SEMI-THIN SECTIONS

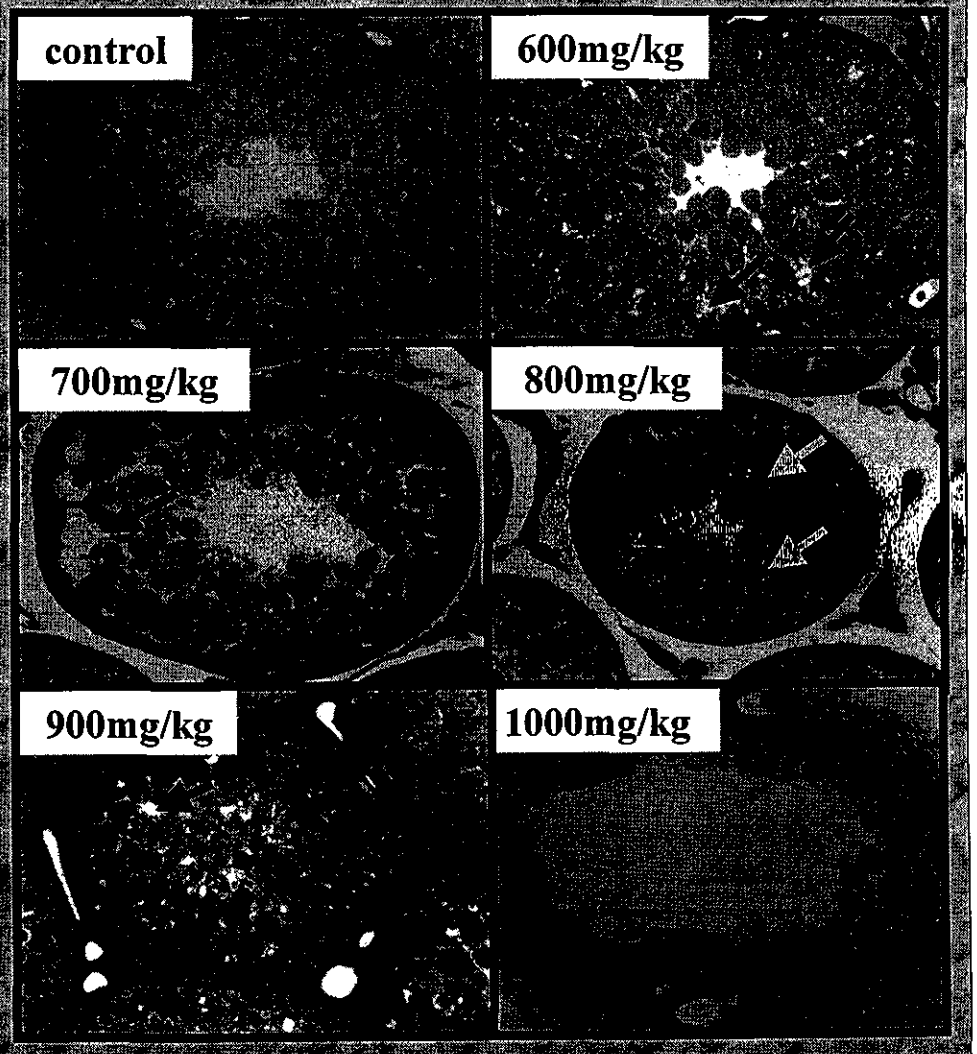


Fig. 3-1

Semi-thin sections of testes of rats fed with various doses of MEHP (Toluidine blue staining) (Mag. x 100).

➡ spaces between spermatogenic cells;

⇨ disruption of Sertoli cells;

➡ degenerating spermatogenic cells.

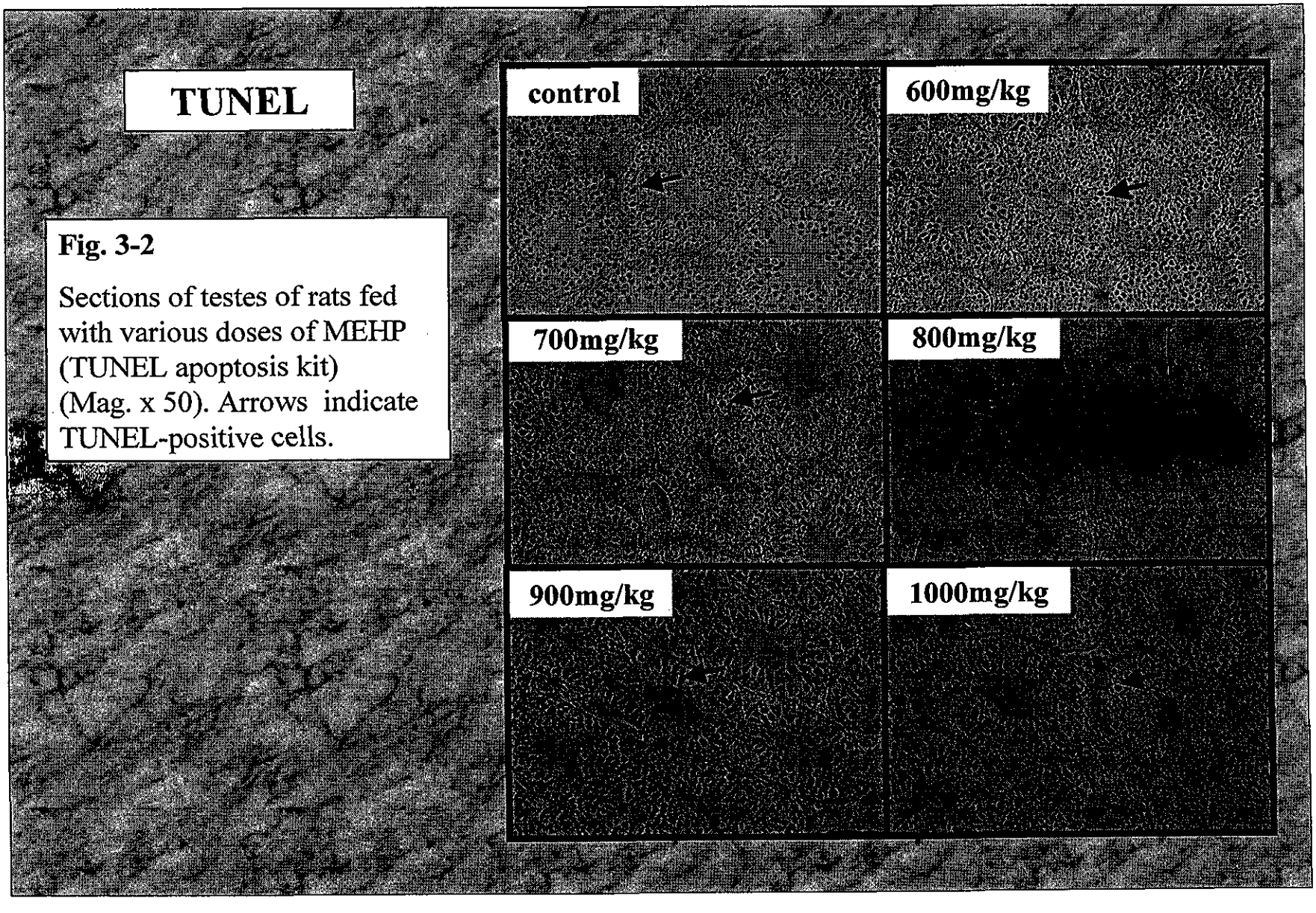
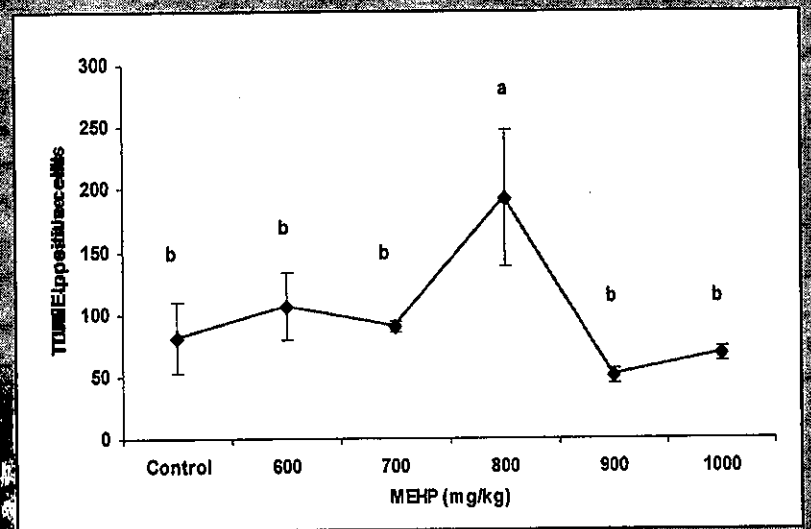
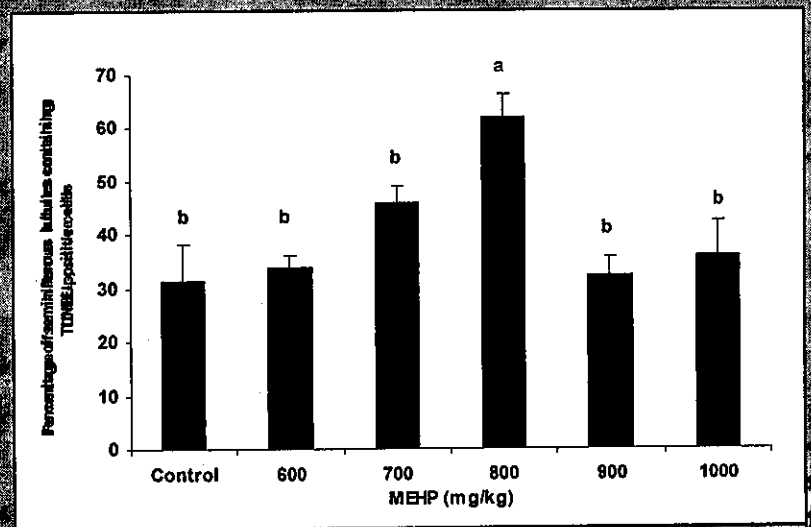


Fig. 3-2

Sections of testes of rats fed with various doses of MEHP (TUNEL apoptosis kit) (Mag. x 50). Arrows indicate TUNEL-positive cells.



a) Total apoptotic cells in 100 round seminiferous tubules.



b) Percentage of seminiferous tubules with TUNEL-positive cell

Fig. 3-3 Total apoptotic cells in 100 round seminiferous tubules and percentage of seminiferous tubules with TUNEL-positive cells in rats treated with various doses of MEHP. Data are presented as mean±SEM and alphabets show Duncan grouping. Rats fed with 800mg/kg MEHP (a) are significantly different ($p<0.05$) from those in rats fed with other doses (b).

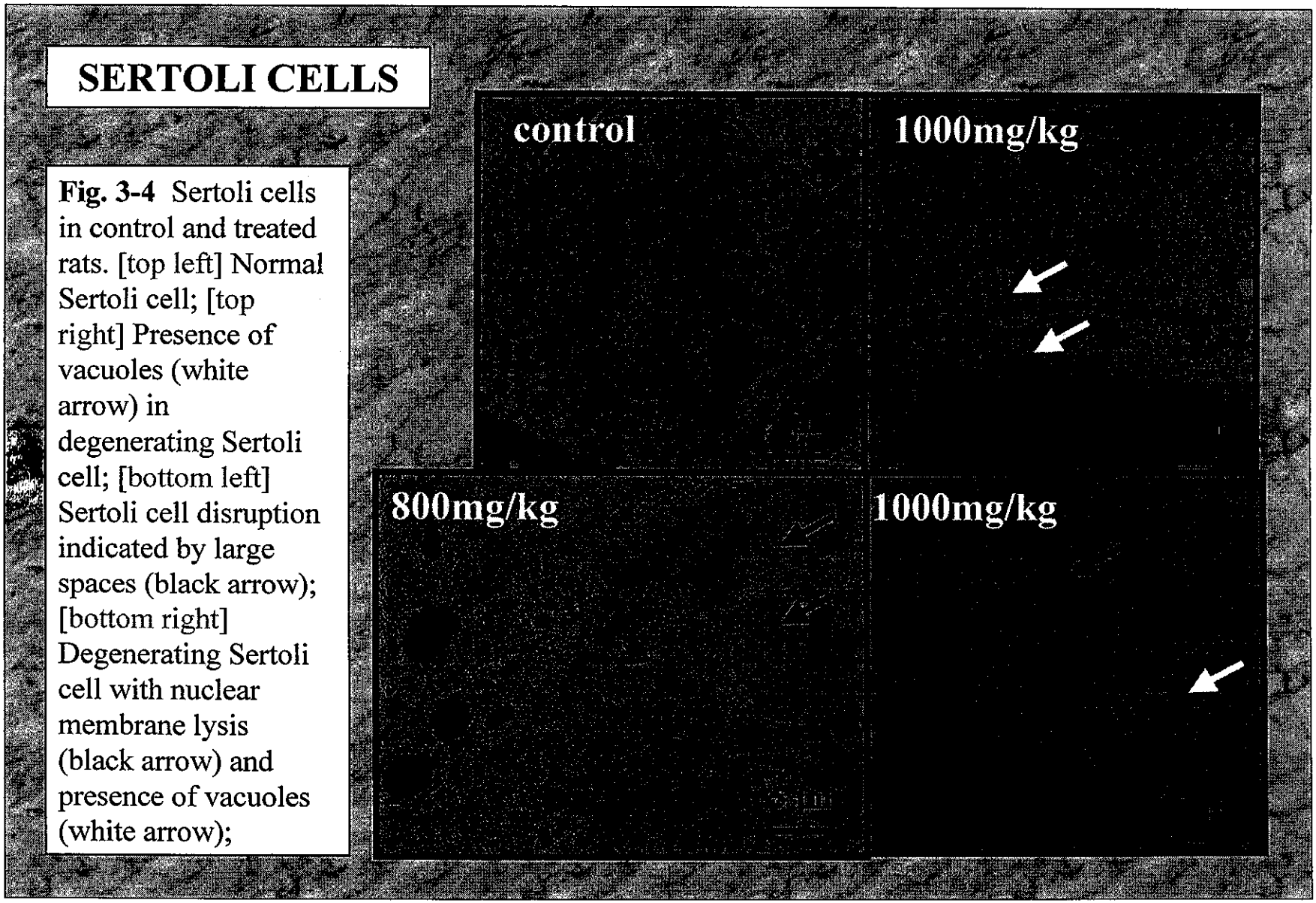


Fig. 3-4 Sertoli cells in control and treated rats. [top left] Normal Sertoli cell; [top right] Presence of vacuoles (white arrow) in degenerating Sertoli cell; [bottom left] Sertoli cell disruption indicated by large spaces (black arrow); [bottom right] Degenerating Sertoli cell with nuclear membrane lysis (black arrow) and presence of vacuoles (white arrow);

Fig.3-5 TUNEL

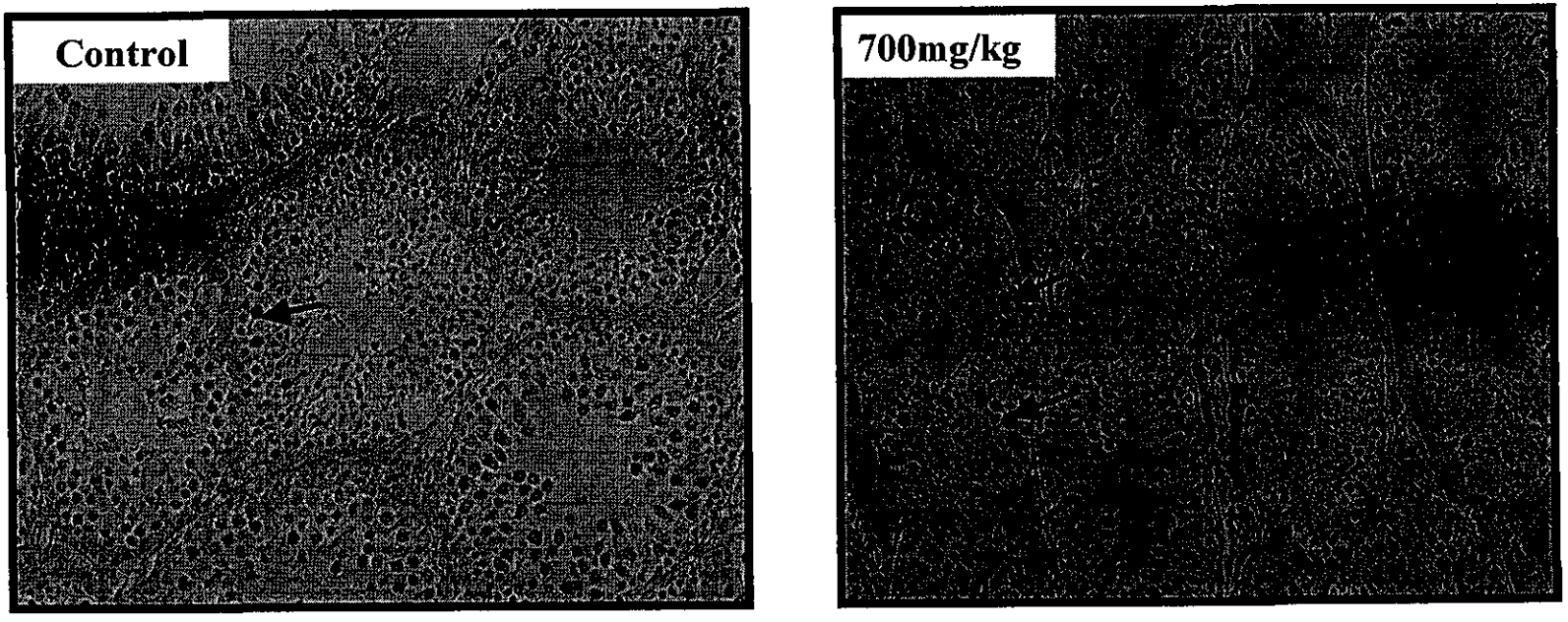
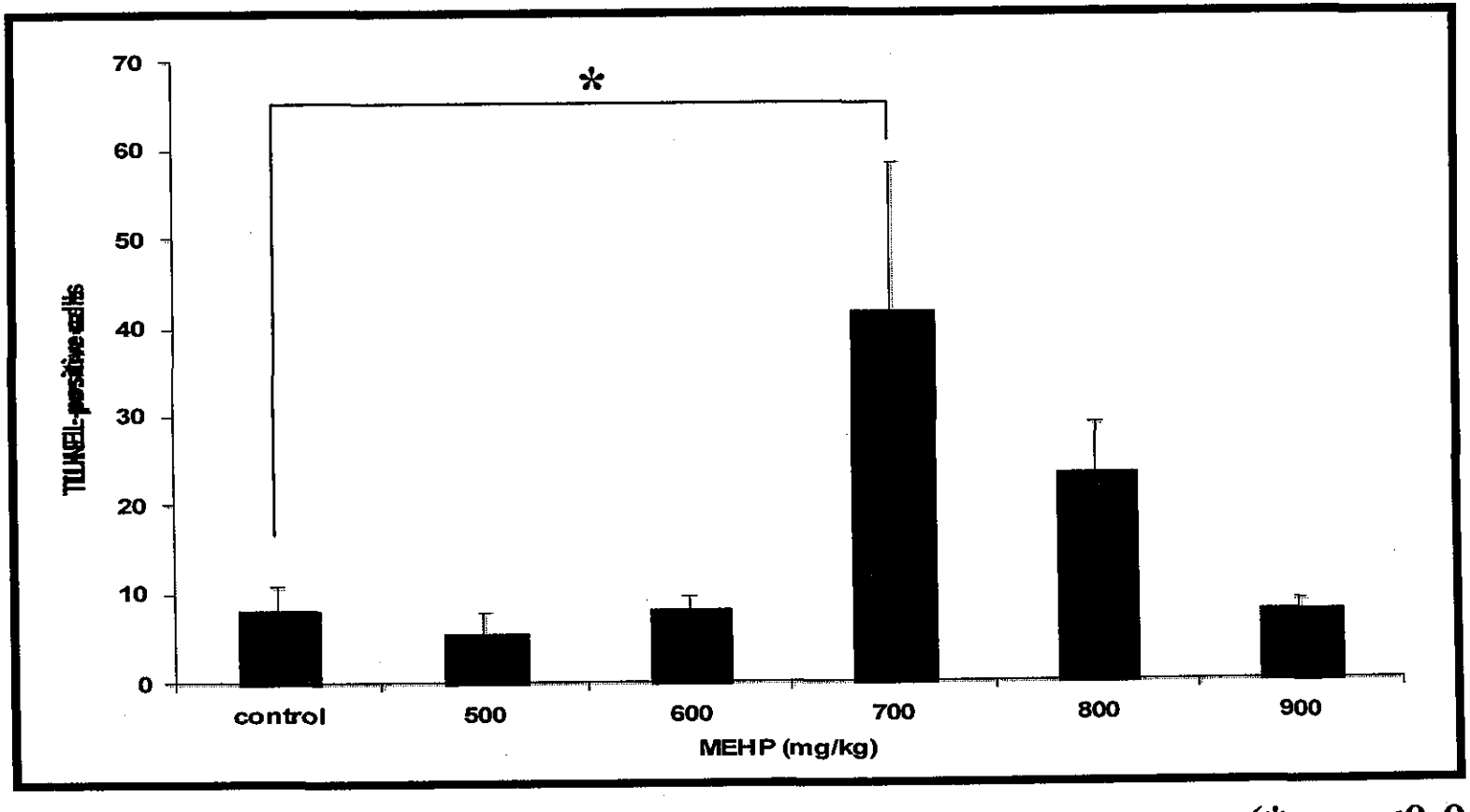


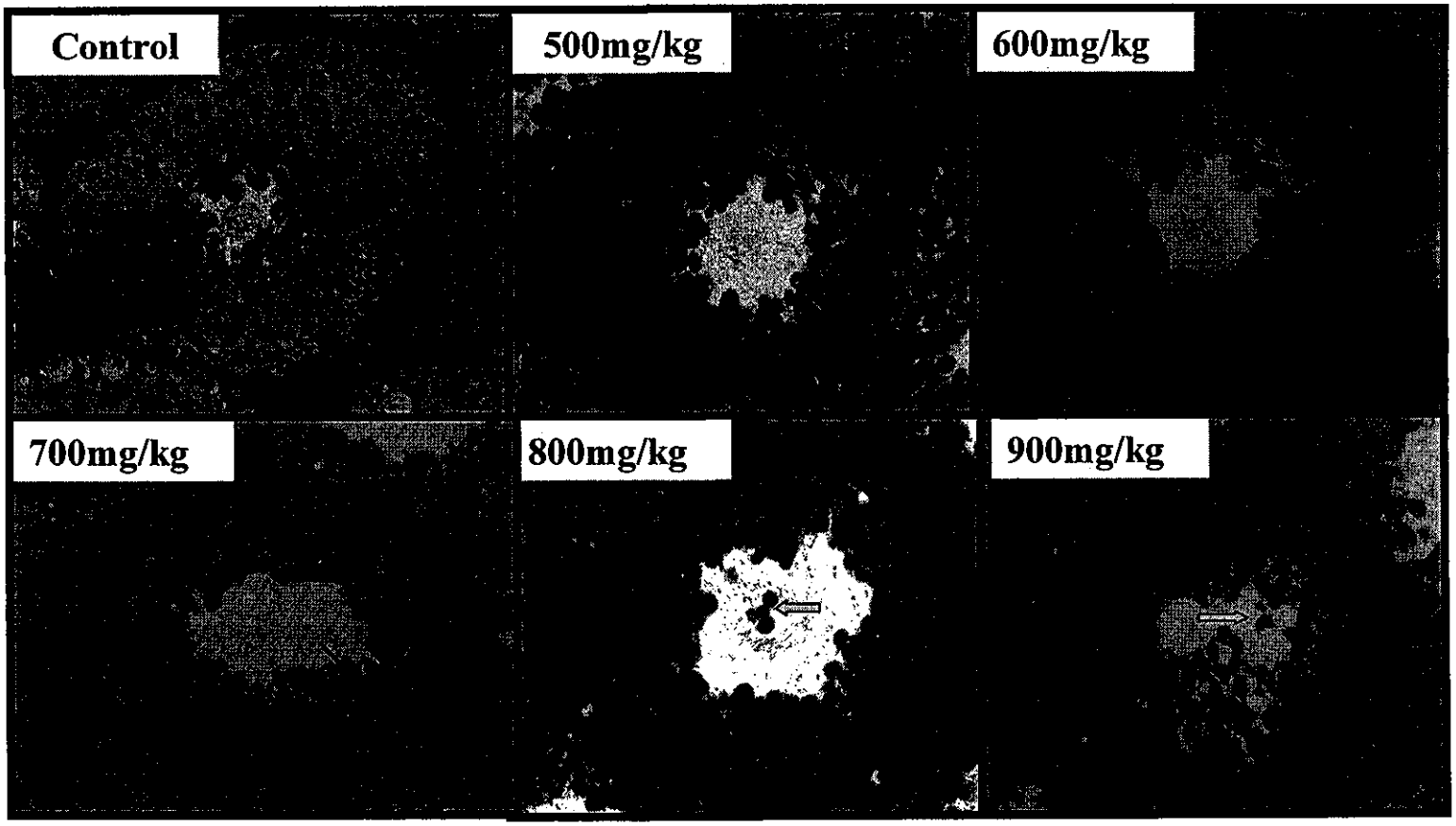
Fig. 3-6 TUNEL-positive cells



TUNEL-positive cells per 100 seminiferous tubules. **(* = p<0.05)**

Fig. 3-7 SEMITHIN SECTIONS

黒矢印：空胞　赤矢印：変性精細胞　黄矢印：脱落精細胞



(Mag. X100)

Fig. 3-8 TEM

a: normal spermatogenic cell (Mag.x4000)

b: degenerating spermatogenic cell showing marginated heterochromatin (Mag.x4000)

c: normal Sertoli cell (Mag.x3500)

d: degenerating Sertoli cell with vacuoles (black arrow) (Mag.x2500)

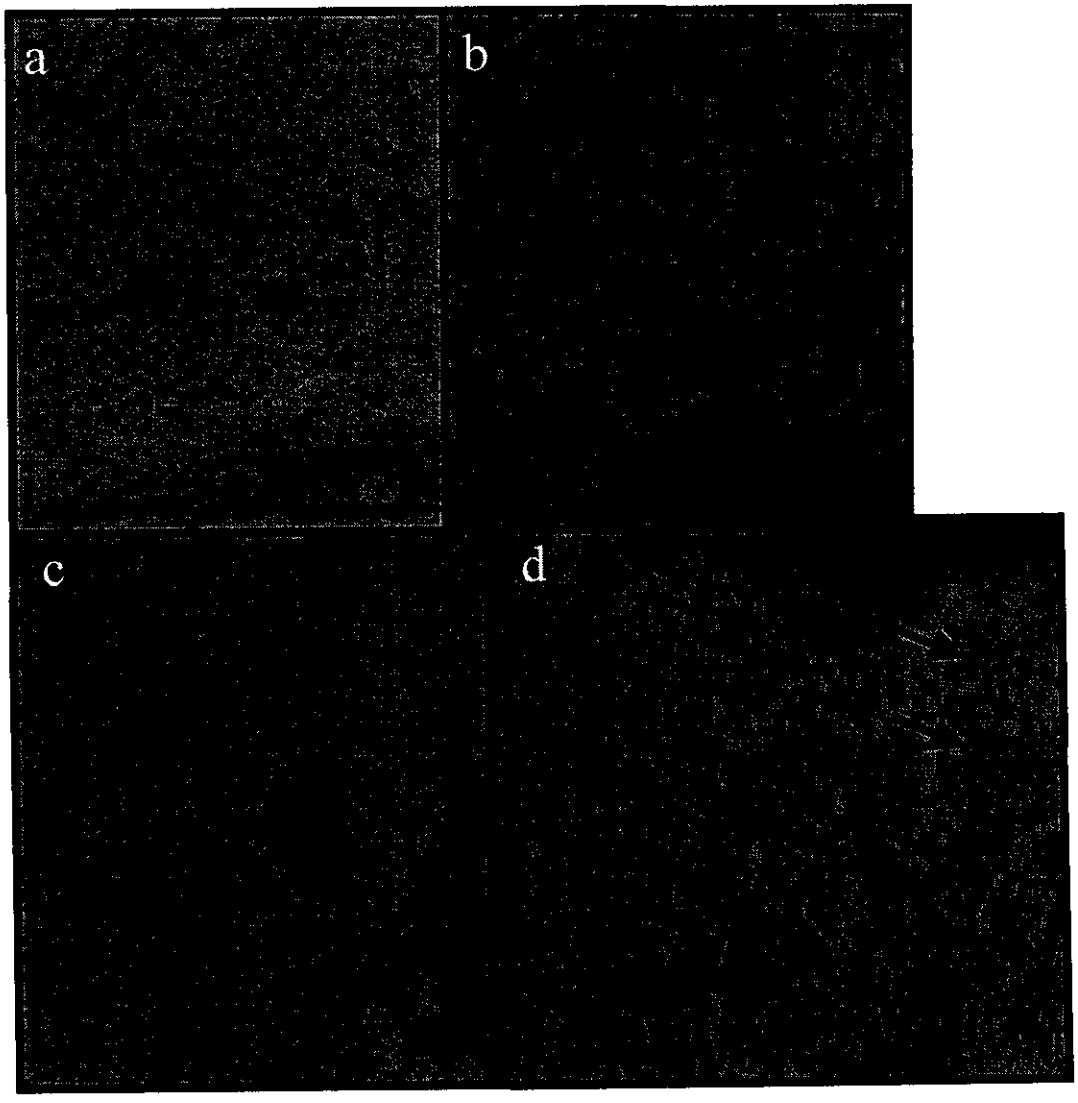
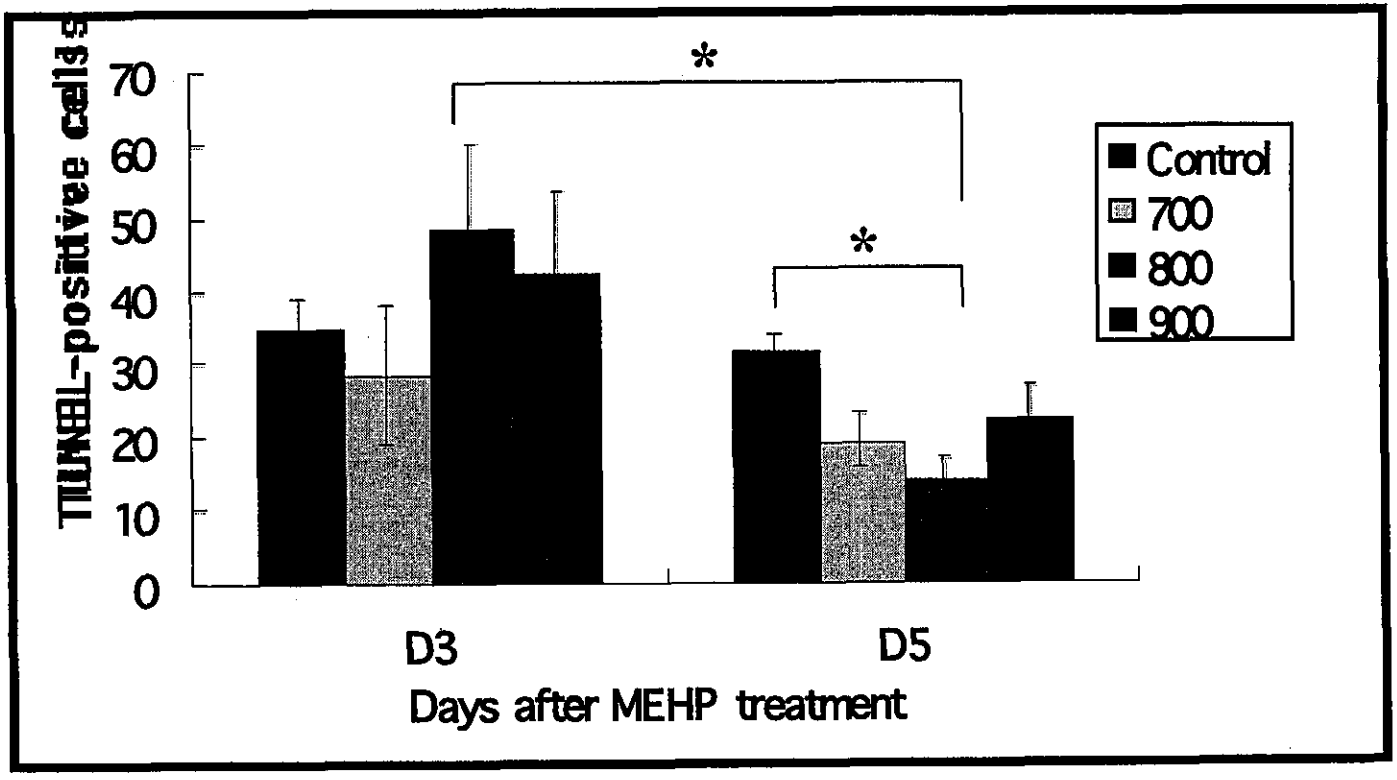


Fig.3-9 TUNEL



TUNEL-positive cells per 100 seminiferous tubules.

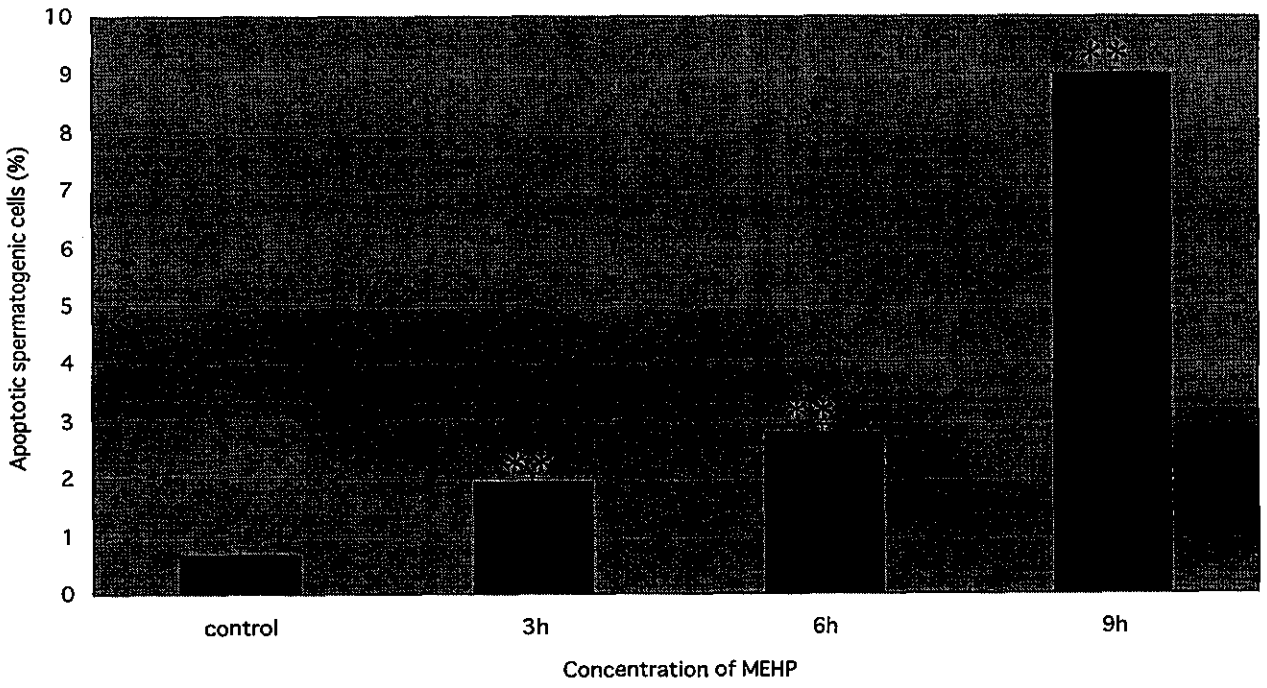


Fig. 3-11 Apoptotic spermatogenic cells increased in a time-dependent manner (**P<0.01)

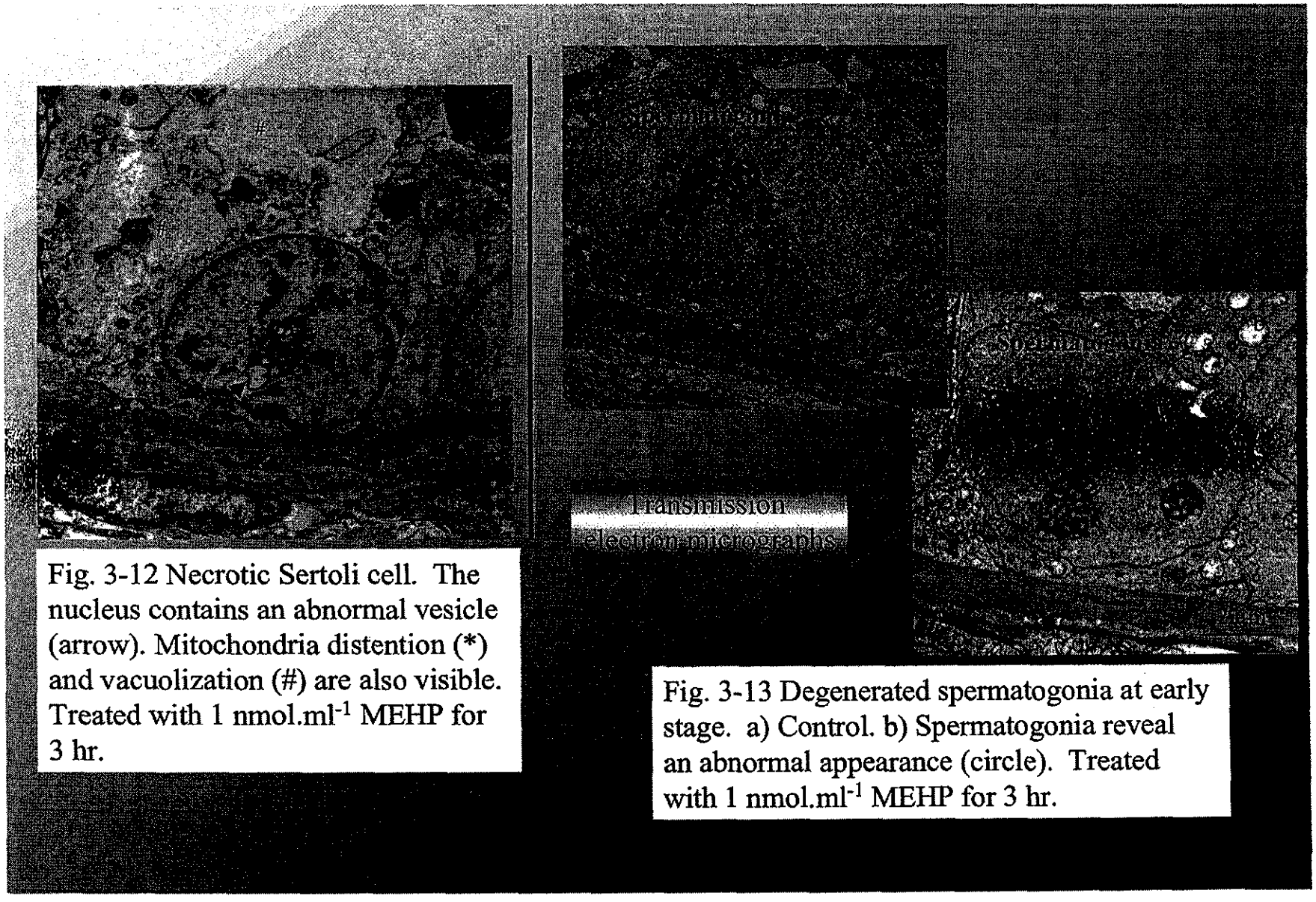


Fig. 3-12 Necrotic Sertoli cell. The nucleus contains an abnormal vesicle (arrow). Mitochondria distention (*) and vacuolization (#) are also visible. Treated with 1 nmol.ml^{-1} MEHP for 3 hr.

Fig. 3-13 Degenerated spermatogonia at early stage. a) Control. b) Spermatogonia reveal an abnormal appearance (circle). Treated with 1 nmol.ml^{-1} MEHP for 3 hr.

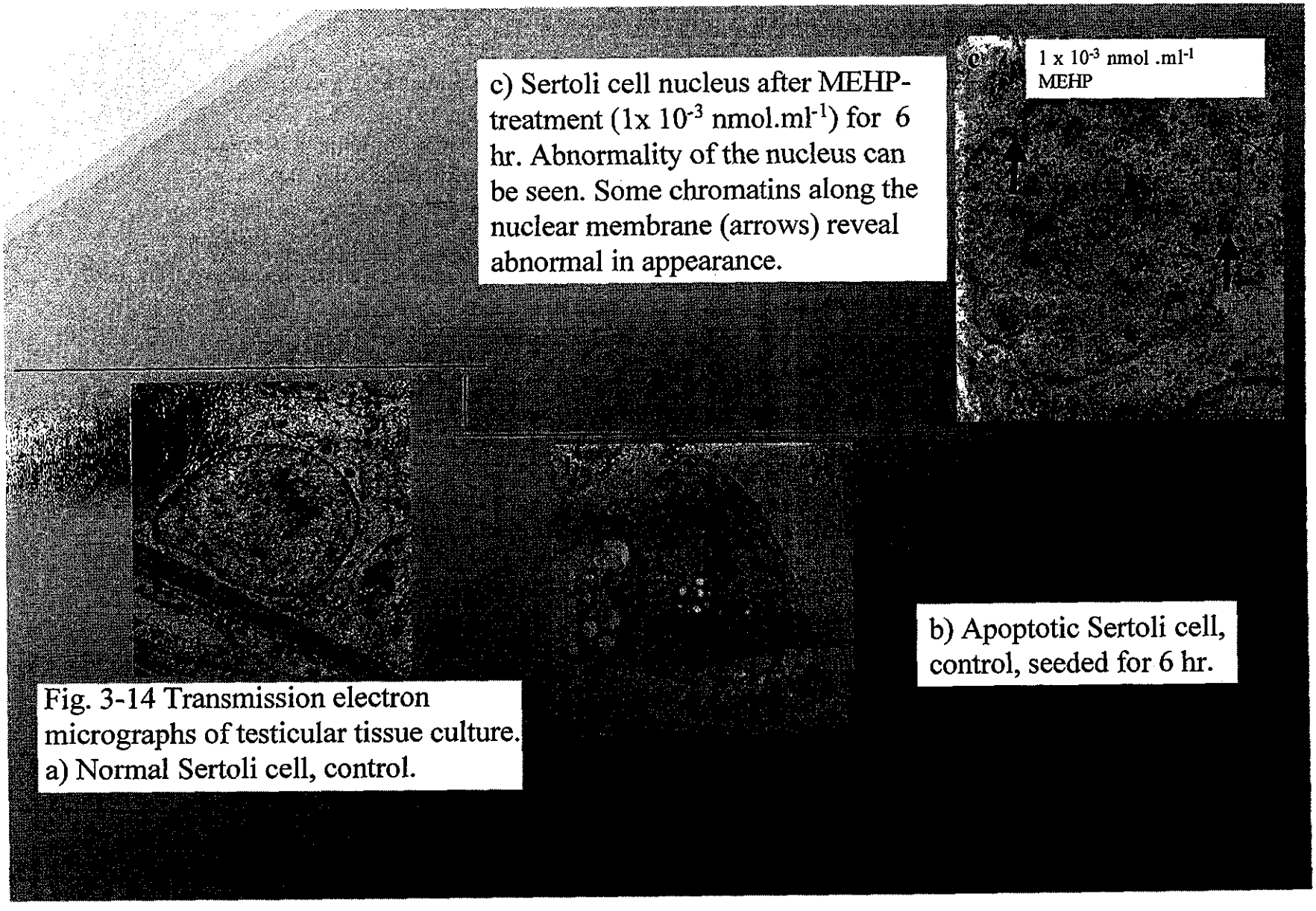


Fig. 3-14 Transmission electron micrographs of testicular tissue culture. a) Normal Sertoli cell, control.

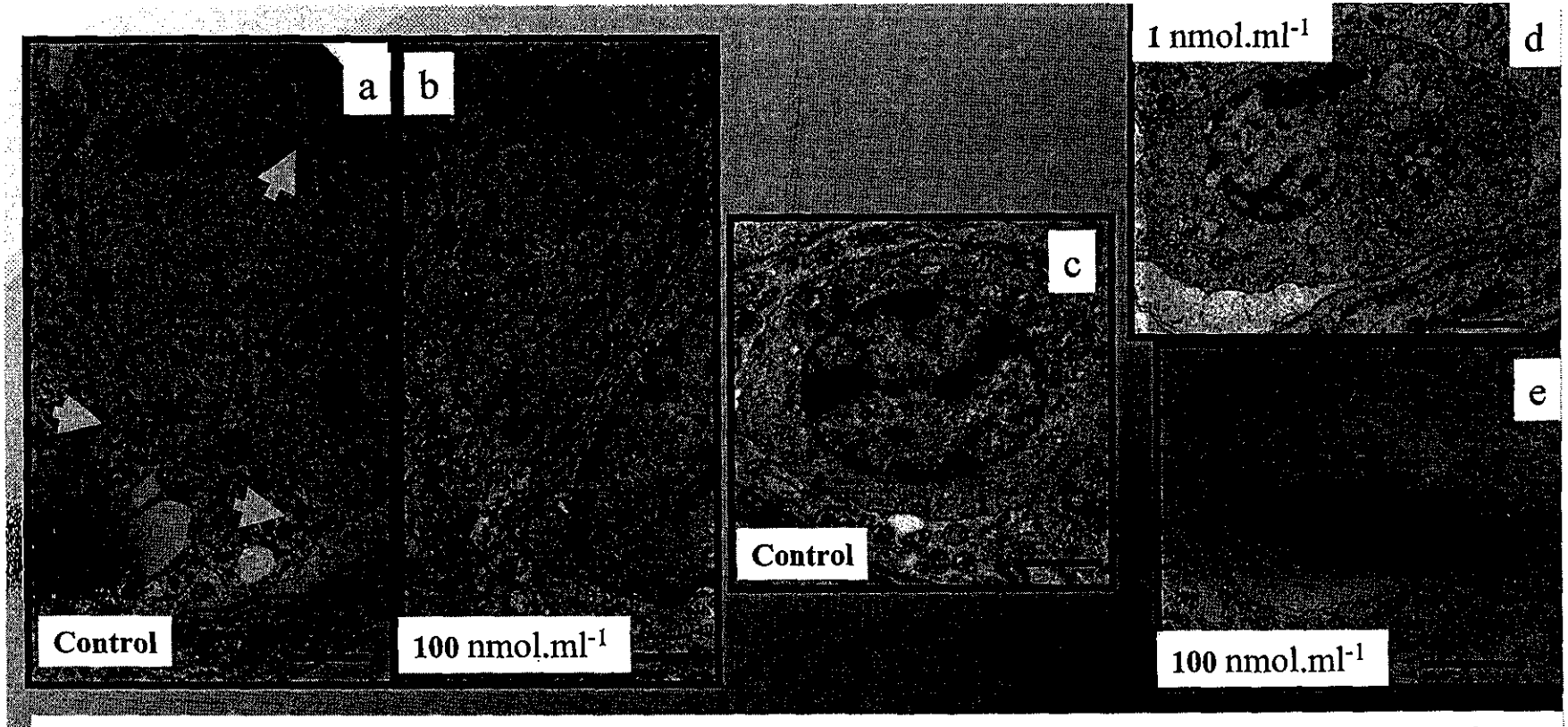


Fig. 3-15 Ultrastructural appearances of control and MEHP-treated testicular cells at 1 hr after seeding.

(a); In control Sertoli cell, vacuolization occurs, while mitochondria in normal shape are dominated (yellow arrow), (b); Sertoli nuclear membrane is partly lysed (round marker). It should be the first step of apoptosis, (c); Normal spermatogenic cell in control, (d); Swollen mitochondria (red arrow). It might be the early stage of necrotic spermatogenic cell after administration of 1 nmol/ml MEHP, (e); Apoptotic spermatogenic cell. ScN = Sertoli cell nucleus.

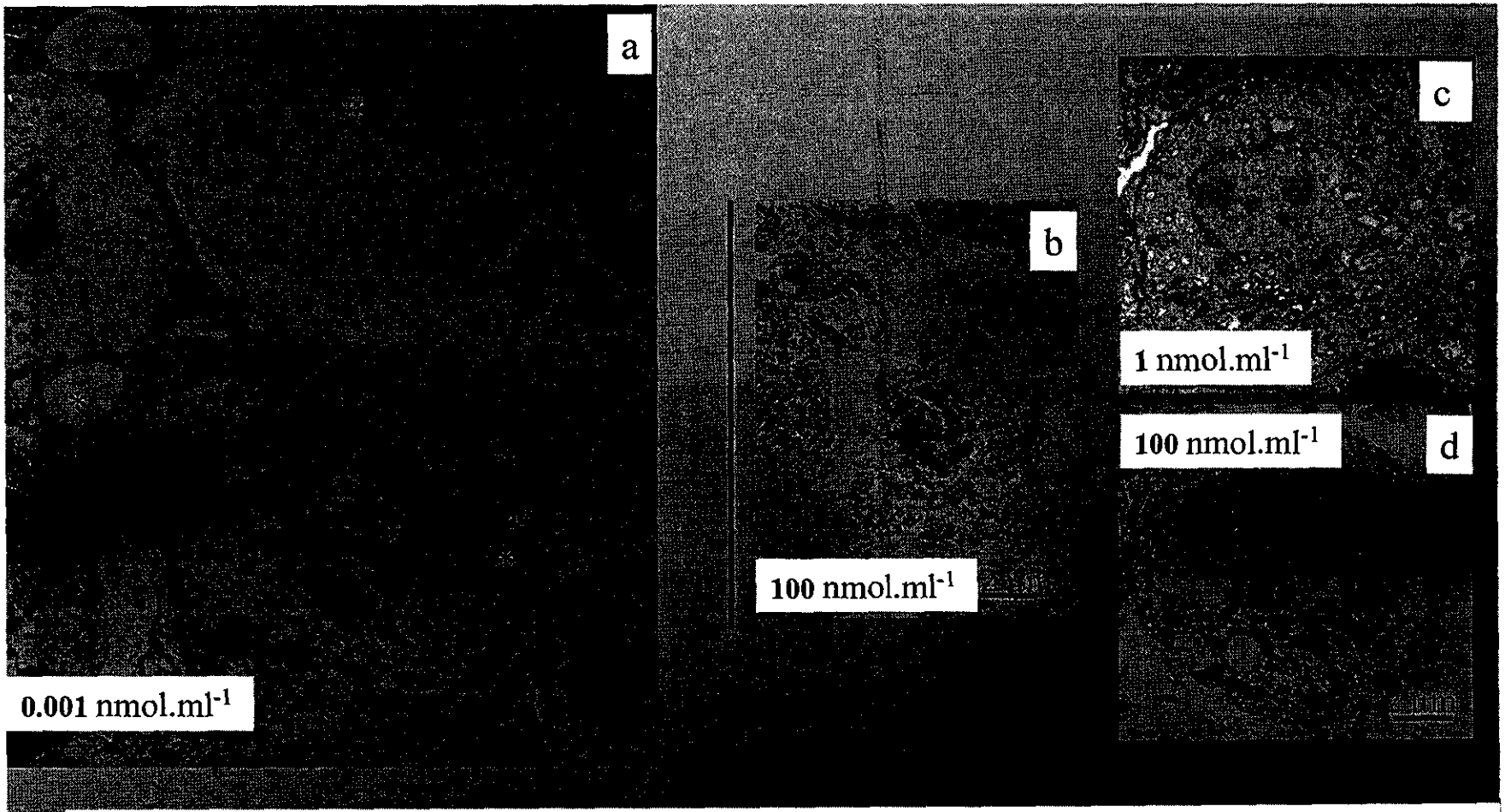


Fig. 3-16 Ultrastructural appearances of control and MEHP-treated testicular cells at 6 hr.

(a); Apoptotic Sertoli cell. Vacuolization (asterisk) and nuclear membrane lysis (red arrows) occur, while swollen cytoplasm (#) and condensed nuclei in spermatogenic cells are recognizable, (b); In necrotic spermatogenic cell, no organelles are functioning, (c); Apoptotic cell depicts nuclear membrane lysis, (d); By MEHP-treatment, apoptotic spermatogenic cell is frequently found. Organelles are still functioning.

Apoptotic spermatogonia/cells
3 hr
6 hr
9 hr

Fig. 3-19

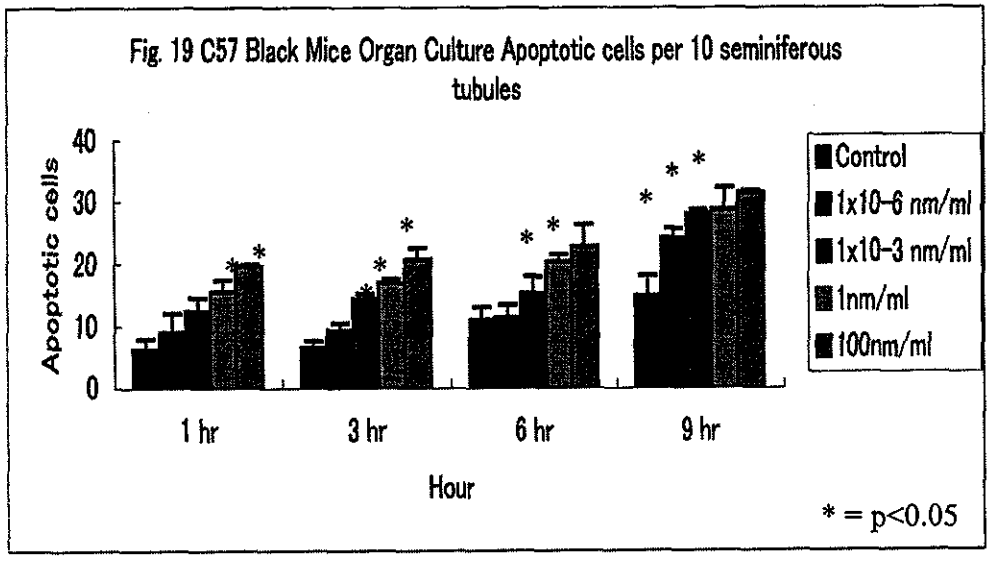
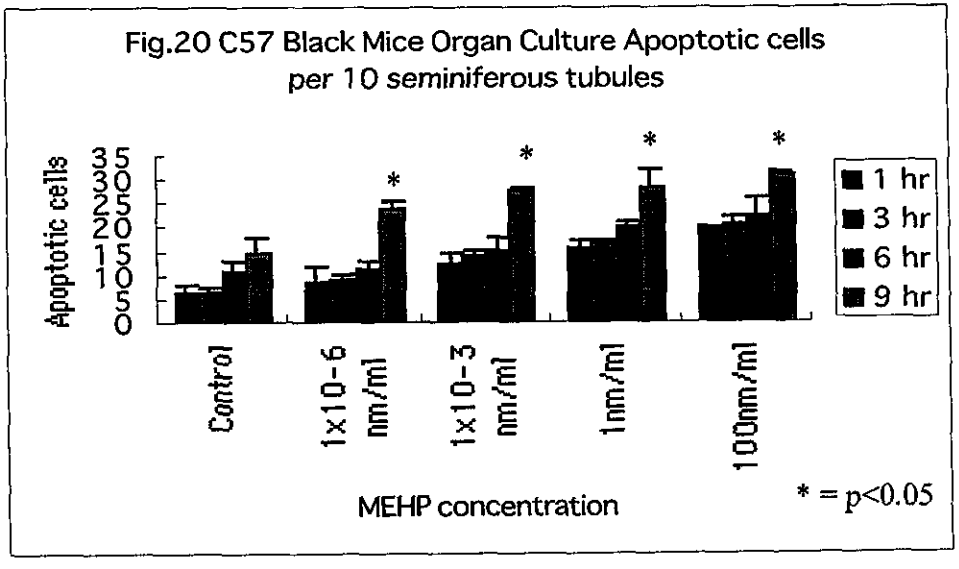


Fig. 3-20



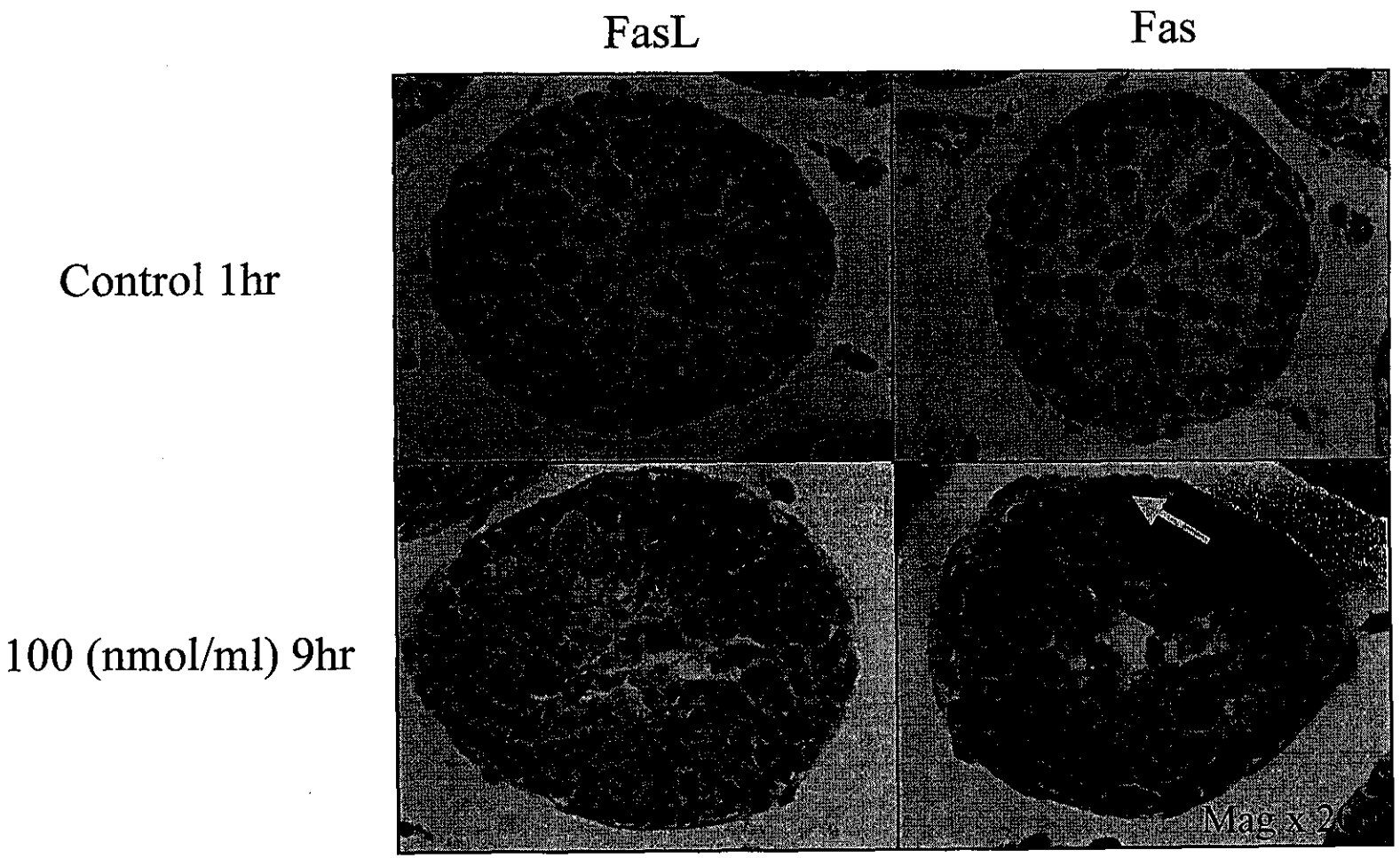
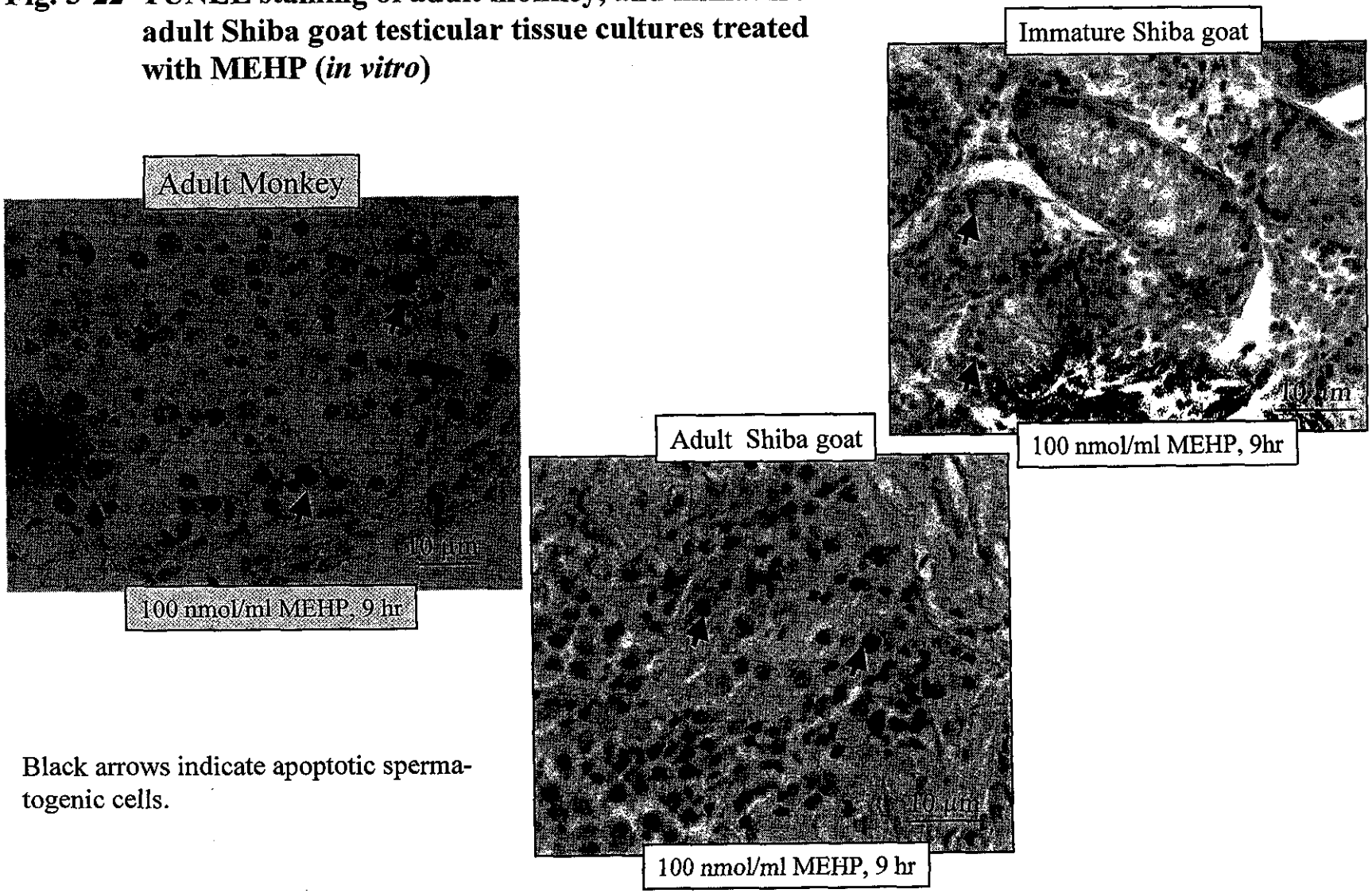


Fig. 3-21 Black and yellow arrows indicate presence of FasL and Fas, respectively.

Fig. 3-22 TUNEL staining of adult monkey, and immature and adult Shiba goat testicular tissue cultures treated with MEHP (*in vitro*)



Black arrows indicate apoptotic spermatogenic cells.

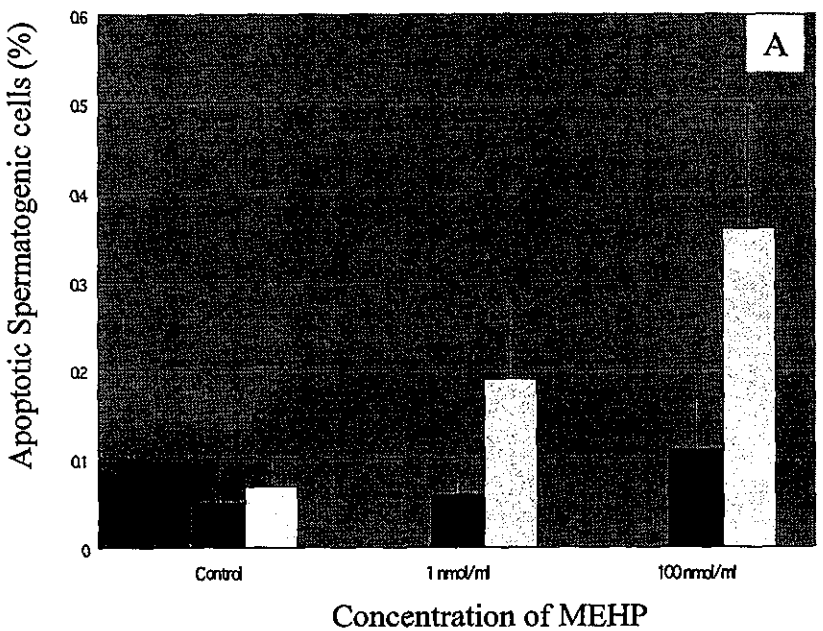


Fig. 3-23 Percentage of apoptotic spermatogenic cells in control and treated groups.

A. MEHP-treatment in the adult monkey testicular tissue culture. Apoptotic spermatogenic cells increase in time-and dose-dependent manners.

B. MEHP-treatment in the adult Shiba goat testicular tissue culture.

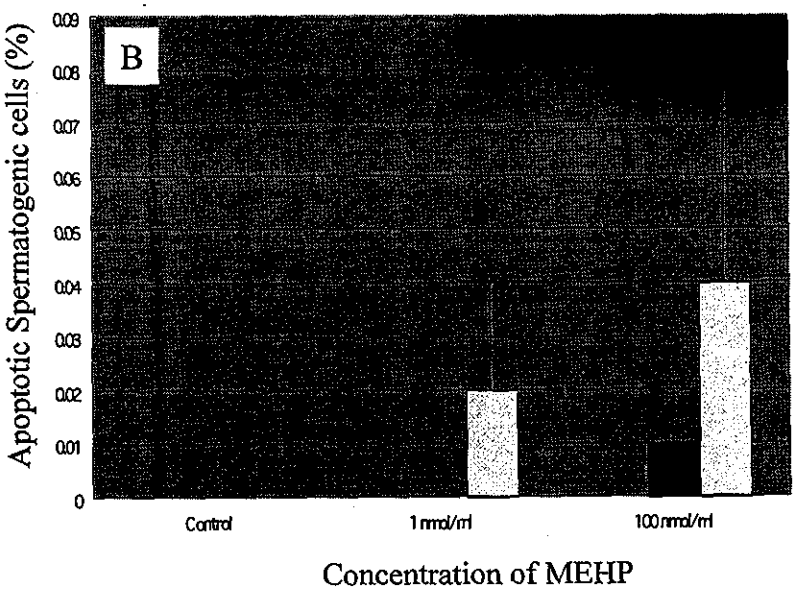


Fig. 3-24 Transmission electron micrographs