | 100.0 |
| -Irregular | 7 | 17.5 | 0 | 0.0 |
| - Total | 40 | 100.0 | 20 | 100.0 |

**Table (5):** Distribution of studied groups according to family history.

| Group | GI | | GII | |
|---|---|---|---|---|
| Family history | No. | % | No. | % |
| Positive | 5 | 12.5 | 2 | 10 |
| Negative | 35 | 87.5 | 18 | 90 |
| Total | 40 | 100.0 | 20 | 100.0 |

**Table (6):** Distribution of studied groups according to present history.

| Group | GI | | GII | |
|---|---|---|---|---|
| Onset | No. | % | No. | % |
| - Gradual | 37 | 92.5 | - | - |
| - Acute | 3 | 7.5 | - | - |
| - Total | 40 | 100.0 | - | - |
| Thyroid swelling | | | | |
| - No | 40 | 100.0 | 20 | 100.0 |
| - Yes | 0 | 0.0 | 0 | 0.0 |
| - Total | 40 | 100.0 | 20 | 100.0 |
| Nutritional deficiency | | | | |
| - No | 37 | 92.5 | 20 | 100.0 |
| - Yes | 3 | 7.5 | 0 | 0.0 |
| - Total | 40 | 100.0 | 20 | 100.0 |
| Pallor | | | | |
| - No | 32 | 80.0 | 20 | 100.0 |
| - Yes | 8 | 20.0 | 0 | 0.0 |
| - Total | 40 | 100.0 | 20 | 100.0 |
| Seborrhea | | | | |
| - No | 32 | 80.0 | 20 | 100.0 |
| - Yes | 8 | 20.0 | 0 | 0.0 |
| - Total | 40 | 100.0 | 20 | 100.0 |

**Table (7):** Distribution of studied groups according to past history.

| Group | GI | | GII | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Fever | | | | |
| - No | 36 | 90.0 | 20 | 100.0 |
| - Yes | 4 | 10.0 | 0 | 0.0 |
| - Total | 40 | 100.0 | 20 | 100.0 |
| Surgical operations | | | | |
| - No | 39 | 97.5 | 20 | 100.0 |
| - Yes | 1 | 2.5 | 0 | 0.0 |
| - Total | 40 | 100.0 | 20 | 100.0 |
| Psychic stress | | | | |
| - No | 33 | 82.5 | 20 | 100.0 |
| - Yes | 7 | 17.5 | 0 | 0.0 |
| - Total | 40 | 100.0 | 20 | 100.0 |
| Drug intake | | | | |
| - No | 35 | 87.5 | 20 | 100.0 |
| - Yes | 5 | 12.5 | 0 | 0.0 |
| - Total | 40 | 100.0 | 20 | 100.0 |

**Table (8):** Light hair pull test of both groups.

| Group | GI | | GII | |
|---|---|---|---|---|
| Light hair pull test | No. | % | No. | % |
| - Normal | 8 | 20.0 | 20 | 100.0 |
| - Positive | 32 | 80.0 | 0 | 0.0 |
| -Total | 40 | 100.0 | 20 | 100.0 |

**Table (9):** Mean and standard deviation of hair pluck test of both groups.

| Group / Parameter | GI no. = 40 X ± SD | GII no. = 20 X ± SD | t | P |
|---|---|---|---|---|
| Hair pluck | | | | |
| * Anagen | 80 ± 11.8 | 92 ± 24 | 5.98 | <0.001 |
| * Telogen | 20 ± 9.6 | 8 ± 2.4 | 7.25 | < 0.001 |

**Table (10):** Different parameters (investigations) in group I

| No. | Testosterone | Thyroxine | Triiodothyronine | Zinc | Iron |
|---|---|---|---|---|---|
| 1 | 11.6 | 8.66 | 148.2 | 121 | 39.2 |
| 2 | 245.1 | 5.64 | 86.84 | 58 | 10.4 |
| 3 | 12.4 | 10.17 | 167.06 | 54 | 21.4 |
| 4 | 33.7 | 6.82 | 107.39 | 23 | 122.1 |
| 5 | 185.7 | 5.33 | 82.68 | 98 | 135.7 |
| 6 | 147.3 | 6.89 | 88.18 | 92 | 17.8 |
| 7 | 126.0 | 6.66 | 96.44 | 7 | 139.2 |
| 8 | 5.5 | 8.04 | 127.63 | 25 | 335.7 |
| 9 | 98.6 | 11.14 | 142.57 | 29 | 185.2 |
| 10 | 709.3 | 7.82 | 156.44 | 53 | 577.5 |
| 11 | 27.4 | 7.45 | 100.48 | 8 | 364.3 |
| 12 | 55.5 | 6.63 | 121.05 | 74 | 65.8 |
| 13 | 24.4 | 6.63 | 82.21 | 21 | 244.5 |
| 14 | 61.5 | 5.18 | 90.07 | 73 | 612.4 |
| 15 | 57.2 | 8.25 | 107.72 | 147 | 527.1 |
| 16 | 129.8 | 6.34 | 108.09 | 101 | 317.8 |
| 17 | 30.4 | 6.74 | 144.01 | 80 | 383.7 |
| 18 | 36.2 | 7.26 | 144.04 | 6 | 364.3 |
| 19 | 155.9 | 6.50 | 93.33 | 58 | 139.6 |
| 20 | 43.1 | 7.95 | 131.04 | 21 | 27.3 |
| 21 | 20.5 | 9.44 | 171.75 | 25 | 16.4 |
| 22 | 26.2 | 9.86 | 118.81 | 44 | 87.4 |
| 23 | 516.0 | 8.88 | 133.00 | 8 | 383.7 |
| 24 | 18.9 | 7.75 | 89.68 | 16 | 8.19 |
| 25 | 22.0 | 9.31 | 123.86 | 7 | 24.5 |
| 26 | 24.7 | 6.21 | 108.37 | 61 | 44.1 |
| 27 | 61.8 | 6.45 | 145.92 | 18 | 620.2 |
| 28 | 8.5 | 8.50 | 158.98 | 20 | 245.9 |
| 29 | 60.2 | 5.97 | 135.48 | 120 | 13.6 |
| 30 | 18.6 | 11.4 | 112.99 | 86 | 38.2 |
| 31 | 14.4 | 7.52 | 134.92 | 50 | 38.4 |
| 32 | 412.4 | 8.44 | 110.61 | 30 | 54.6 |
| 33 | 73.1 | 8.75 | 156.73 | 44 | 92.8 |
| 34 | 48.9 | 7.92 | 144.37 | 14 | 37.7 |
| 35 | 34.7 | 8.89 | 88.77 | 110 | 24.5 |
| 36 | 227.5 | 6.27 | 100.29 | 83 | 79.2 |
| 37 | 5.1 | 7.68 | 98.75 | 11 | 32.7 |
| 38 | 57.5 | 7.00 | 96.07 | 16 | 16.3 |
| 39 | 56.9 | 8.66 | 173.62 | 62 | 96.3 |
| 40 | 568.3 | 6.14 | 84.52 | 40 | 139.9 |

**Table (11):** Different laboratory investigations in Reference Group (group II).

| No. | Testosterone ng/dl | Thyroxine ug/dl | Triiodothyronine ng/dl | Zinc ug/dl | Iron ug/dl |
|---|---|---|---|---|---|
| 1 | 24.8 | 7.82 | 119.38 | 116 | 50.4 |
| 2 | 55.3 | 10.51 | 150.2 | 105 | 188.7 |
| 3 | 32.4 | 7 | 120.82 | 95 | 169.7 |
| 4 | 18 | 6.8 | 130.33 | 40 | 18.3 |
| 5 | 17.8 | 10.32 | 161.13 | 74 | 282.1 |
| 6 | 40.4 | 6.74 | 86.87 | 166 | 75.3 |
| 7 | 89.3 | 8.77 | 124.92 | 75 | 63.9 |
| 8 | 41 | 9.35 | 118.4 | 105 | 115.2 |
| 9 | 65 | 7.19 | 132.92 | 101 | 97.8 |
| 10 | 48 | 7.15 | 113.32 | 72 | 67.5 |
| 11 | 68.6 | 6.17 | 127.97 | 82 | 44.8 |
| 12 | 52.3 | 7.51 | 128.9 | 88 | 59.8 |
| 13 | 45.1 | 9.24 | 151.13 | 79.2 | 74.3 |
| 14 | 33.2 | 5.92 | 133.53 | 94.1 | 82.5 |
| 15 | 21.9 | 6.3 | 121.41 | 105.4 | 91.1 |
| 16 | 49.1 | 7.72 | 153.25 | 93.2 | 92.6 |
| 17 | 50 | 8.46 | 119.8 | 81.9 | 75.2 |
| 18 | 19.5 | 6.94 | 188.12 | 100.5 | 44.1 |
| 19 | 26.4 | 5.77 | 141.34 | 83.8 | 72.5 |
| 20 | 31.8 | 7.15 | 129.65 | 79.5 | 56.2 |

**Table (12):** Mean and standard deviation of different laboratory investigation in both studied groups.

| Group / Different investigations | GI no. = 40 X ± SD | GII no. = 20 X ± SD | t | P |
|---|---|---|---|---|
| a) Testosterone | 111.84 ± 161.25 | 41.49 ± 18.91 | 1.86 | > 0.05 |
| b) Thyroxine | 7.73 ± 1.45 | 7.58 ± 1.37 | 0.55 | > 0.05 |
| c) Triiodothyronine | 120.5 ± 27.2 | 133.39 ± 20.7 | 0.84 | > 0.05 |
| d) Zinc | 48.4 ± 37.2 | 89.55 ± 25.7 | 3.78 | **< 0.01** |
| e) Iron | 168.21 ± 181.23 | 87.3 ± 61.18 | 1.89 | > 0.05 |

**Chart (1) distribution of the studied groups according to family history**

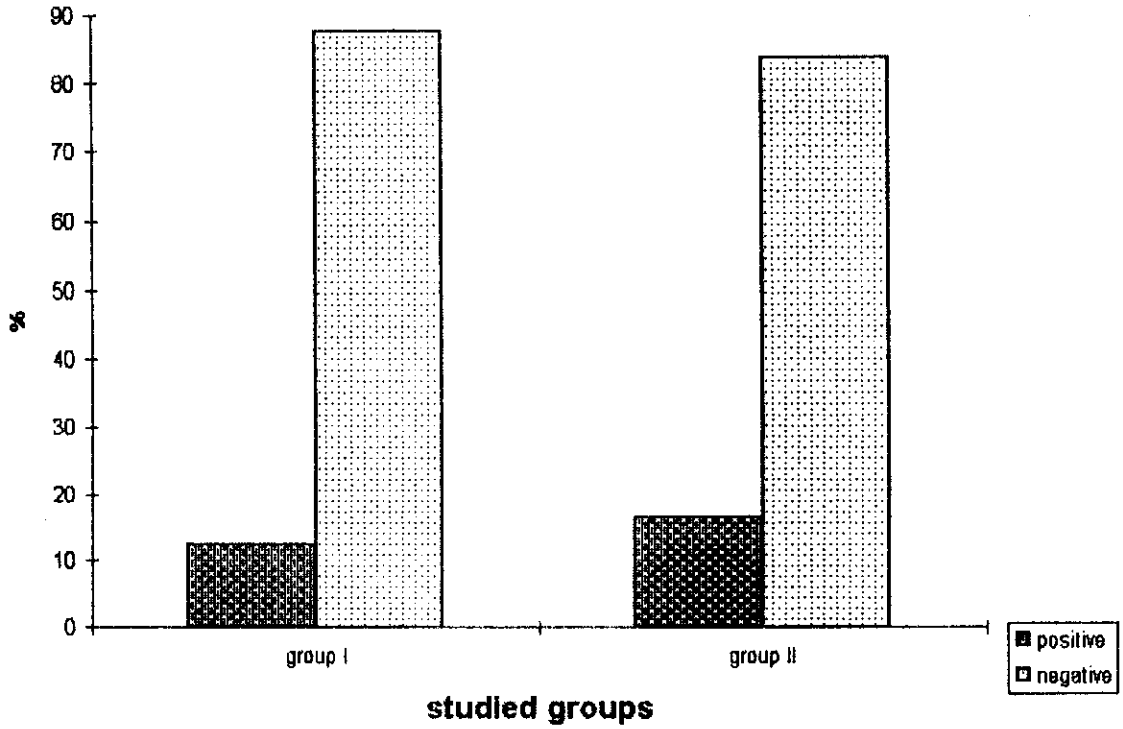
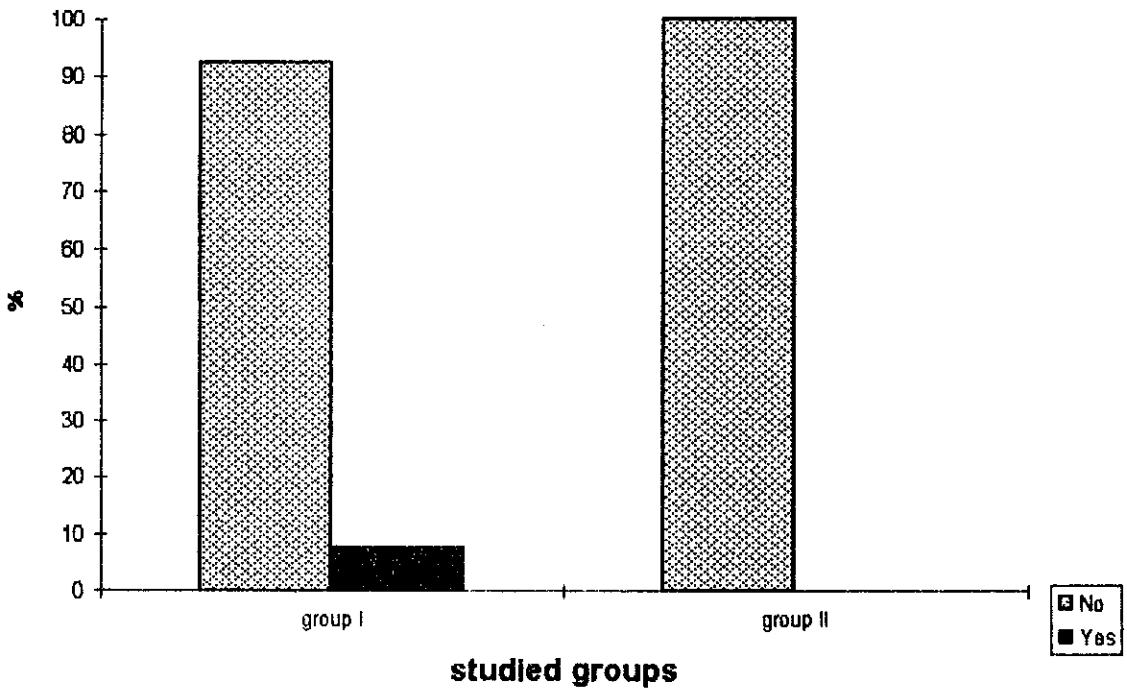
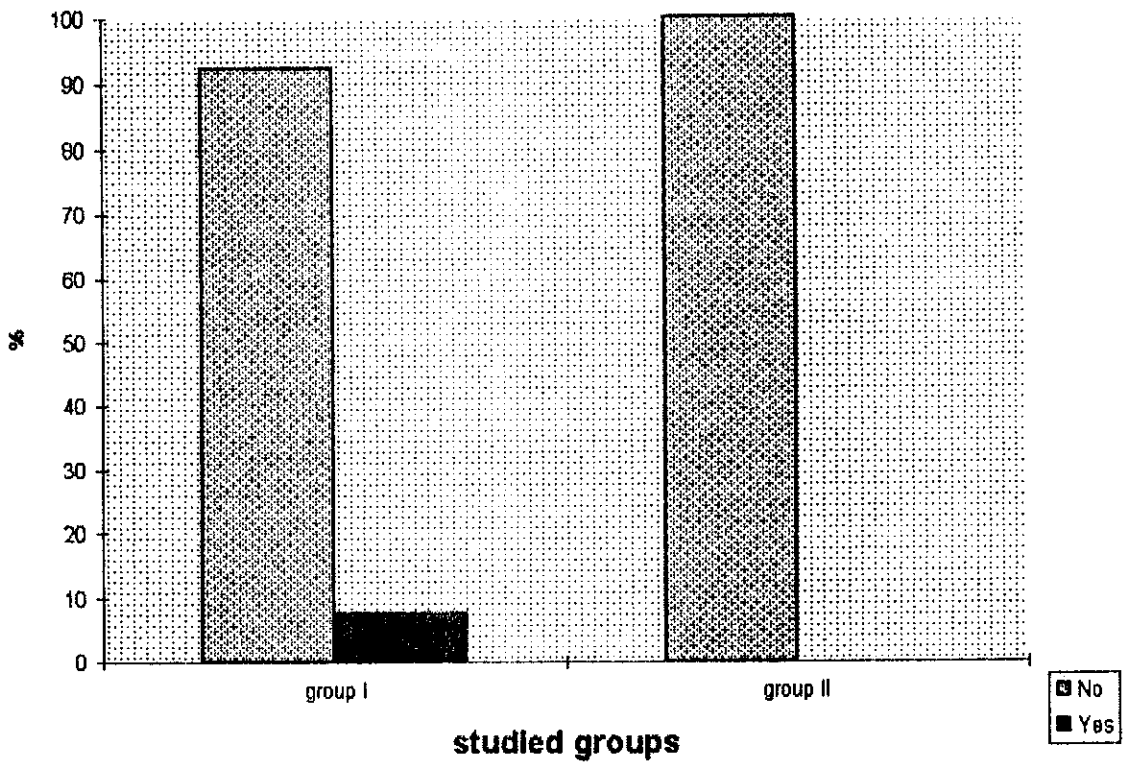



**Chart (2) distribution of the studied groups according to lactation**



## Chart (3) distribution of the studied groups according to nutritional deficiency




## Chart (4) distribution of the studied groups according to psychic stress

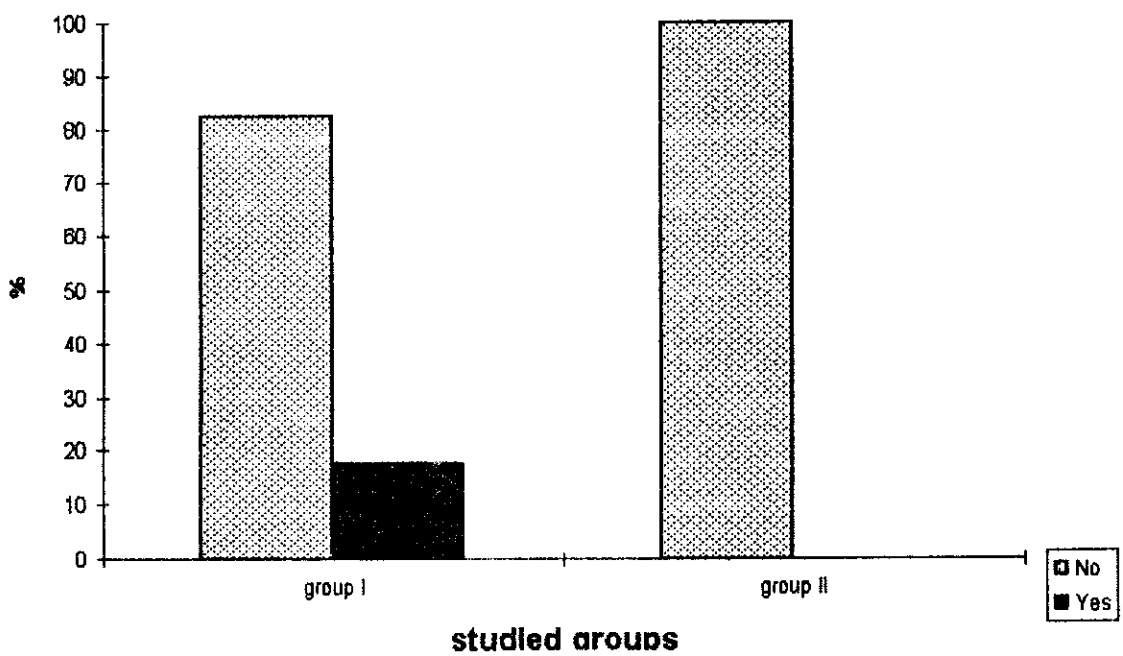


**Chart (5) distribution of the studied groups according to drug use**

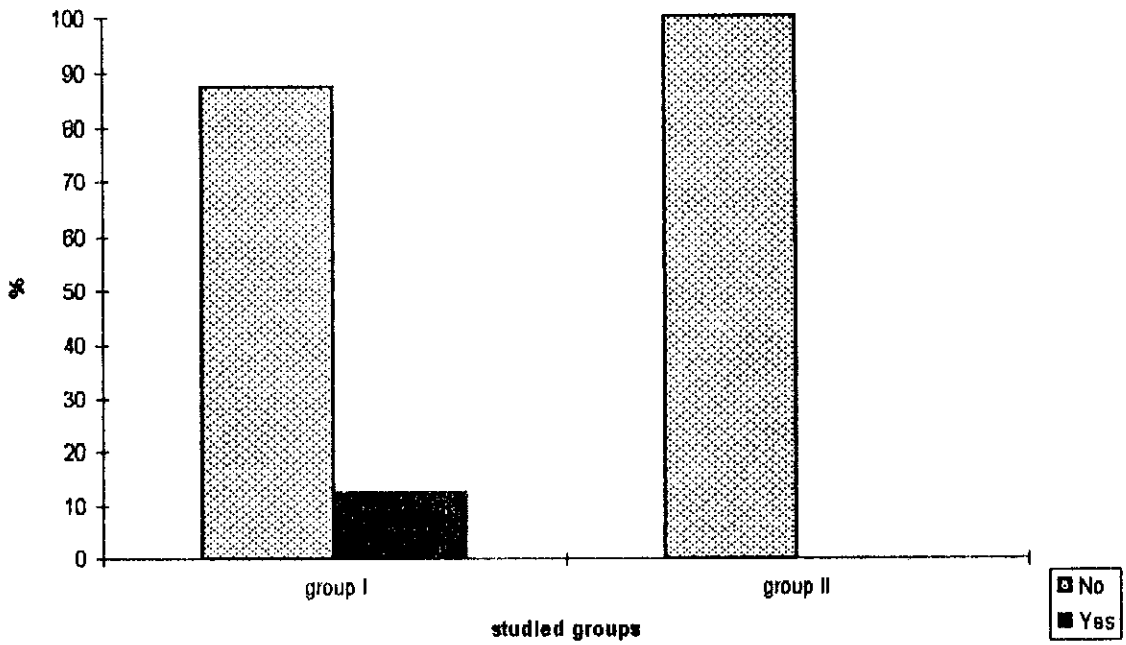
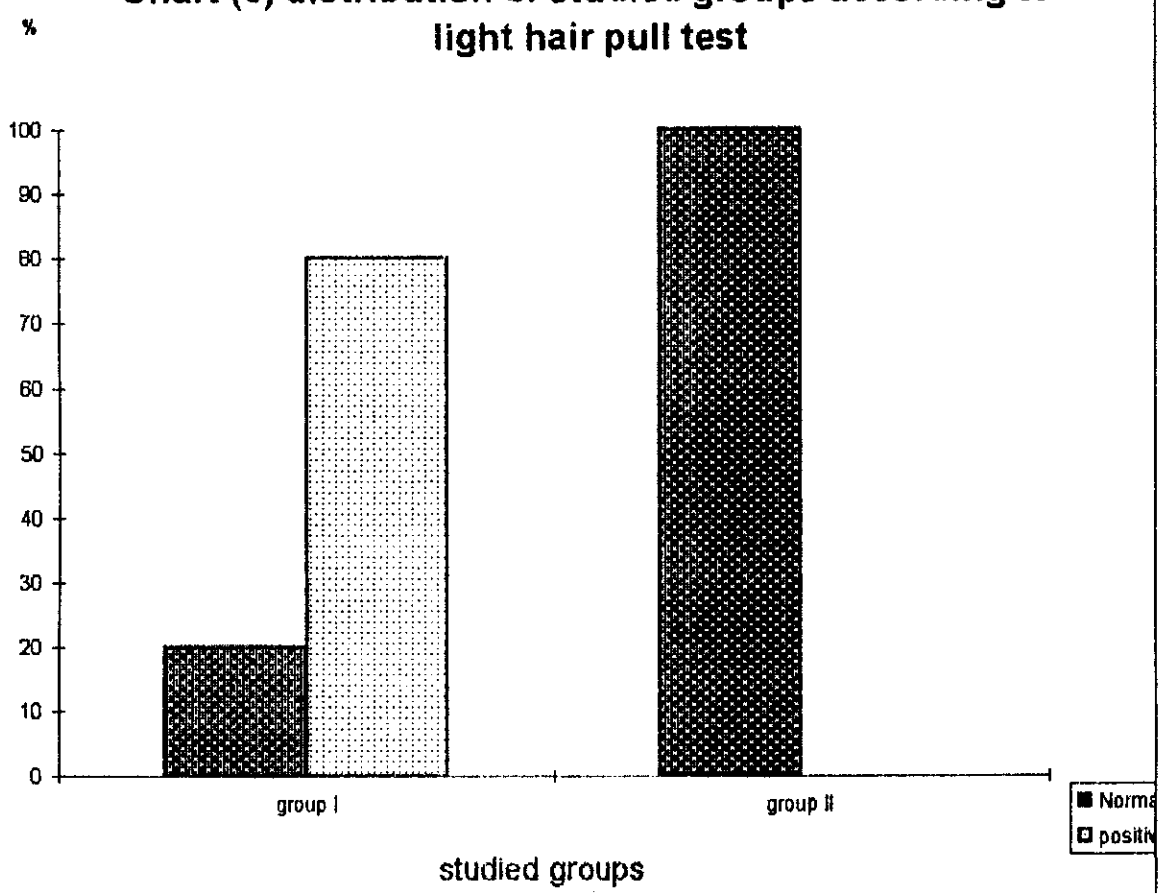



**Chart (6) distribution of studied groups according to light hair pull test**



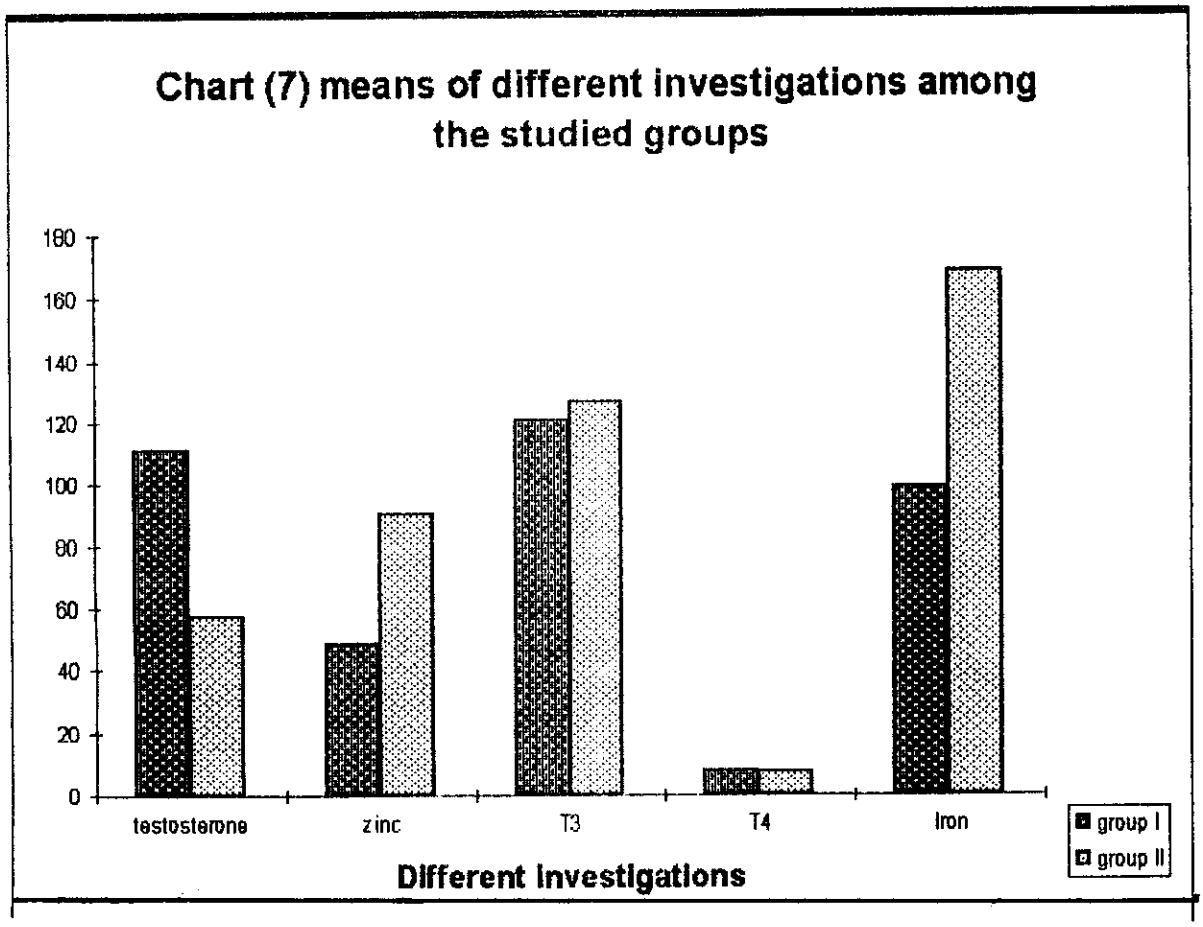


Chart (7) means of different investigations among the studied groups
180
160
140
120
100
80
60
40
20
0
testosterone
zinc
T3
T4
Iron
group I
group II
Different investigations

**Fig. (6):** The lower pole of anagen hair showing a knob like expansion of the hair bulb composed of matrix cells and melanocytes.

**Fig. (7):** A shaft of anagen hair showing regular pattern of the hair medulla surrounded by melanin pigmentation.

**Fig. (8):** Photomicrograph showing uneven distribution of hair follicle.

**Fig. (9):** Photomicrograph showing perifollicular distribution of chronic inflammatory cells around the hair follicles.

**Fig. (10):** Photomicrograph showing reduction in the number of layers of the hair follicles with irregular keratohyaline material.