RESULTS

[1] Statistical results:

A) Mean weight of animals (gm):

The mean weight of animals (gm) of group I (control group) was 189.76 ± 7.81 .

There was a significant increase in body weight of animals of +ve control group (received high fat diet) and group IIIa (received high fat diet and green tea at dose 325 mg/kg/day) compared to the control group.

There was no significant change in the body weight of animals in group IIIb (received high fat diet and green tea at dose 500 mg/kg/day) compared to the control group (Table 2 and Histogram 1).

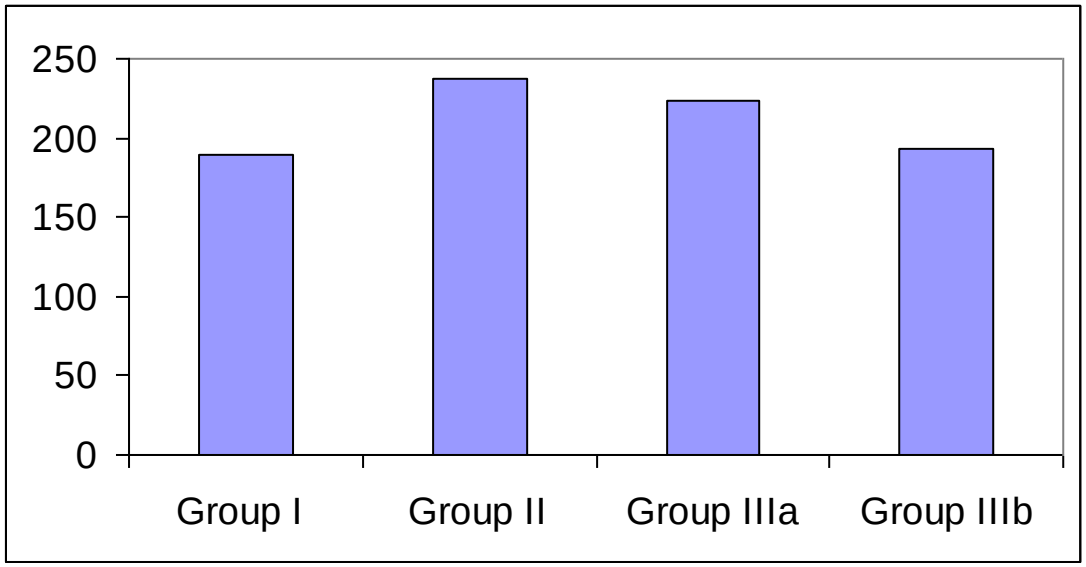
Table (2): Showing the mean weight of animals (gm) of different groups compared to control group.

	Group I n = 10	**Group II n = 10**	**Group IIIa n = 10**	**Group IIIb n = 10**
Mean	189.76	237.87	223.93	192.83
SD±	7.81	16.09	11.97	6.67
t test		6.71	5.52	2.01
P value		0.0006	0.002	0.068
Significance		S	S	NS

SD = standard deviation S = Significant

NS = non significant

Histogram 1: Showing the mean weight of animals (gm) of different groups compared with control group.



B) The mean surface area of unilocular fat cells:

The mean surface area of unilocular fat cells showed a significant increase in positive control group (group II) and group IIIa compared to the control group.

While there was no significant increase in the mean surface area in group IIIb compared to control group (Table 3 & Histogram 2).

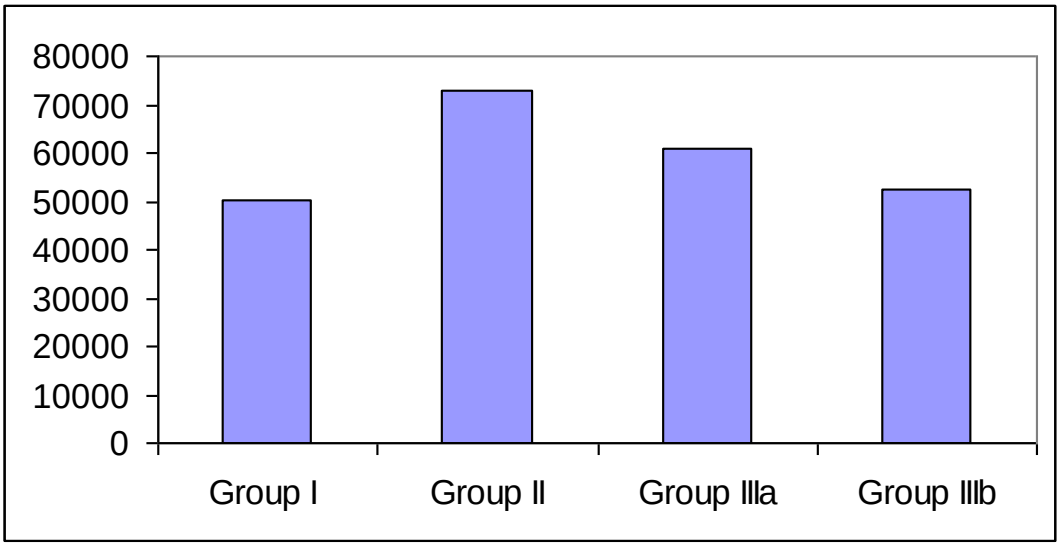
Table (3): Showing the mean surface area of unilocular fat cells (μm^2) in different groups compared to control group.

	Group I n = 10	Group II n = 10	Group IIIa n = 10	Group IIIb n = 10
Mean	50409.7	72972.3	61012.9	52402.9
SD±	3891.6	7806.4	8011.2	2932.4
t test		5.19	4.81	2.21
P value		0.0008	0.003	0.071
Significance		S	S	NS

SD= standard deviation S = Significant

NS = non significant

Histogram 2: Showing the mean area of unilocular fat cells (μm^2) in different groups compared to control group.



C) The mean number of fat cells/ high power field (HPF)

The mean fat cells number in the perinephric depot in positive control group (group II) and group IIIa showed significant increase compared to control group.

There was no significant increase in number of fat cells in group IIIb compared to control group (Table 4 & Histogram 3).

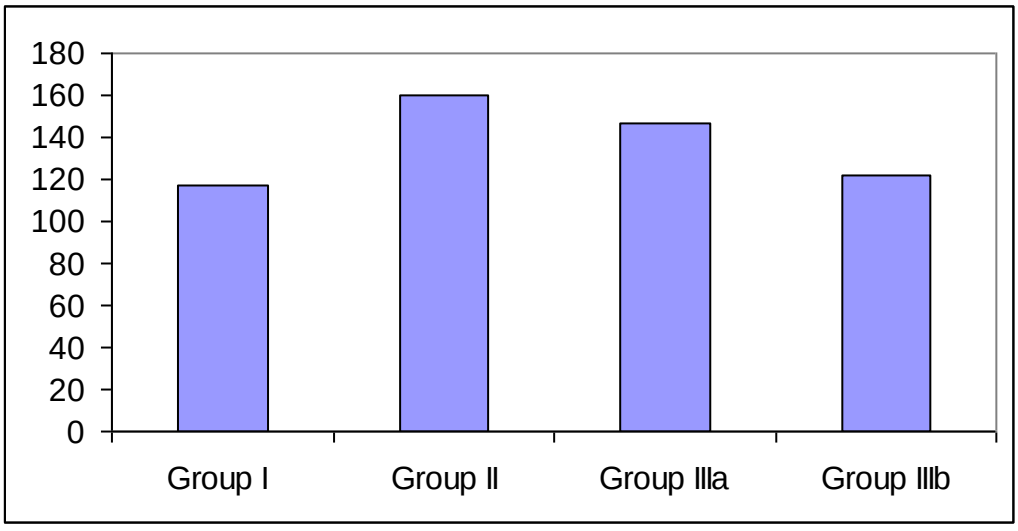
Table (4): Showing the mean number of fat cells / HPF in different groups compared to control group

	Group I n = 10	**Group II n = 10**	**Group IIIa n = 10**	**Group IIIb n = 10**
Mean	117.1	160.2	146.3	121.7
SD±	6.71	15.35	12.07	2.04
t test		6.03	4.76	1.05
P value		0.0004	0.0086	0.307
Significance		S	S	NS

SD= standard deviation S = Significant

NS = non significant

Histogram 3: Showing the mean number of fat cells/ HPF in different groups compared to control group



(2)Light microscope results

Sudan III stained sections:

- **Group I:** (control group) sections showed small unilocular adipocytes containing single small fat droplets with eccentric flattened nuclei (Fig. 5).
- **Group II :** (positive control group) sections showed closely backed and large unilocular adipocytes (Fig. 6).
- **Group IIIa:** (low dose green tea group) sections showed most of adipocytes appeared large and nearly similar to group II. (Fig. 7).
- **Group III b:** (high dose green tea group) sections showed most of adipocytes appeared small and nearly similar to control group (Fig.8).

Osmic acid stained sections:

- **Group I:** (control group) sections showed large amount of small adipocyte containing unsaturated fat which appear black (Fig. 9).
- **Group II:** (positive control group) sections showed large closely backed adipocyte containing saturated fat which appear white and few, scattered small adipocyte which containing unsaturated fat (Fig. 10).
- **Group IIIa:** (low dose green tea group) sections showed most of adipocyte appeared large, and contain white saturated fat separated by C.T septum (Fig. 11).
- **Group IIIb:** (high dose green tea group) section showed most of adipocyte small and contain black unsaturated fat (Fig. 12).

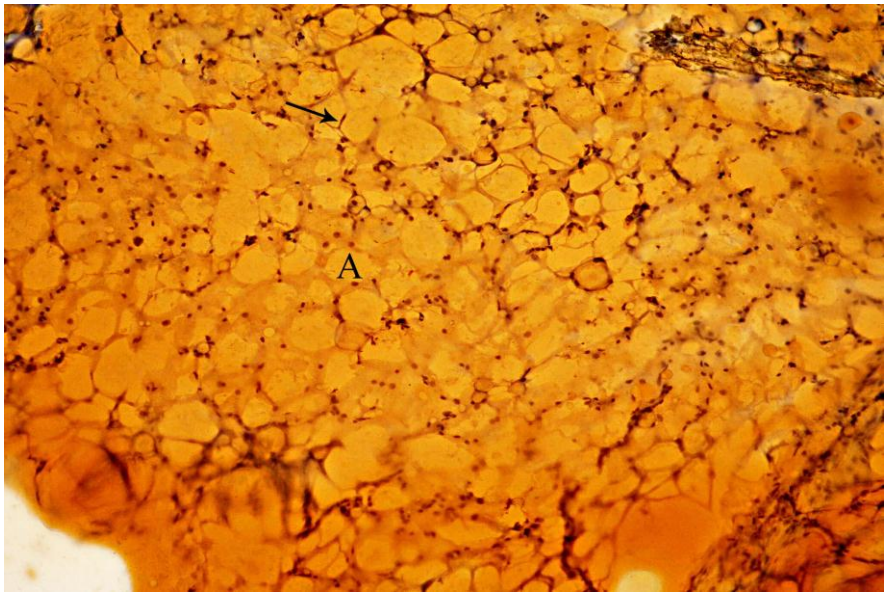


Fig. (5): A photomicrograph of a section in perinephric fat obtained from adult male albino rat of group I (control group) showing small unilocular adipocytes (A) containing single fat droplet with eccentric flattened nuclei (arrow)

[Sudan III stain proj. 10x, obj. 10x]

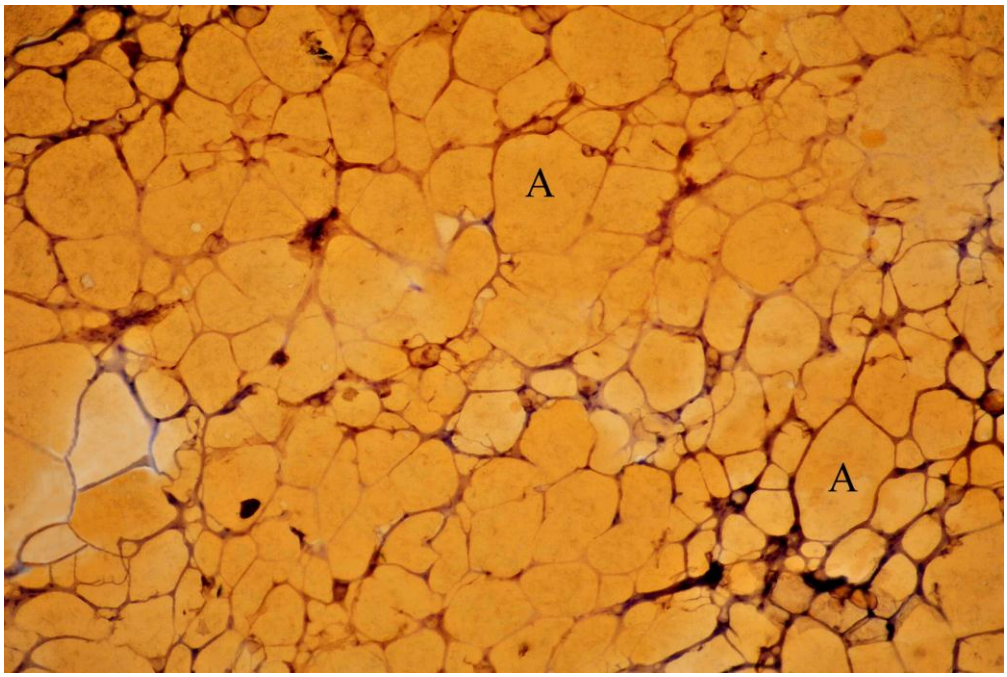


Fig. (6): A photomicrograph of a section in perinephric fat obtained from adult male albino rat of group II (+ve control group), showing large closely backed unilocular adipocytes (A).
[Sudan III stain proj. 10x, obj. 10x]

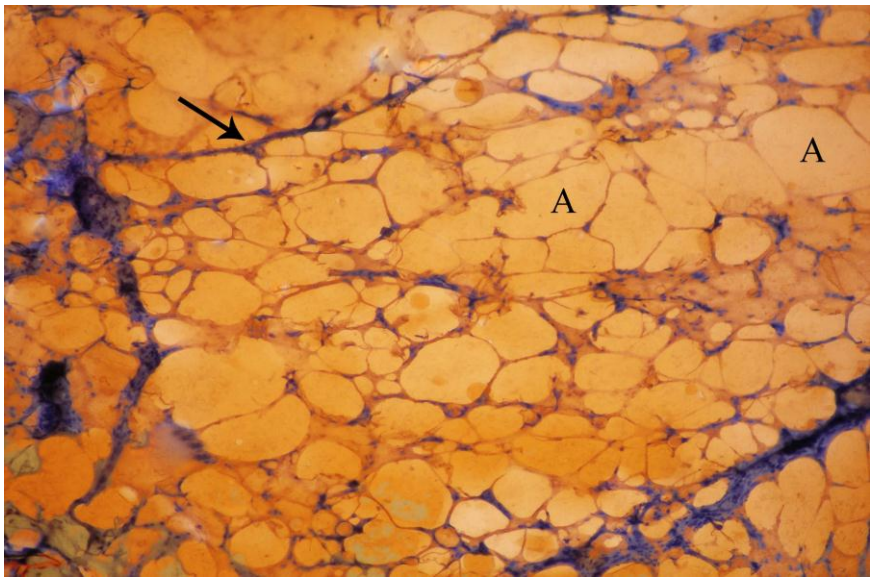


Fig. (7): A photomicrograph of a section in perinephric fat obtained from adult male albino rat of group IIIa (low lose green tea group) showing large unilocular adipocytes (A), separated by connective tissue septa (arrow).

[Sudan III stain proj. 10x, obj. 10x]

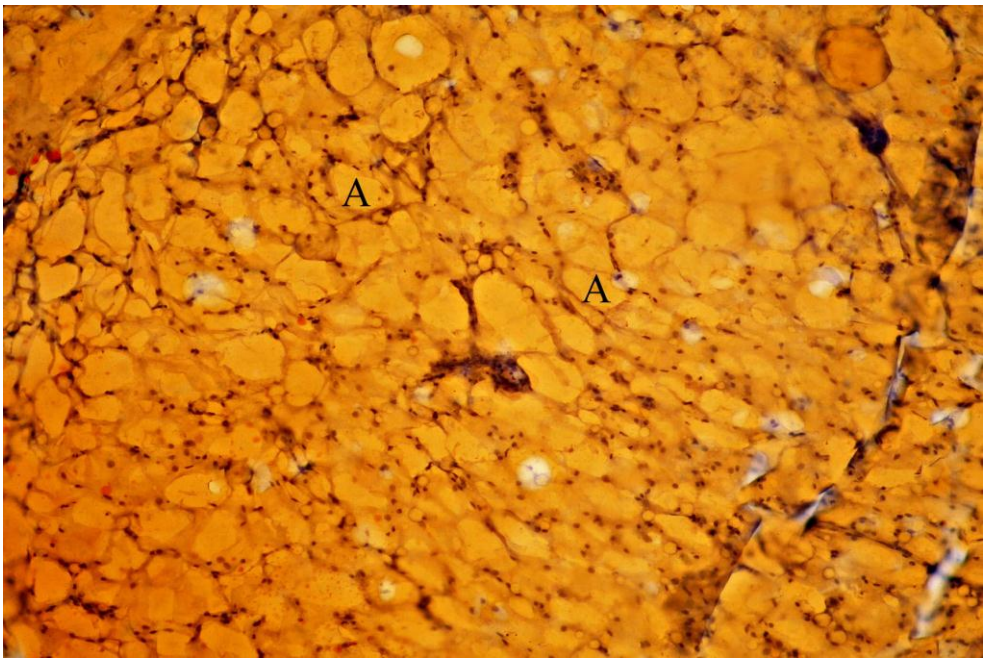


Fig (8): A photomicrograph of a section in perinephric fat obtained from adult male albino rat of group IIIb (high dose green tea group), showing small unilocular adipocytes (A)

[Sudan III stain proj. 10x, obj. 10x]

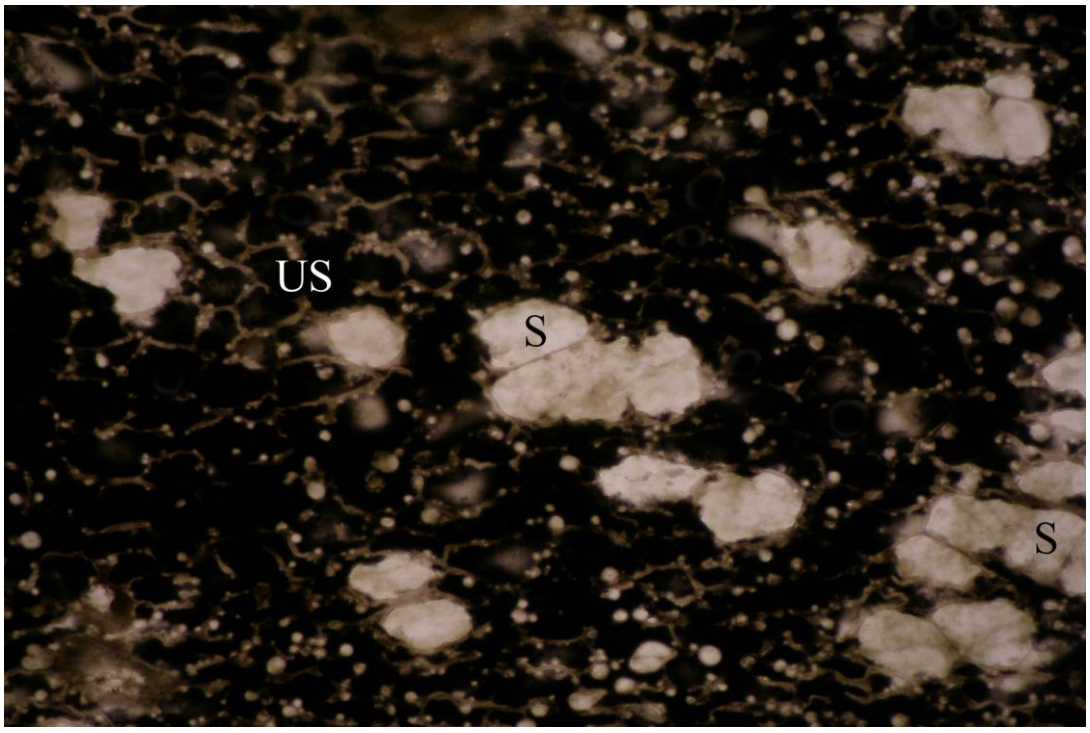


Fig (9): A photomicrograph of a section in perinephric fat obtained from adult male albino rat of group I (control group) showing many small dark stained (black) adipocyte which contain unsaturated fat (US) and few large white adipocyte which contain saturated fat (S).

[Osmic acid stain proj. 10x, obj. 10x]

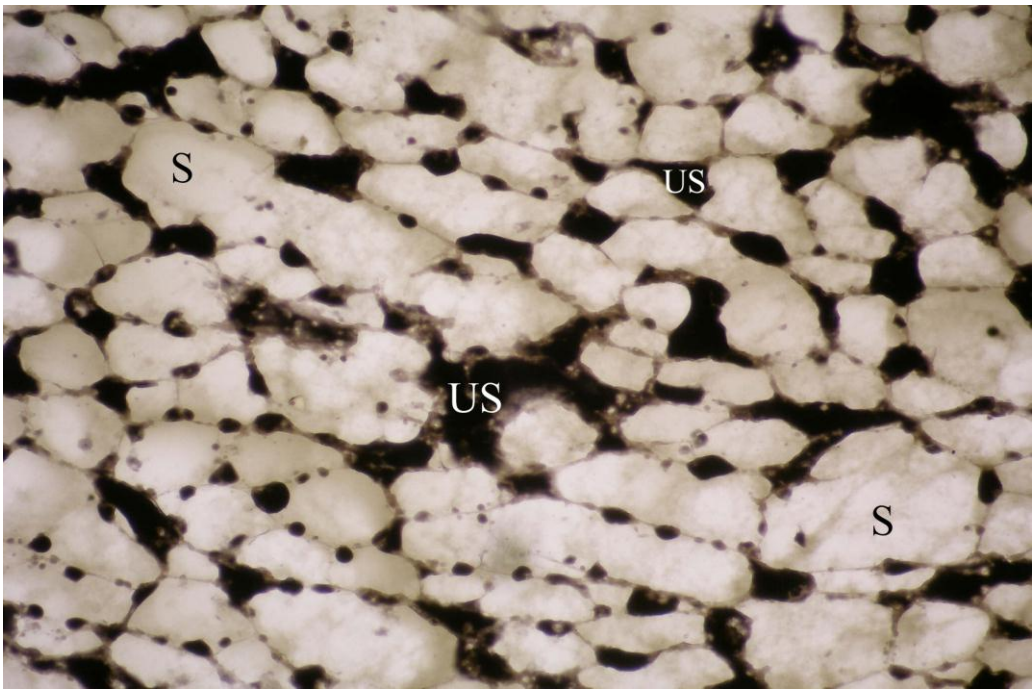


Fig (10): A photomicrograph of a section in perinephric fat obtained from adult male albino rat of group II (+ve control group) showing large white adipocytes which contain saturated fat (S) and few small black cells which contain unsaturated fat (US).

[Osmic acid stain proj. 10x, obj. 10x]

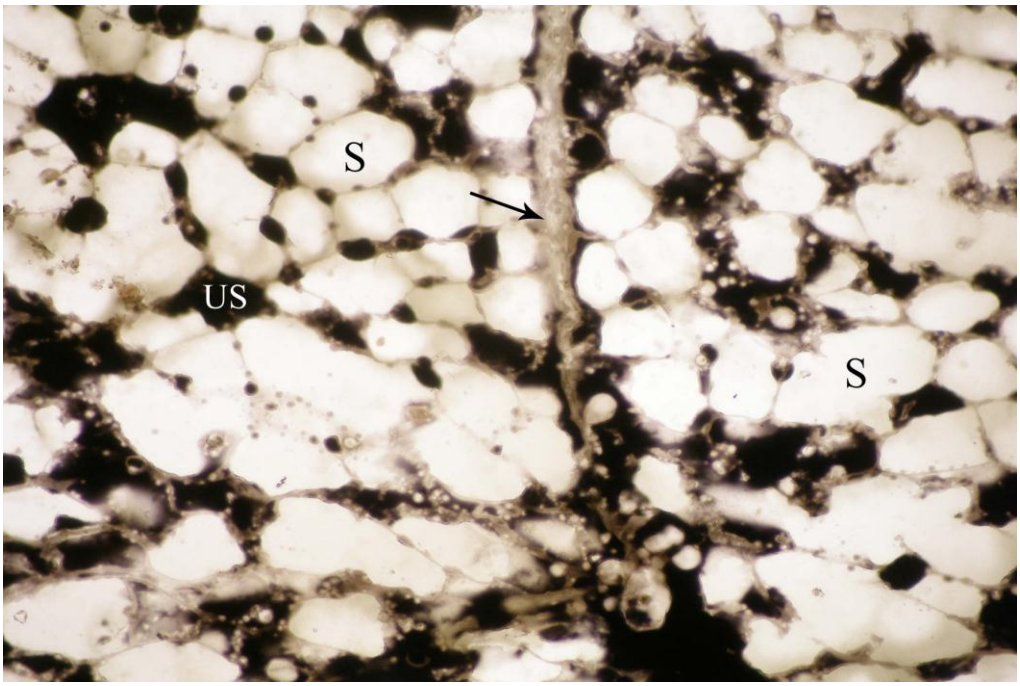


Fig (11): A photomicrograph of a section in perinephric fat obtained from adult male albino rat of group IIIa (low dose green tea group) showing large white adipocytes which contain saturated fat (S) separated by C.T septum (arrow) and contain few small black adipocytes which contain unsaturated fat (US).
[Osmic acid stain proj. 10x, obj. 10x]

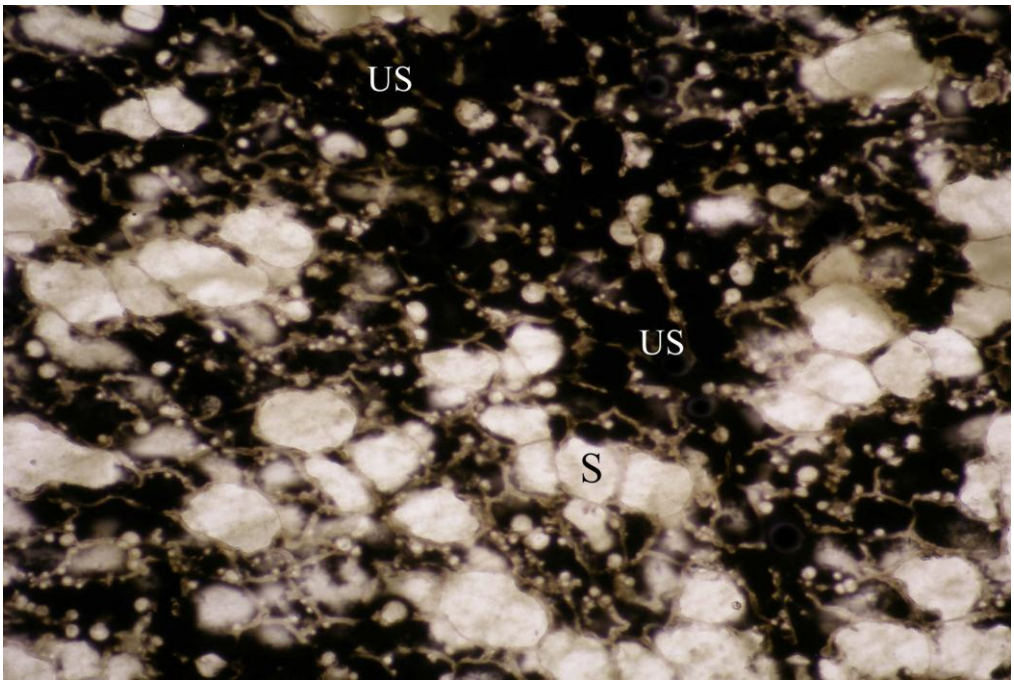


Fig (12): A photomicrograph of a section in perinephric fat obtained from adult male albino rat of group IIIb (high dose green tea group) showing many small black adipocytes which contain unsaturated fat (US) and few large white cells which contain saturated fat (S.)

[Osmic acid stain proj. 10x, obj. 10x]

[3] Electron microscope study:

(A) Transmission electron microscopy (TEM):

- **Group I (control group):** TEM showed unilocular adipocytes separated by extracellular spaces. Each cell was formed of large fat globule and thin rim of cytoplasm (Fig. 13). There was a few mitochondria within the thin rim of cytoplasm surrounding the unilocular adipocytes with eccentric flattened nucleus (Fig. 14).

- **Group II (positive control group):** TEM showed large number and size of mitochondria within thin rim of cytoplasm surrounding the unilocular adipocyte with eccentric flattened nucleus (Fig. 15). There was infiltration of extracellular space between large mature adipocytes by machrophages (Fig. 16).

- **Group IIIa (low dose green tea group):** TEM showed large number and size of mitochondria within the cytoplasm of adipocyte (Fig. 17).

- **Group IIIb (high dose green tea group):** TEM showed a few mitochondrial content within the cytoplasm of the adipocytes (Figs. 18).

(B) Scanning electron microscopy:

-**Group I (control group):** Perinephric adipose tissue was formed lobules of adipocytes of different sizes. They were separated by meshwork of connective tissue fibers (Fig. 19). The surface of the adipocytes was smooth (Fig. 20).

- **<u>Group II</u> (positive control group):** Adipocytes of this group were apparently larger and more globular as compared to those of the control group (Fig. 21). Adipocytes showed deep grooves over their surface caveolae (Fig. 22).

- **<u>Group III a</u> (low dose green tea group):** Adiopocyte of animal of this group appeared larger & globular nearly similar to group II (Fig. 23).

- **<u>Group III b</u> (high dose green tea group):** adipocytes of different sizes were observed nearly identical to the control group separated by connective tissue fibers (Fig. 24).

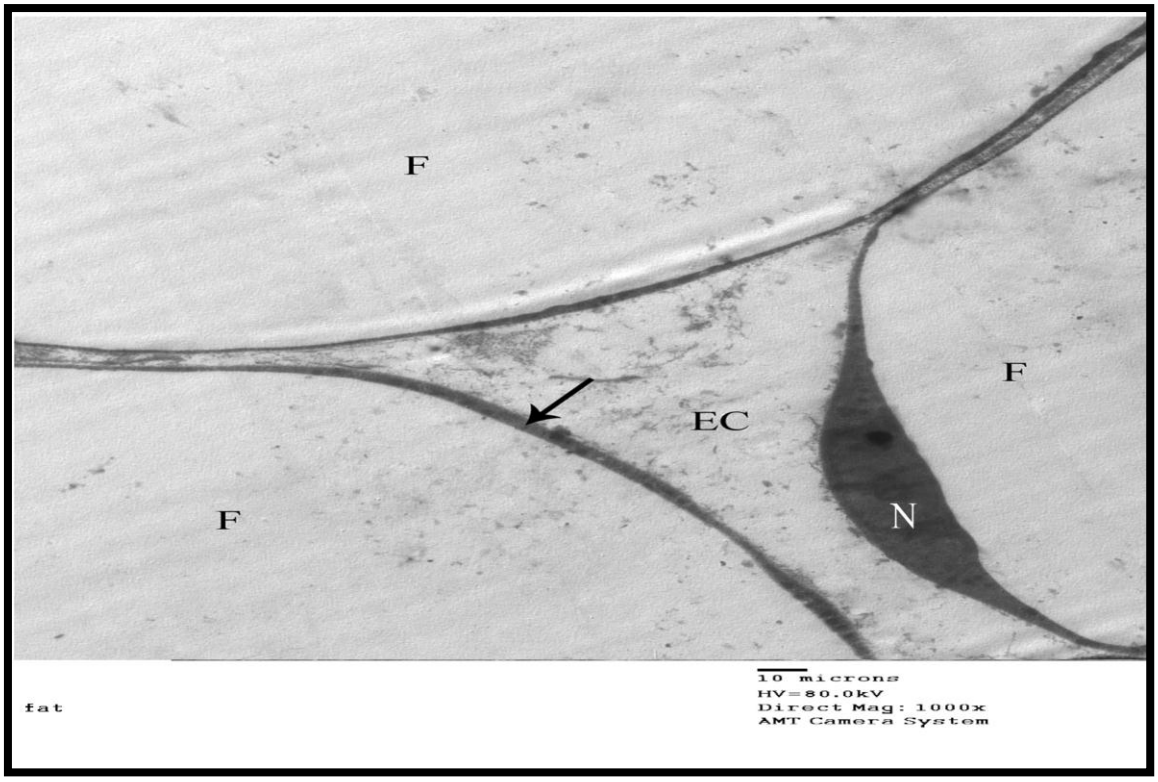


Fig. (13) : Transmission electron micrograph of a section in perinephric fat obtained from male albino rat of group I (control group) showing portions of 3 adjacent adipocytes separated by extracellular space (EC). Each cell's formed of large fat globule (F) and thin rim of cytoplasm (black arrow) and containing flat peripheral nucleus (N).

[X 1000]

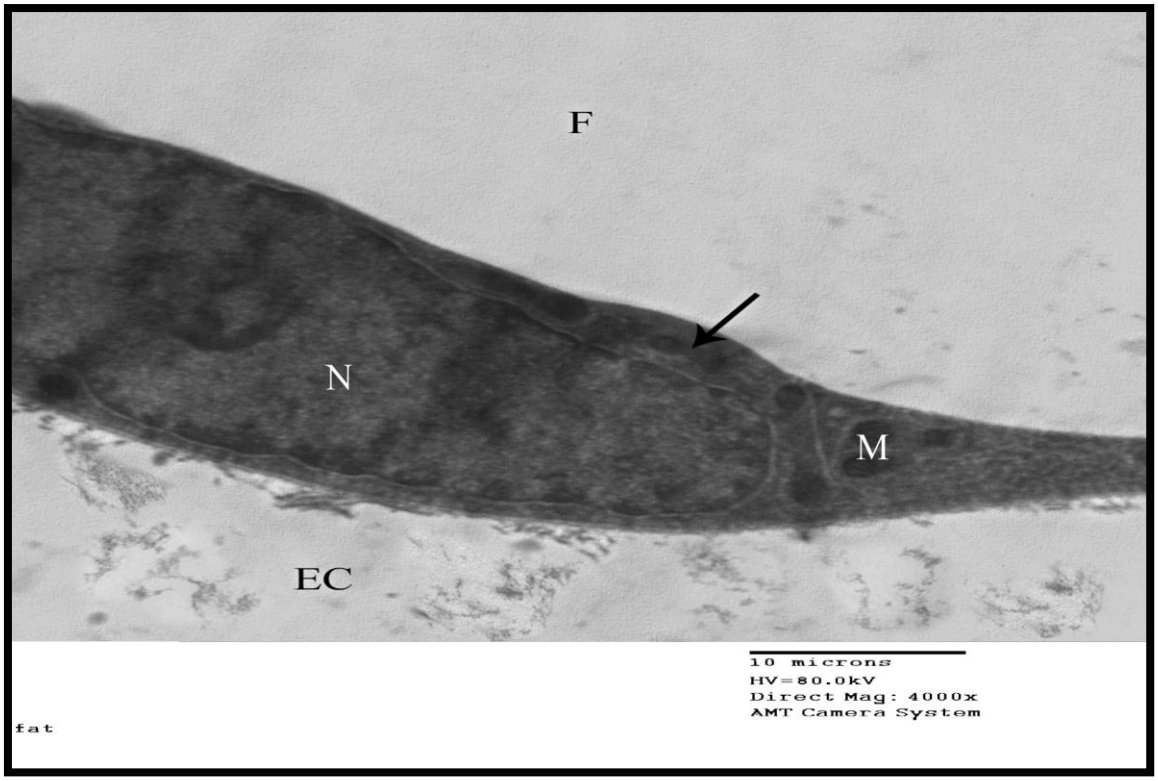


Fig. (14) : Transmission electron micrograph of a section in perinephric fat obtained from male albino rat of group I (control group) showing few mitochondria (M) within thin rim of cytoplasm (black arrow) surrounding fat globule (F) and containing flat prepheral nucleus (N)

[X 4000]

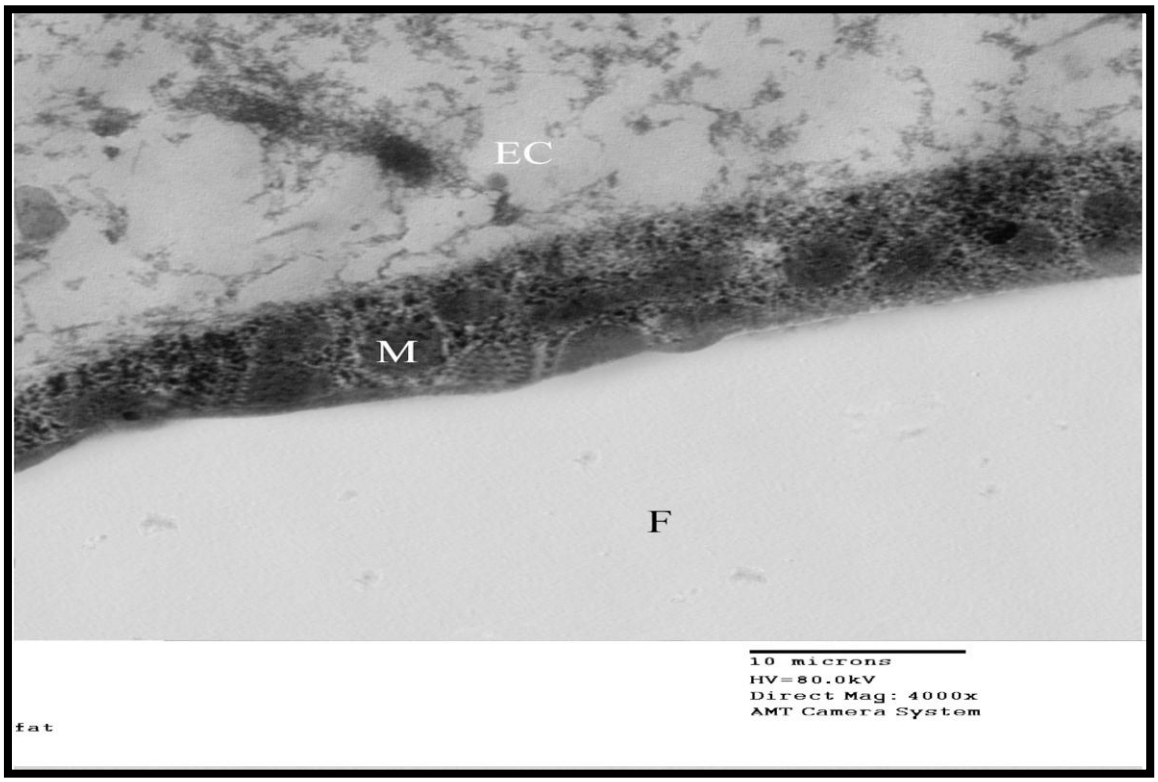


Fig. (15): Transmission electron micrograph of a section in perinephric fat obtained from male albino rat of group II (+ve control group) showing increase mitochondrial content (M) within thin rim of cytoplasm surrounding large fat globule (F). extracellular space (EC) from outside.

[X 4000]

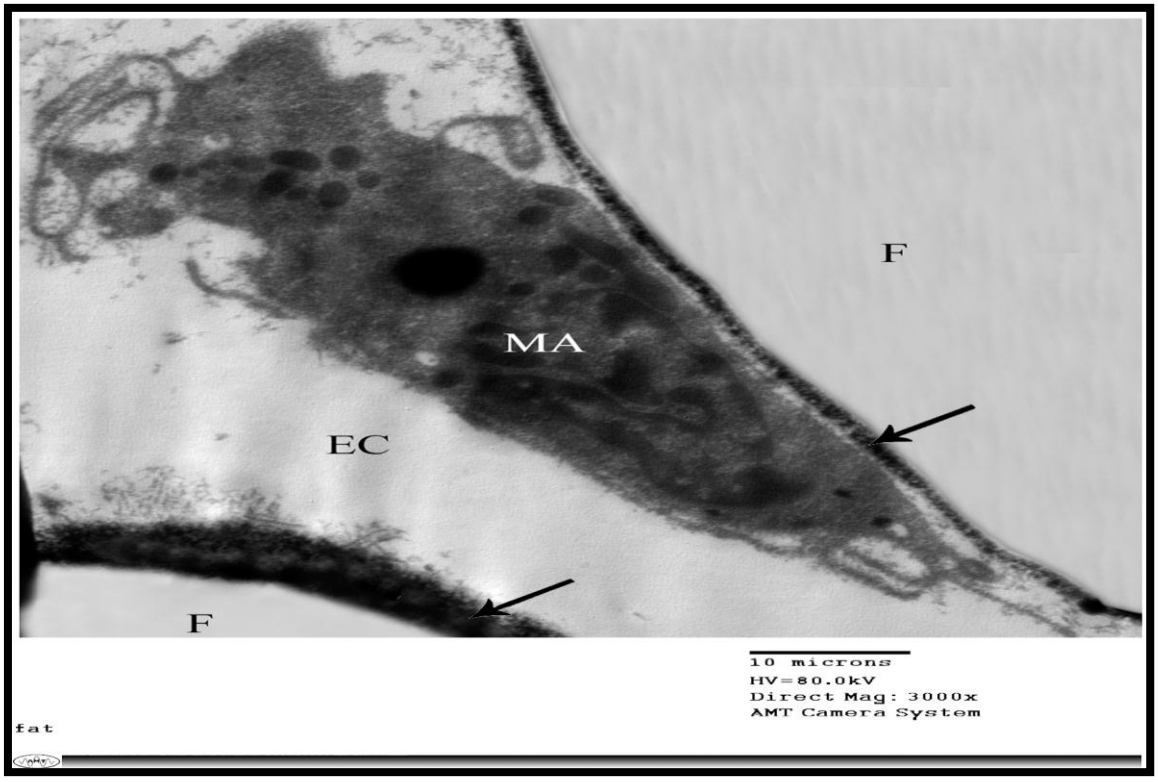


Fig. (16): Transmission electron micrograph of a section in perinephric fat obtained from male albino rat of group (II) (+ ve control group) showing infiltration of extracellular (EC) space between mature adipocyte by machrophage (MA). Each adipocyte is formed of large fat globule (F) and thin rim of cytoplasm (black arrow).

[X 3000]

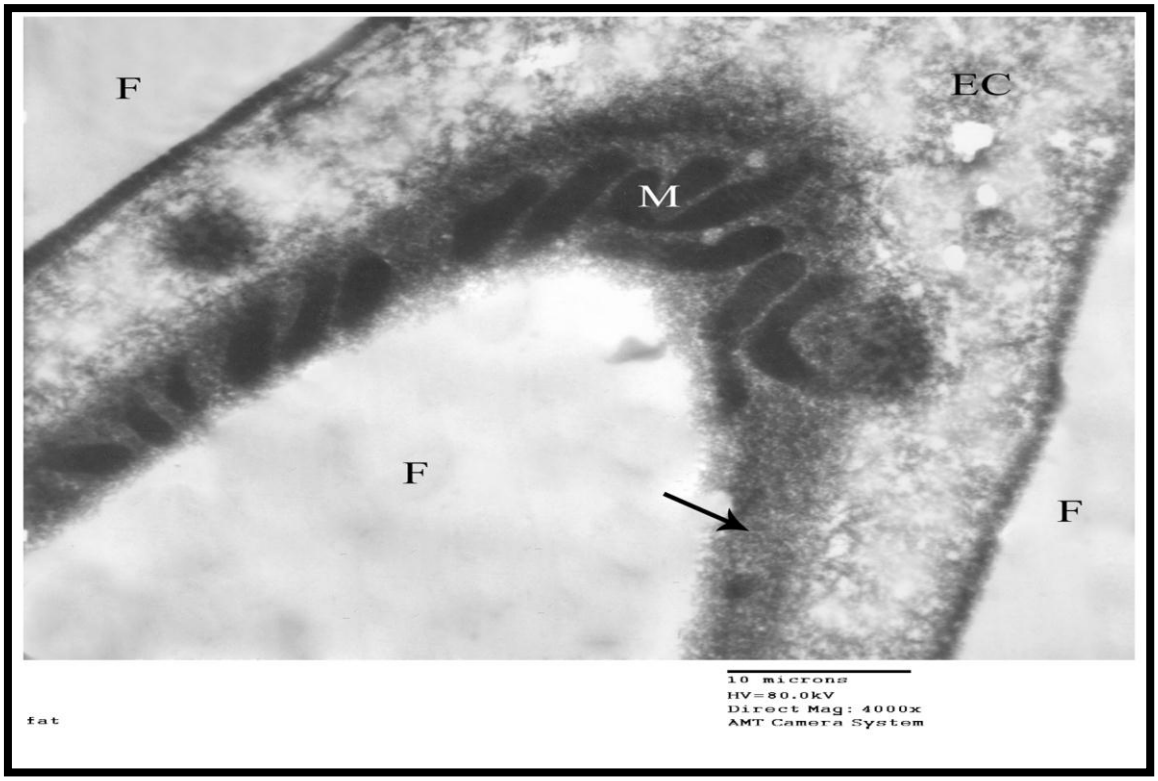


Fig. (17) : Transmission electron micrograph of a section in perinephric fat obtained from male albino rat of group IIIa (low dose green tea group) showing increase mitochondrial content (M) with thin rim to cytoplasm (black arrow) of adipocyte, fat globule (F) and extracellular space (EC).

[X 4000]

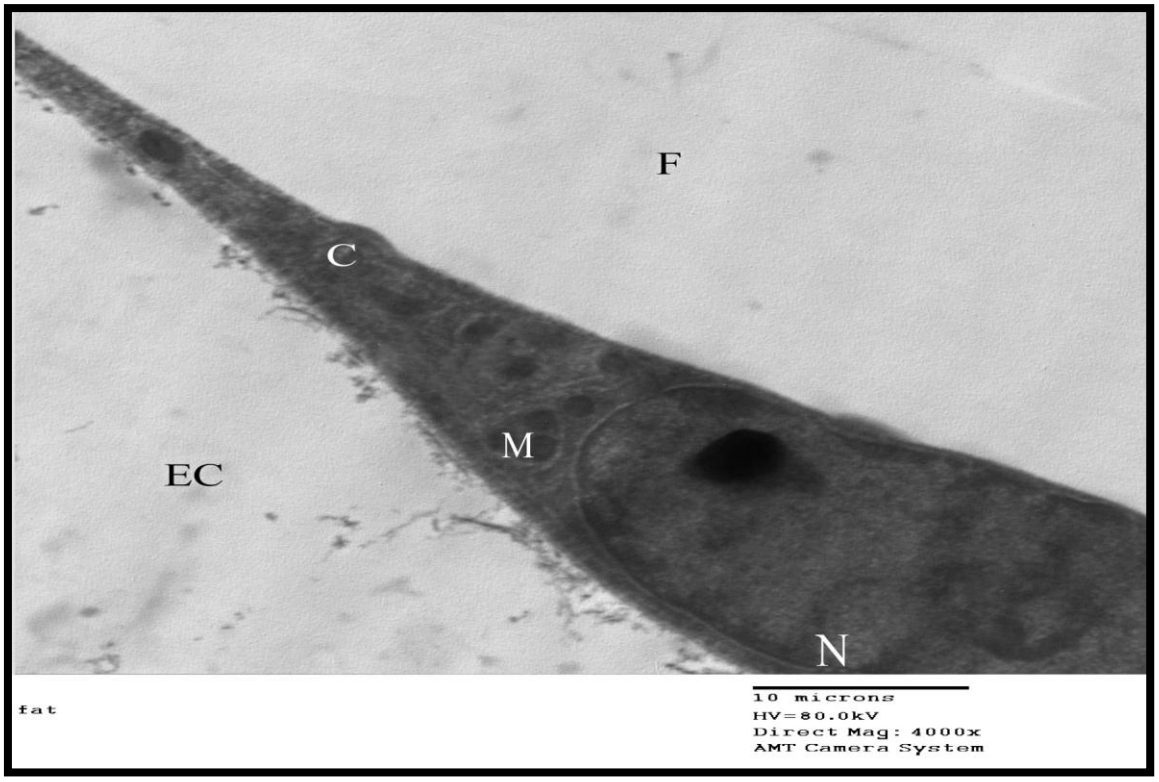


Fig. (18): Transmission electron micrograph of a section in perinephric fat obtained from male albino rat of group (IIIb) showing few mitochondrial content (M) and flat peripheral nucleus (N),within thin rim of the cytoplasm (C) of adipocyte, fat globule (F) and extraceelular space (EC)

[X 4000]

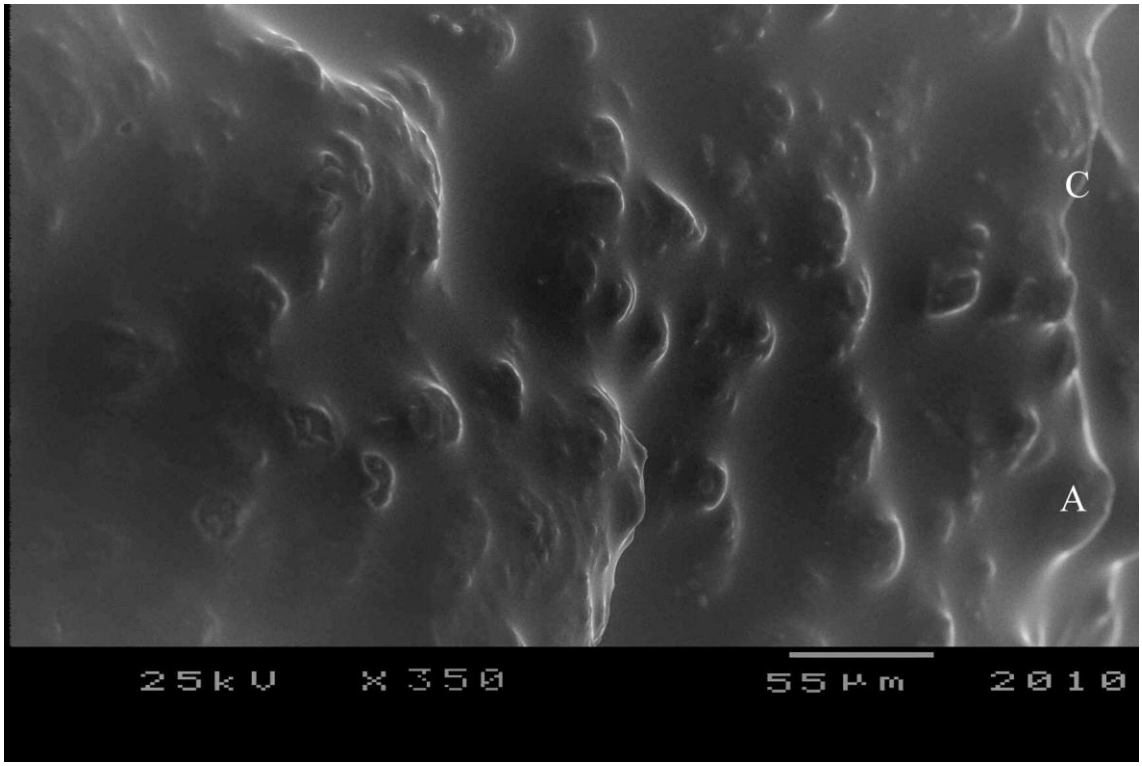


Fig.(19): Scanning electron micrograph of a section in perinephric fat obtained from male albino rat of group I (control group) showing small adipocytes (A) packed in meshwork of connective tissue fibers (c).

[X 350]

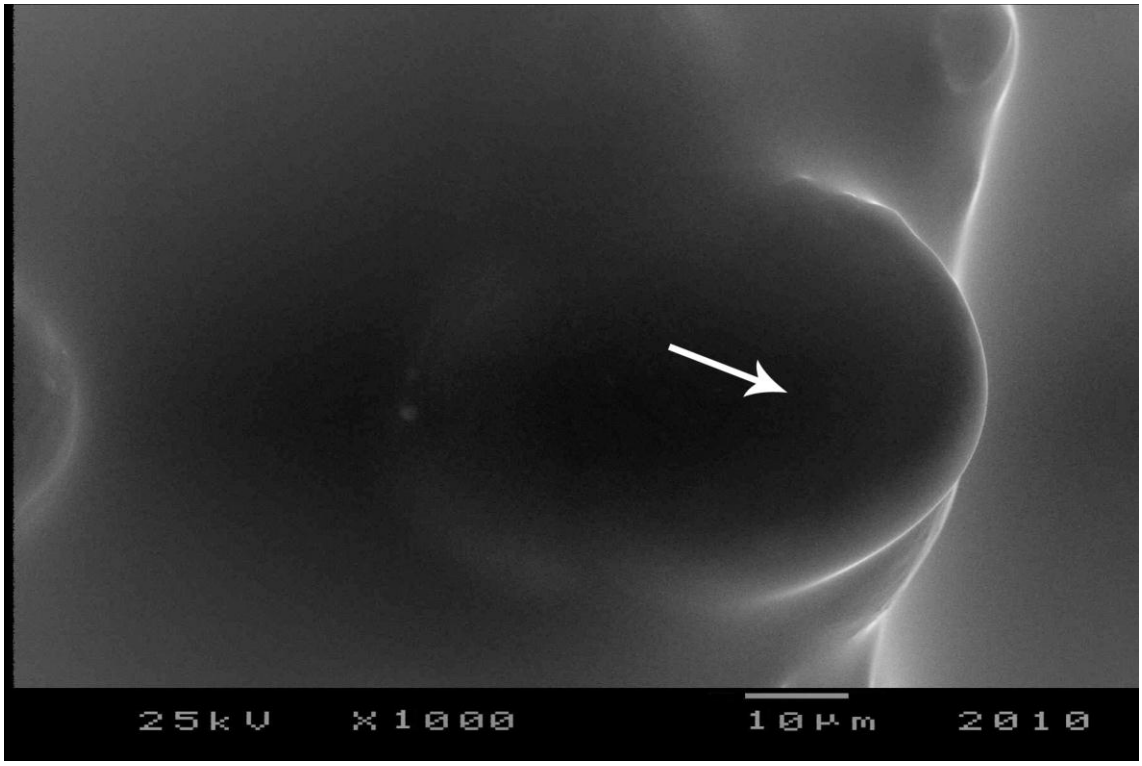


Fig. (20): A higher magnification of the previous field, showing a fat cell with smooth surface (arrow).

[X 1000]

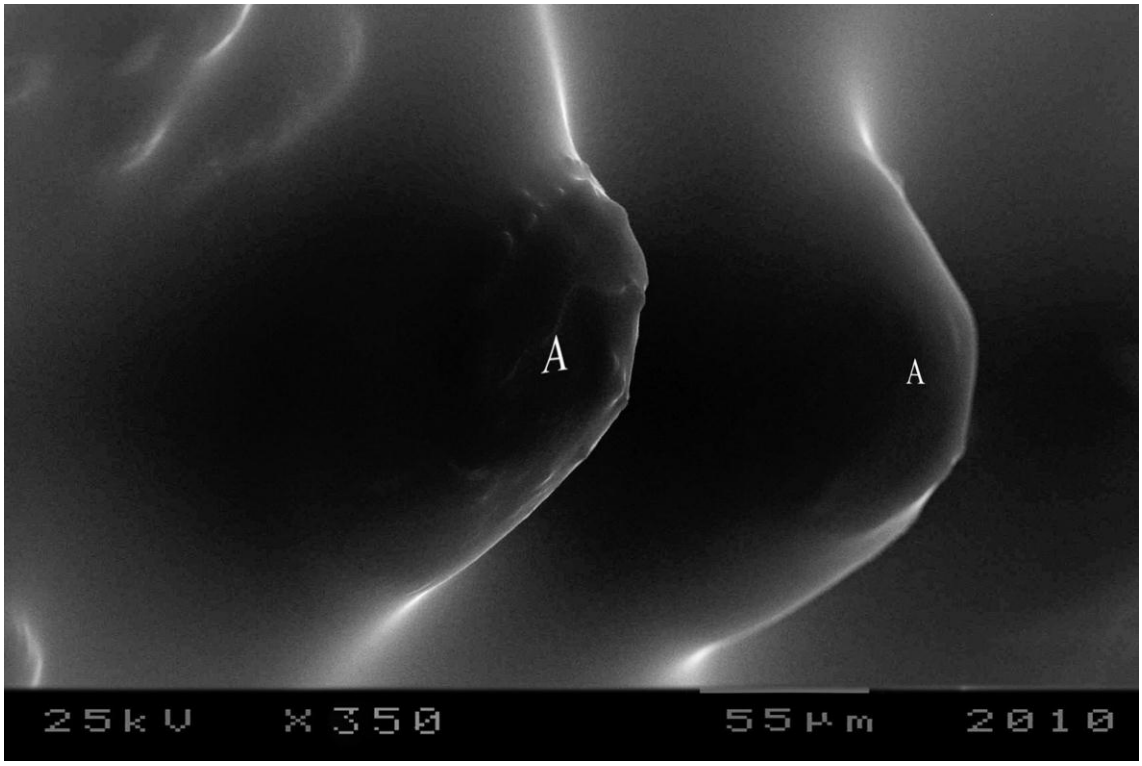


Fig.(21): Scanning electron micrograph of a section in perinephric fat obtained from male albino rat of group II (+ve control group) showing large and globular adipocytes.

[X350]

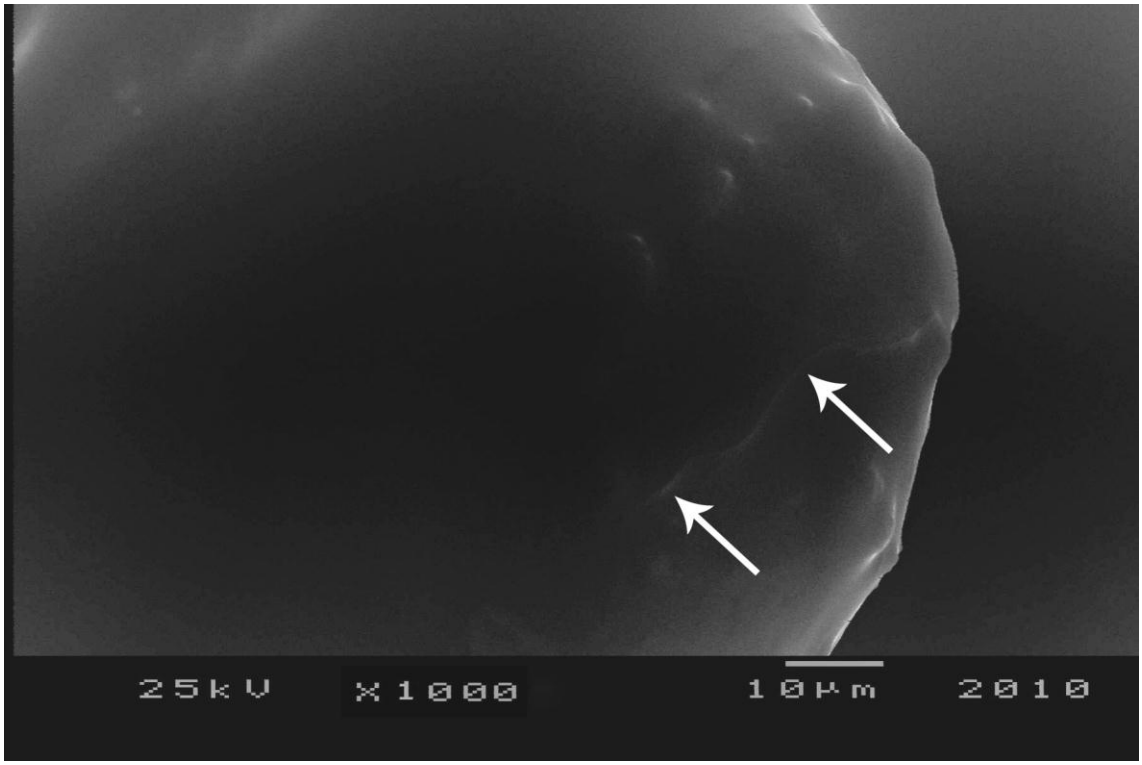


Fig. (22): A higher magnification of previous field showing adipocyte with deep grooves over the fat cell surface (arrow).

[X1000]

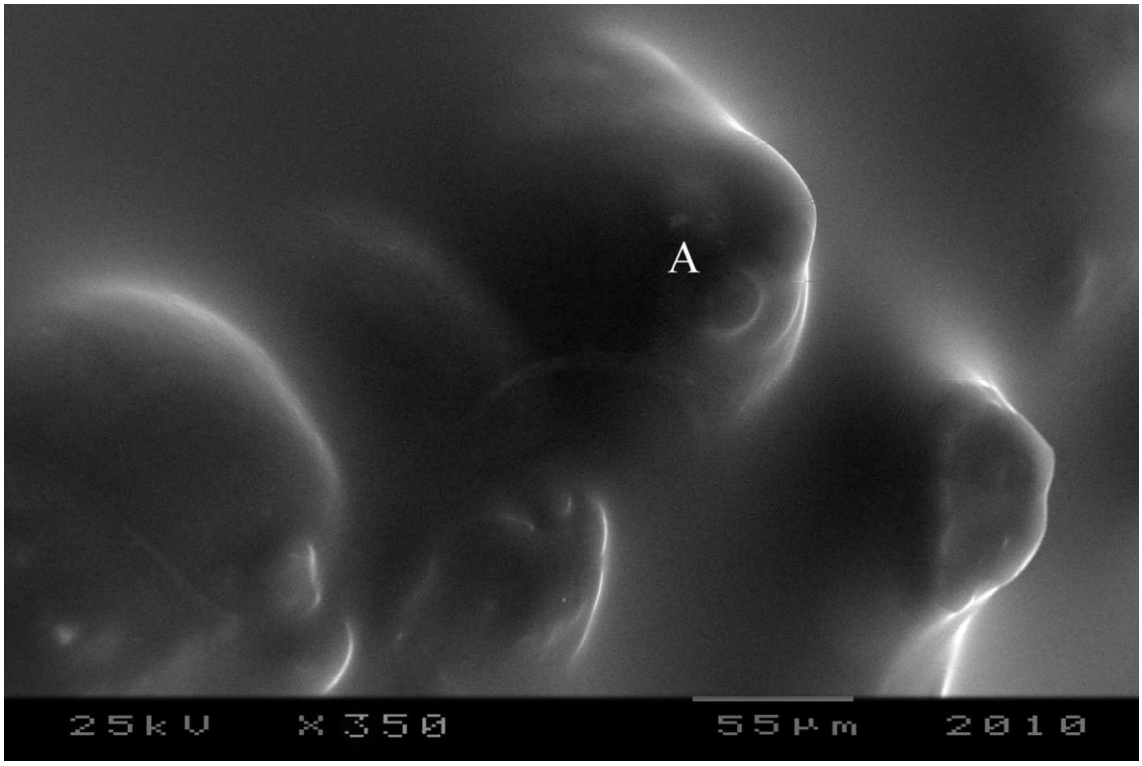


Fig. (23): Scanning electron micrograph of a section in perinephric fat obtained from male albino rat of group IIIa (low dose green tea group) showing large and globular adipocytes packed in meshowrk of connective tissue fibers (C).

[X 350]

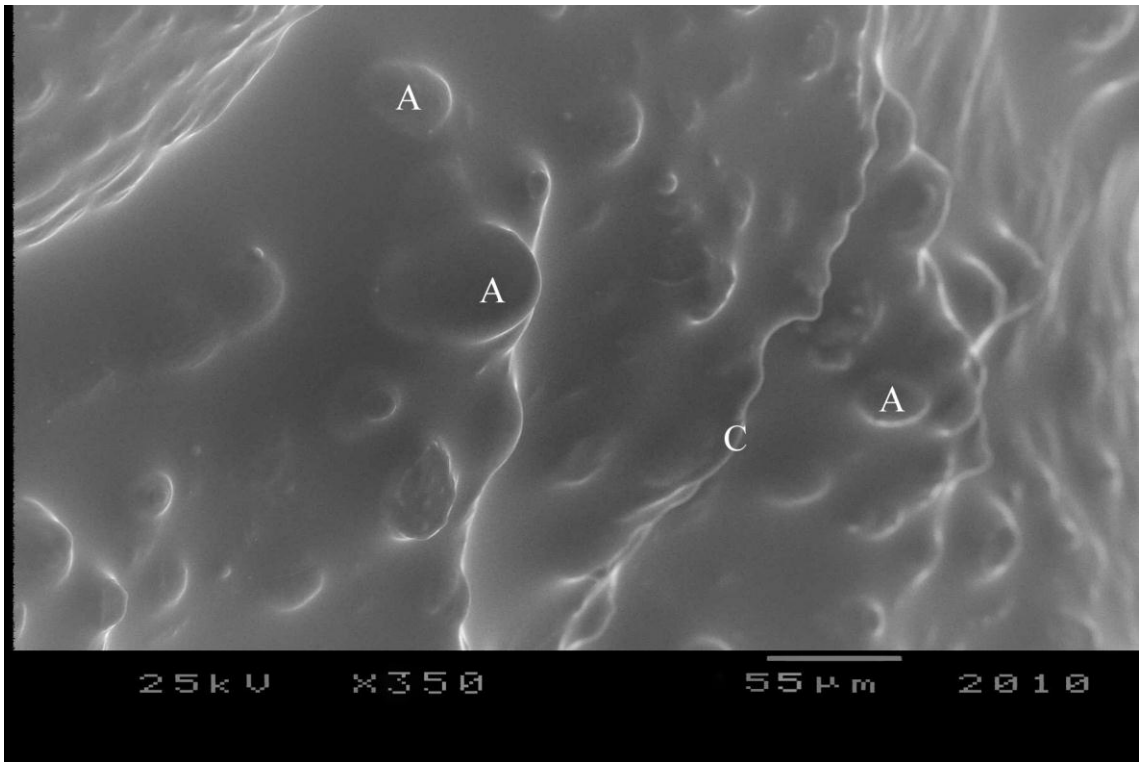


Fig. (24): Scanning electron micrograph of a section in perinephric fat obtained from male albino rat of group IIIb (high dose green tea group) showing adipocyles small in size separated by connective tissue fibres (arrow)

[X 350]