Effect the Glycerol of the Male Reproductive System in Male Albino Rats: Histological and Pathology

Nafisa. M. Batarfi

Department of Biology, Faculty of Science for Girls, King Abdulaziz University, Jeddah, Saudi Arabia
dr.Nafisa1_m@hotmail.com

Abstract: Glycerol is used in the pharmaceutical and medicine as a means to improve the smoothness and provide hydration and is used widely as a laxative therefore found in cough syrup and phlegm, toothpaste and in most soap and mouthwash products and skin care is that increasing daily use influential T. harmful happen in the long run Glycerol; Glyceri: 1,2,3-Propanetriol used in the current study (50) of male rats white experiments type Swiss albino rats ranging weights of 200-300 grams, which was obtained from the Animal House, King Fahd Center for Medical Research of the University of King Abdul Aziz in Jeddah, mice were injected in the background muscle dose of glycerol per day at a rate of 10 mg / Kilogram of body weight for 4 weeks by injection into the muscle and number) 20) rat and another group was injected for 8 weeks and the 20 rat study that injection of glycerol muscle causing damage testis in the form of focal destruction of large numbers of tubules and led to a significant decrease in the weights of the testes and epididymis tail. **(Testis) le**d to dilate blood vessels and the proliferation of internal germ epithilum lining her, cold plasma tissue Interconnection in neutered rats and some tubule sperm and spacing and disorder germepithilum and the rush of some cells of the cavity, in addition to necrosis sperm cells and germ cell and Sertoli atrophy some nuclei and also thickens the membrane basal tubule and the incidence of cirrhosis of the clear and sharp divisions and distortions and flake and analyzed in the cellular content looks like in the pathogenesis of cancer cells in the testes of group treatment for 8 weeks. (**The epididymis**) - explained histological examination irregularity and increased basal membrane thickness of pipe culvert and crash edge brush border epithelial lining of the cavity is filled with his sperm cells scaly, dead biodegradable fabric of the charge and the formation of a blood stasis between the pipes. **(Seminal vesicle)** histological shortage examination significant .rise in the mucous layer sperm and a few folds overlooking the cavity and the lack of epithelial thickness glandular out, which has been associated with the small size of the cells and nuclei and the decrease in the number and size of the vesicles glands oral and breadth of the special class, cold lymphoid layer epithelial addition to the sharp epithelial crash.
[Nafisa. M. Batarfi. **Effect the Glycerol of the Male Reproductive System in Male Albino Rats: Histological and Pathology.** *Life Sci J* 2015;12(4):1-11]. (ISSN:1097-8135). http://www.lifesciencesite.com. 1

Keywords: Glycerol .Testis..Sertoli cell .Leydge Cells. . Ducts epididymis. Seminal vesicle

1. Introduction

All over the world at the rate of glycerol production is 2000 500000 tons per year. And glycerol has widespread use and can be in the modern industrial and professional and consumer products. Glycerin is used as an ingredient in many products and feedstock in industrial applications for the manufacture of products such as soaps, detergents, glycerol esters. It is found in consumer products such as pharmaceuticals, cosmetics, tobacco, food and beverages and is present in many other products such as paints, resins and paper. There is the possibility of occupational exposure through inhalation and contact with skin. Consumers may be exposed glycerol for oral and skin. Smoking may lead to additional absorption glycerol by inhalation uccir data from studies on humans and animals as glycerol absorbs quickly in the intestines and stomach, and secrete extracellular (Lin in 1977, Tourtelotte 1970). And phosphorylated glycerol predominantly in the liver (80-90%) and kidney (10-20%) and integrated into the standard metabolic pathways for the formation of glocos and lglicugen (Tao 1983, Lin 1977). Also found glycerol kinase in the intestinal mucosa, fatty tissue structure and lymph, lung and pancreas tissue. It can also be combined with glycerol, free fatty acids in the liver to form triglycerides (fat) that are distributed on the adipose tissue. The turnover rate is directly proportional to the levels of plasma glycerol (Bortz 1972). In a study with limited reports, received twelve female mice 27 / mg glycerol/kg of body weight through the feed tube (Jansson Woody Roy). The notes included muscle spasms and appeared within 2.5 hours of dosing ..showed macroscopic examination of the deceased and the survivors of hyperemia pylorus, the small intestine and cerebral meningitis (3 animals), and congestion of the lungs and spleen pale. According to Hine (1953) Acute toxicity of synthetic or natural glycerin in mice and guinea pigs. Again been limited reporting, however, both types showed similar clinical signs (the earthquake and convulsions) and the results of macroscopic (hyperemia of pylores pale and intestines, spleen, lung congestion). And glycerol affects in mammalian cells and consists of a glycerol-3-phosphate, catalyzed by acyltransferase glycerol-3-phosphate (GPAT) [1 Bell and Coleman (1980]. As it

happens in many metabolic reactions of other fats, and many forms Estelle to stimulate the move.at least four different genes encoding GPAT natural 1-4, which differ in the expression pattern of Ansjh, and the sensitivity of the N-ethylmaleimide. GPAT1 and GPAT2 is the basic of mitochondria, while the translation GPAT3 and GPAT4 in the endoplasmic reticulum [Wendel, et al. (2009) 2]. while determines GPAT1, GPAT3 and GPAT4 fat filling in tissues and associated activities with triglycerides and links phospholipids, and the expression pattern GPAT2 is more prominent in the testis [3 Wang et al. (2007]. GPAT2.

2. Materials and Methods

Experimental animals

Used in the present study (50) of male rats white experiments type Swiss albino rats ranging weights between 200-300 grams, which were obtained from the Animal House, King Fahd Medical Research of the University of King Abdul Aziz in Jeddah Center, and left to adapt to the conditions for a week, at room temperature.

The mice were divided into three groups:

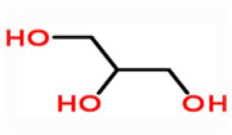
The control group G1: given standard daily meal and number 10 mice

Treatment Group G2: glycerol dose given daily for 4 weeks by injection into the muscle and number) 20) mouse

Treatment Group G3: glycerol given dose daily for 8 weeks by injection into the muscle and number) 20) mouse

Chemicals used:l

* Chemical formula: C3H8O3



Glycerol; Glycerin: 1,2,3-Propanetriol

Glycerol; Glycerin: 1,2,3-Propanetriol. It was dilution by distilled water to 50% and the rats were injected daily in the background muscle by 10ml / kg

Histological study

The anatomy of the mice in the fourth and eighth week and respectively. It was by ether anesthesia, and anatomy and took the testis and epididymis Craw sperm. Been chopping testicular and Ducts epididymis and Craw sperm into small parts and put them in formalin regulator neutral Sticky concentration of 10% has been followed standard methods of dewatering Dehydration and clarification Clearing and landfill in paraffin wax was the work of sectors histological cross sections thickness of 3 microns of tissue samples to the control and treatment. And Standing with Hematoxylin & Eosin (Bancroft & Stevens, 1978).

3. Results

The control group G 1

Testis

Surrounded by testicular crust fibrous thick tunica followed from the inside layer vascular tunica vascular of connective tissue desultory sang blood vessels and contains the testes many clipstubul sperm Somniferous tubules circular and elliptical (Fig1) and surrounded tubullayer of longitudinal cells splayed symmetry through the smooth muscle and spectrally called myoid cells (Mc), followed by the inside of the basement membrane and basal lamina (BL), which clearly dyed with H & E, as surrounding this tubule connective tissue between Leydig cells (Fig 2).

Sertoli cells

Columnar cells) long based on the basement membrane of the sperm Foreign edge where irregular branched into many cytoplasmic extensions that are associated with extensions neighboring Sertoli cells, wrapped around the developing germ cells of epithelial germ (Fig3)). Sertoli cells and contains a huge basal part contains a large nucleus of pineapple or oval-shaped and surrounded by a nuclear membrane and surrounded by irregular thread cytoplasm separated from the rest of the cellular organelles.

Leydig cells

Leydige show between inter neutered rats and Corpuscular form or several ribs and plasma membrane surrounded by many cytoplasm extensions nuclei of non-circular central vesicular) (Fig4) and collects cells ledge next to the blood vessels.

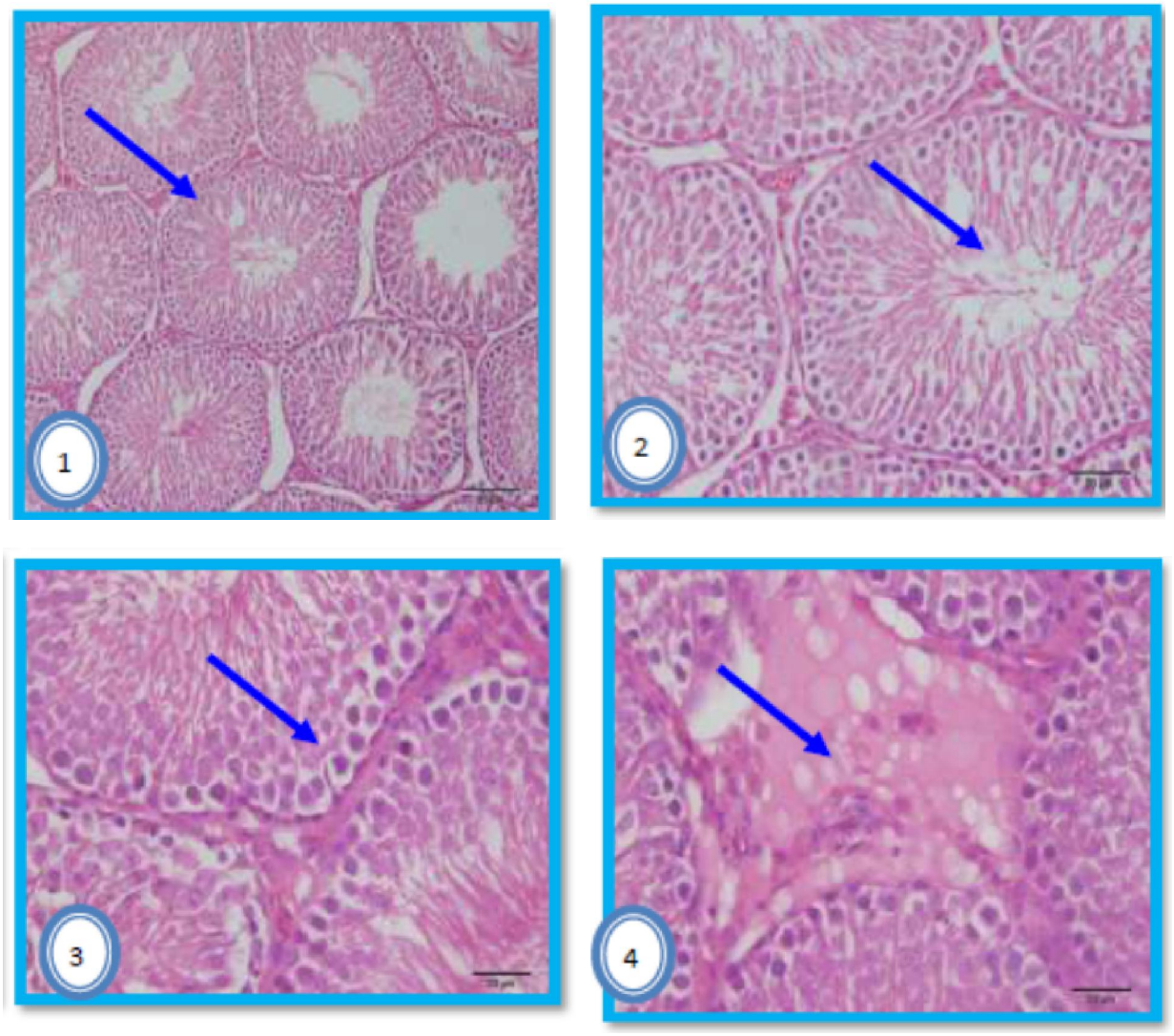
Ductus epididymis

Epididymis histological consists of a long tube or channel look across-sections Fig -5-6-7-8-)) in the form of a circular or oval clips and lining epithelium simple vertical or normal columnar false where they appear in some areas, two levels of nuclei surrounded epithelial channel epididymis basilar membrane contains some long nuclei of muscle cells similarities my epithelial cells and is surrounded by a thin of circular smooth muscle and separates the channel segments padding of connective tissue.

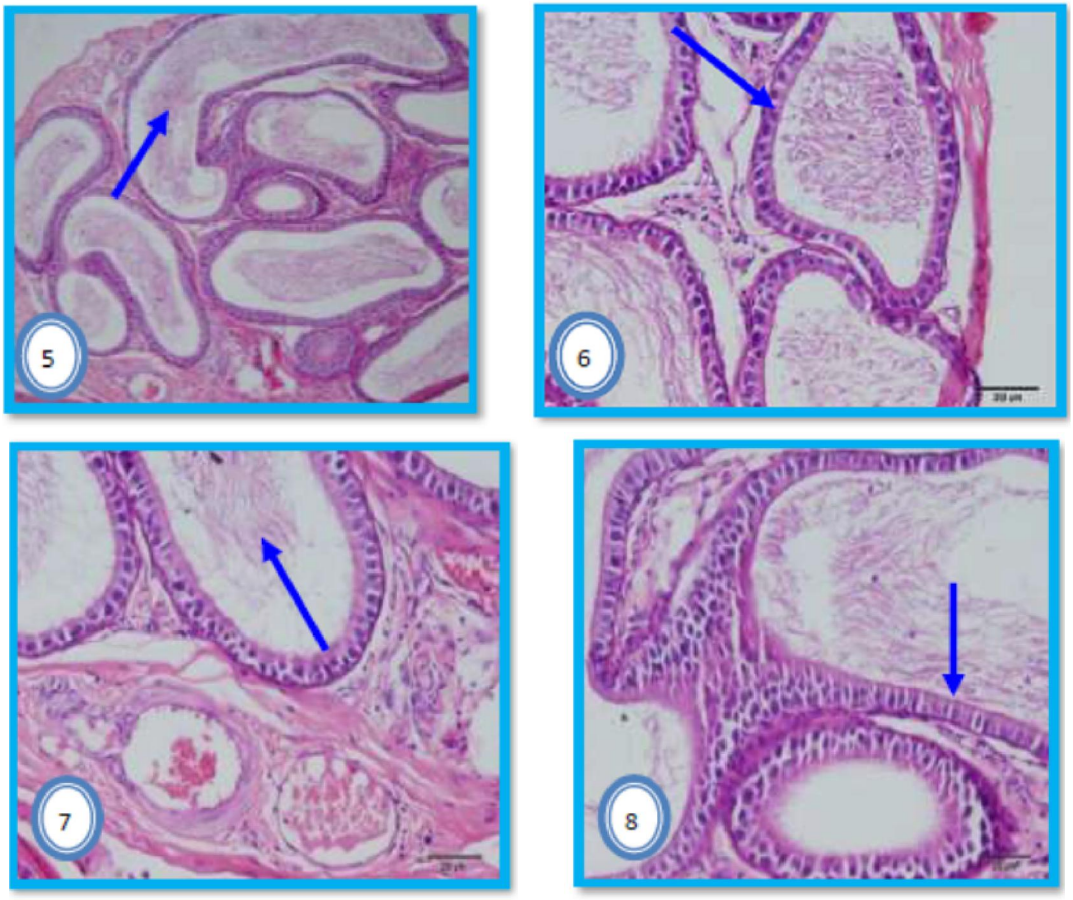
Seminal vesicle

Neighborhood Craw sperm consists of an external charge of connective tissue containing elastic fibers thin casing of smooth muscle consists of a circular layer of the inside and long for the outside (Fig 9-10) many mucous layer folds in rats at puberty and where branching tucks primary to the folds of the secondary and three-span inside cavity which leads to the formation of many closets installation normal tissue as reported in rats (Cavazos, 1975) and other mammals (Junquiera et al., 1989 and contains gland cavity severe Oiossinah pigmentation materials) Fig 11-12(.

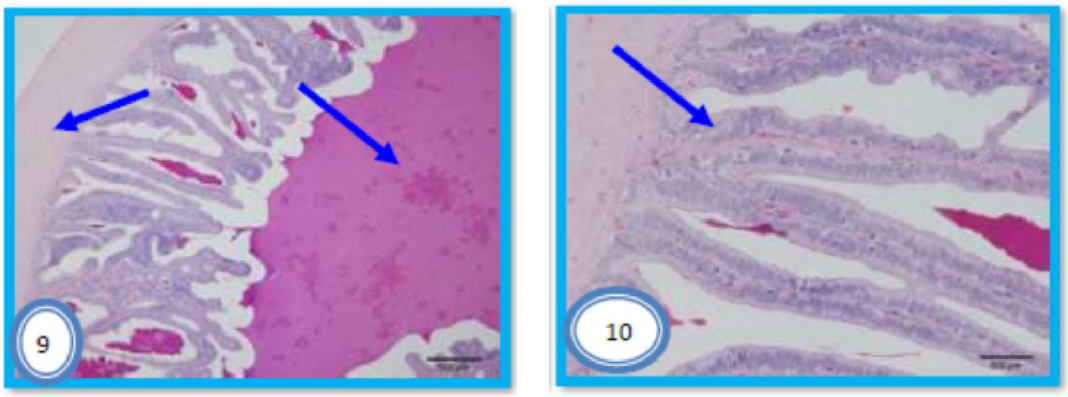
The control group G1
Testis

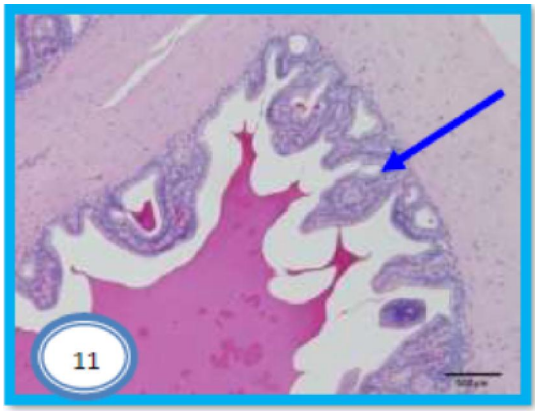


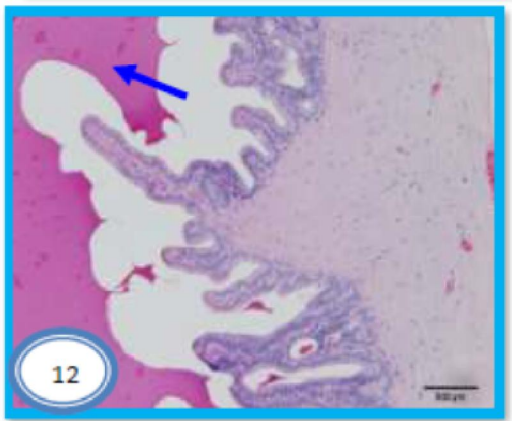
Transverse sections (T.S.) of tests of male rate for control group (G1).
1. Somniferous tubules circular shape and a clear show of their interconnection and surrounded by fibrous tissue layer of connective tissue (arrow) (H & E; x40)
2. Tubule sperm glass show where the sperm inside the cavity arrow) (H & E; x 100)
3. Interfaces between cells tubule sperm cells show clearly Ledge (arrow) H & E; x 400
4. Sertolicelleclearly show the membrane at the base of the tube sperm arrow) H & E x 400



Transverse sections (T.S.) of Ducts epididymis of male rate for control group (G_1).
5. The cross-sections appear in the form of a circular or oval clips (arrow) (H & E; x 400)
6. Lining simple vertical or columnar of natural false (arrow) (H & E; x 100)
7. Sperm appear in the channel epididymis mature and sound cavity arrow) ((H & E; x 100)
8. Appear in some areas, two levels of nuclei surrounded channel epididymis epithelial basal membrane contains some long nuclei of cells similarities (arrow) ((H & E; x 100).







Transverse sections (T.S.) of Seminal vesicle of male rate for control group (G_1).

9. Wall Craw sperm consists of an external charge of connective tissue containing elastic fibers and thin cover of smooth muscle consists of a circular layer of the inside and outside of the long ((arrow) ((H & E; x 40

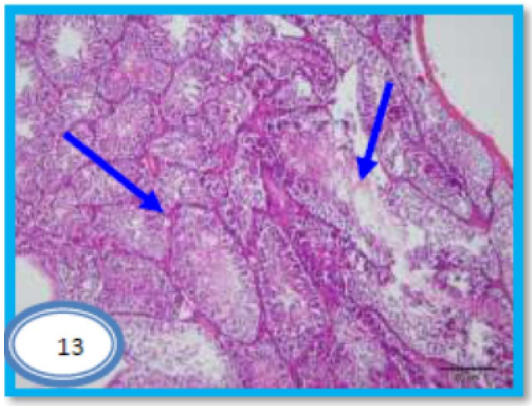
10. Mucous layer be bent and many folds where tucks subdivided into primary and secondary (arrow) ((H & E; x 100

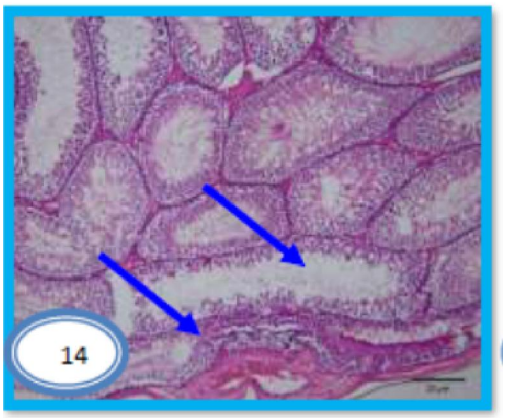
11. Vertical glandular epithelial simple contain little of the basal cells, which is based on the basement membrane. (Arrow) (H & E; x 100)

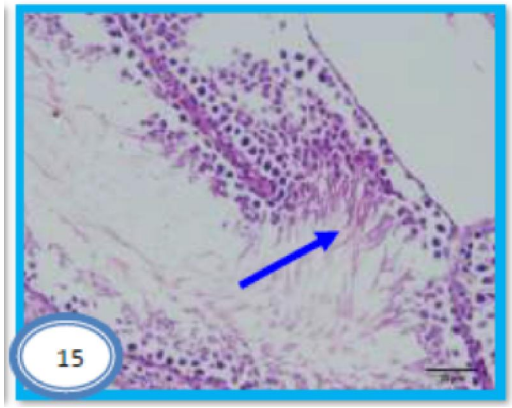
12. Semen shows clearly within the lumen of the vesicles (arrow) (H & E; x 100)

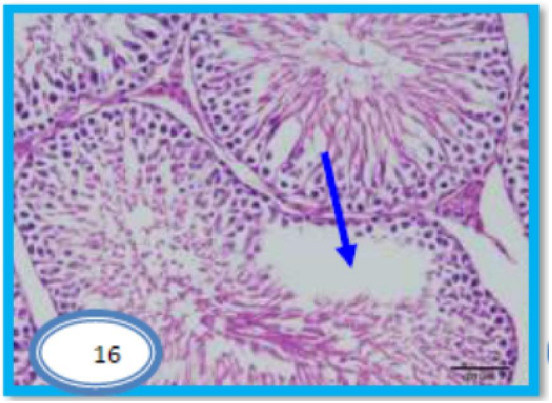
Testicular treatment G2

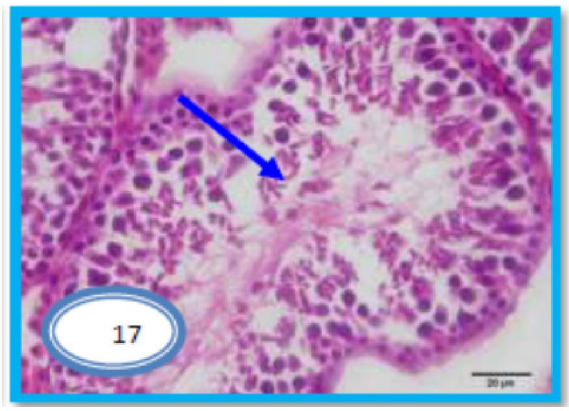
Transverse sections (T.S.) of tests of male rate for treatmentgroup (G_2).

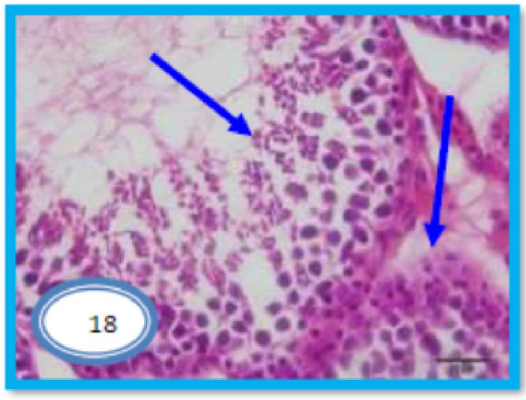




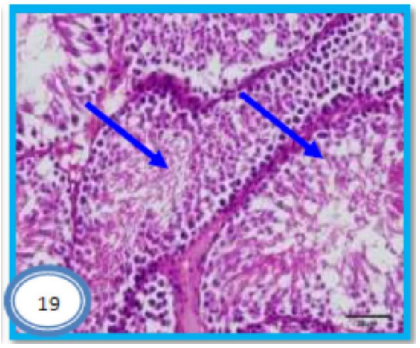


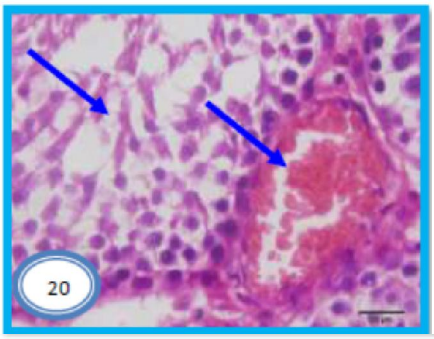


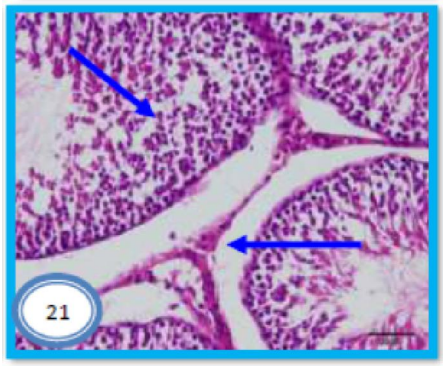


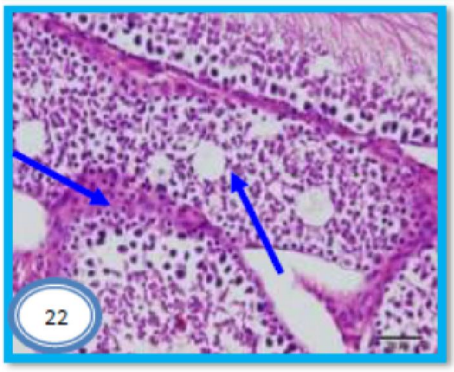


13. Change the shape of somniferous tubules and distortions and clear flake and analyze cells and hemorrhage between the tubules arrow) (H & E; x 40 arrow)
14. Distort the clear inside the tubes and the change in size and shape and the recession and bloody secession in the epithelial layer surrounding the tube was sperm (arrow) (H & E; x 400
15. Enlarged image of the tube sperm decomposition of the pipe wall and nicrosis show the nuclei to cell death and peel off the cells and the lack of the death of sperm (arrow)
(H & E; x 100)
16. Emergence of gaps inside the tube sperm led to the decomposition of sperm cells (arrow)
(H & E; x 400)
17. Flake and necrosis and death of sperm cells and rush inside the cavity (arrow) (H & E; x 400)
18. Sharp Zhou necrosis and deformation in the sperm and the separation of cells from each (arrow)(H & E; x 1000)



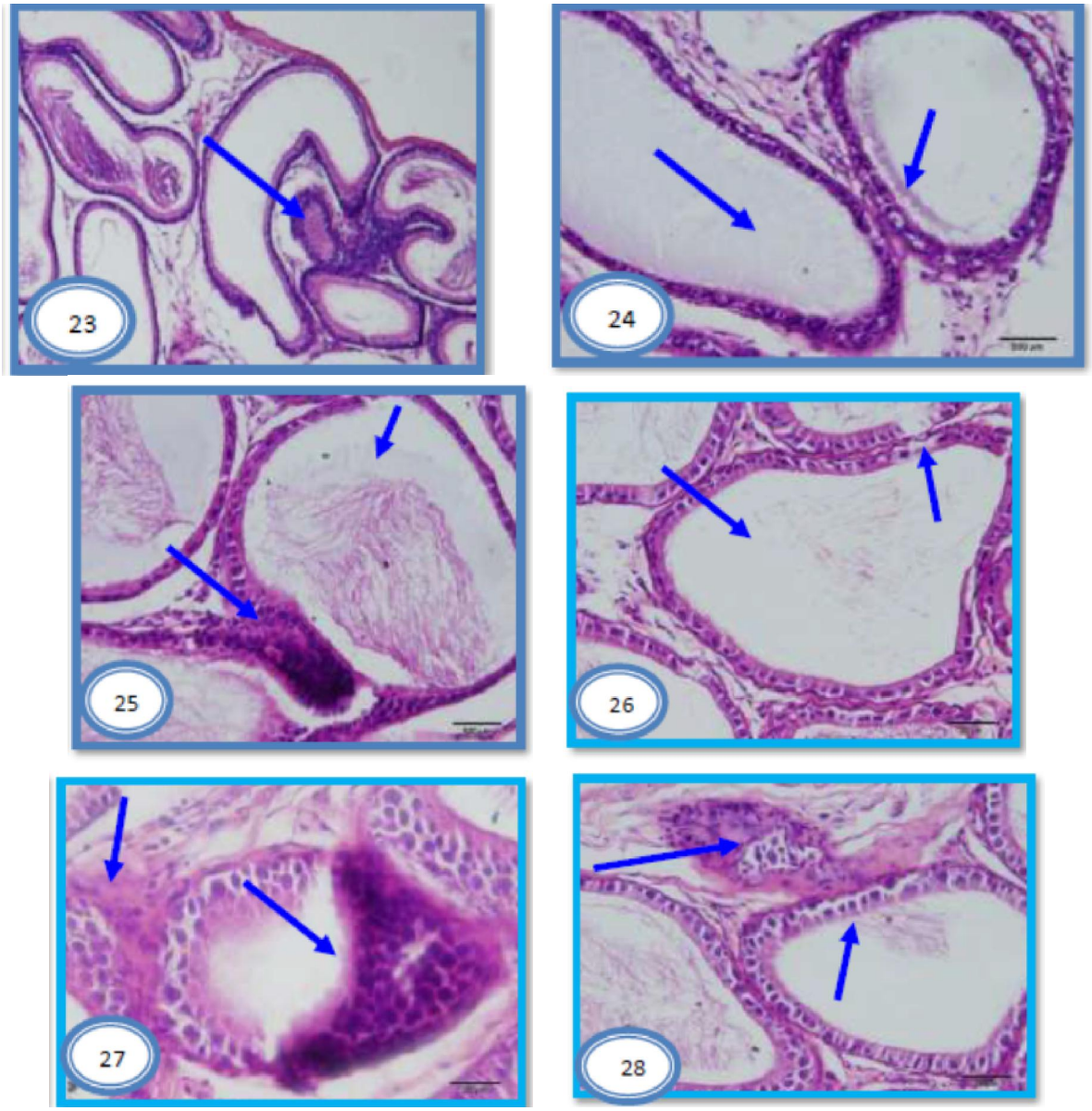






19. Shows the bloody recession clearly between somniferous tubules and flake clear in the cells and analyzed sperm cells (arrow) (H & E; x 100)
20. Elongation somniferous tubules and change shape ring nuclei and necrosis and programmed cell death and severe bleeding between the tubules ((arrow) (0 (H & E; x 40)
21. Emergence of gaps inside the tubes and the decomposition and death of sperm cells (arrow) (0 (H & E; x 40)
22. The clear separation between the somniferous tubules and analyze cells Ledge and faded fabric interface (arrow) (0 (H & E; x 4)

The epididymis treatment group G2



Transverse sections (T.S.) of Ducts epididymis of male rate for treatment group (G_2).

23. The epididymis show clips distorted and variable formats (arrow) (H & E; x 400)

24. Louhz lack of epithelial to culvert and increase the thickness of the granules positive staining in cells and increase the thickness of the membrane basal susceptibility to pigmentation and the absence of sperm. (arrow) (H & E; x 400)

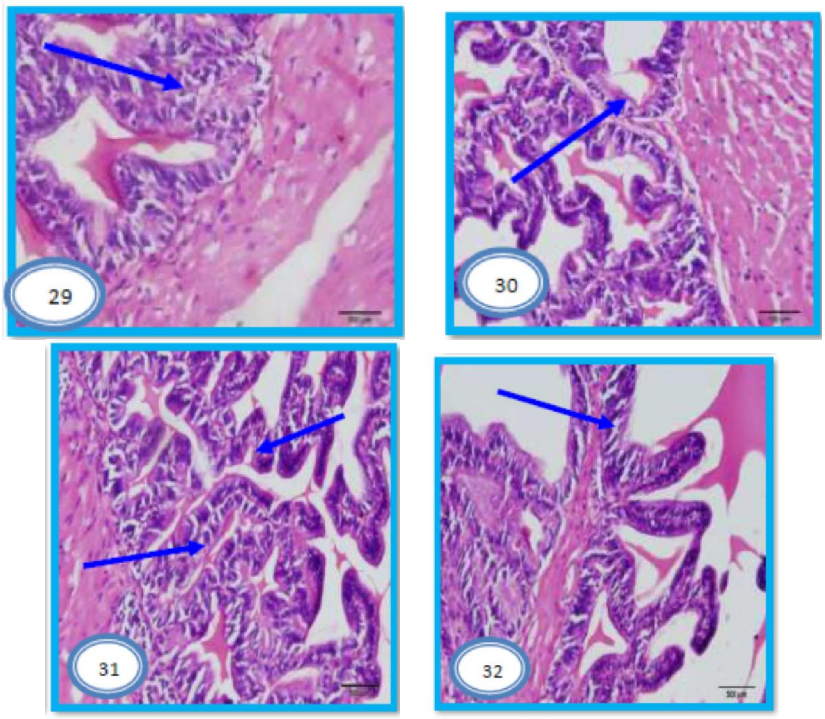
25. Also found deformation epithelial channel and deformed brush border and is full convoluted fluid secretory and cellular remnants and abnormal sperm (arrow)
(H & E; x 400)

26. Irregular epithelial thickness of the channel and the disintegration of epithelial and not to discriminate cells limits and the cavity is filled with remnants of cellular and animals is natural. (arrow) (H & E; x 400)

27. Notes: biodegradable fabric interconnecting irregular surface channel epididymis and intensity of pigmentation and apical cytoplasm edge brush border (arrow) (H & E; x 400)

28. Presence of germ cells dead inside the cavity and necrosis clear and death programmer cells (00 (H & E; x 4)

Seminal vesicle treatment group (G2)



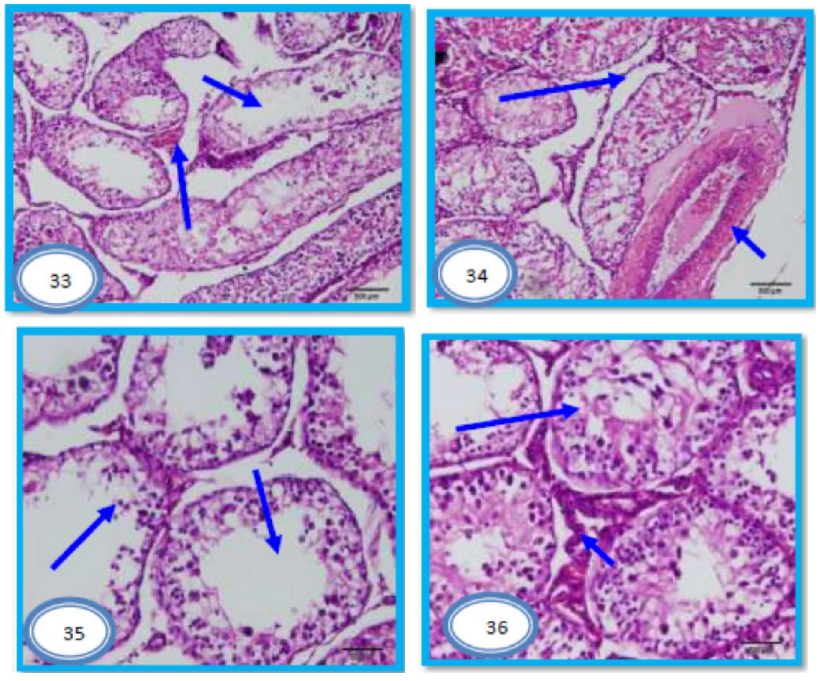
Transverse sections (T.S.) of Seminal vesicle of male rate for treatment group (G_2).

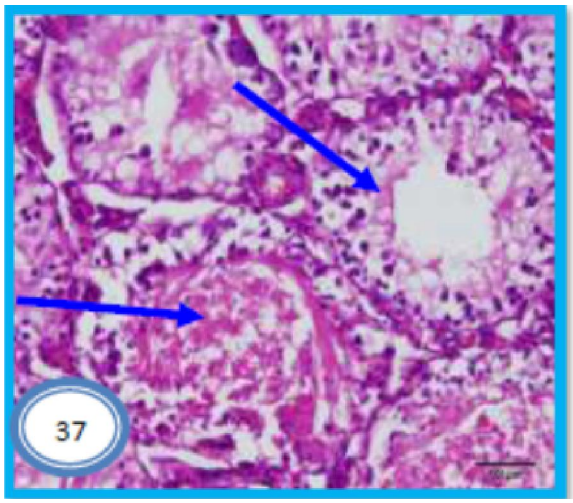
29. Palace mucosal folds class overlooking the cavity and increase the thickness of the special class, which has been associated lack of high mucous layer Bahoislat sperm (arrow) (H & E; x 400)

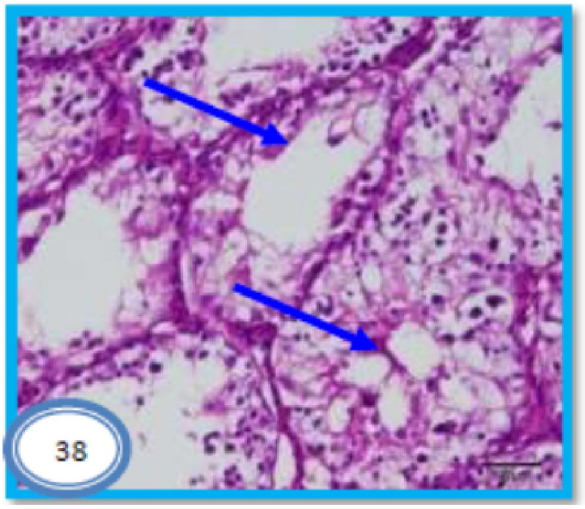
30. Small size of the mucous layer and the size of the nuclei and the lack of vesicles value and content of granular cells (arrow s) (H & E; x 400)

31-32. Nominated limited lymphocytes mucous and lack of limited materials secretory cavity seminal vesicles (arrow) (H & E; x 400)

Testicular treatment G3







Transverse sections (T.S.) of tests of male rate for treatment group (G_3).

33. Somniferous tubules distorted and variable shapes and sections show shows focal decomposition and decomposition cell **inside the tubes (arrow) (0 (H & E; x 4**

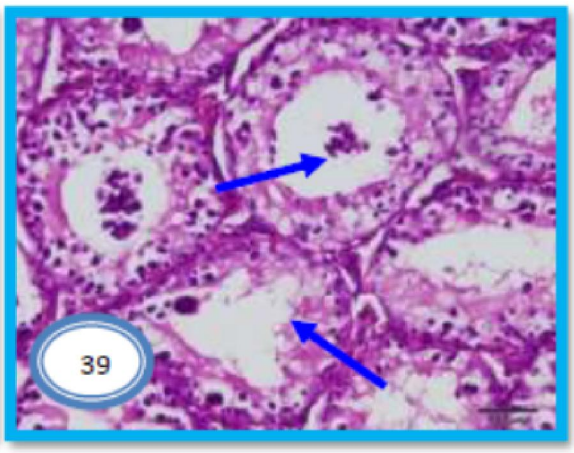
34. Shows the decomposition of the connective tissue between the somniferous tubules and fibrosis clear to the severity of the cellular inflammation. Dilate blood vessels and blood stasis within the blood and the lack of epithelial thickness surrounding sperm (arrow) (H & E; x 400)

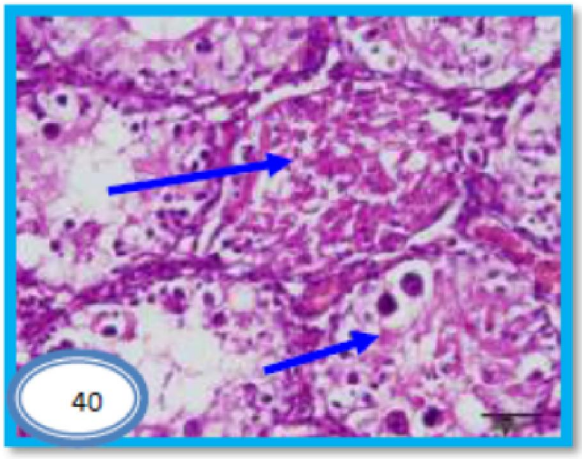
35. Change the shape of somniferous tubules and the dissolution of acute inflammation of the sperm cells and not to discriminate cells form nuclei and necrosis leading to cell death (arrow) (400 (H & E; x400)

36. Fibrosis clear inside the tube sperm deformation and the lack of a clear presence of sperm and warp the fabric interface and death of cells Ledge and analyzes (arrow) (H & E; x400)

37. Apoptosis clearly shows strongly inside the cavity and loss of sperm sertoli cell- (arrow ((H & E; x 400)

38. The complete dissolution of acute inflammation of the tubes and the connective tissue between the tubules and severe cell death, which is called, programmed death (arrow) (H & E; x 400)

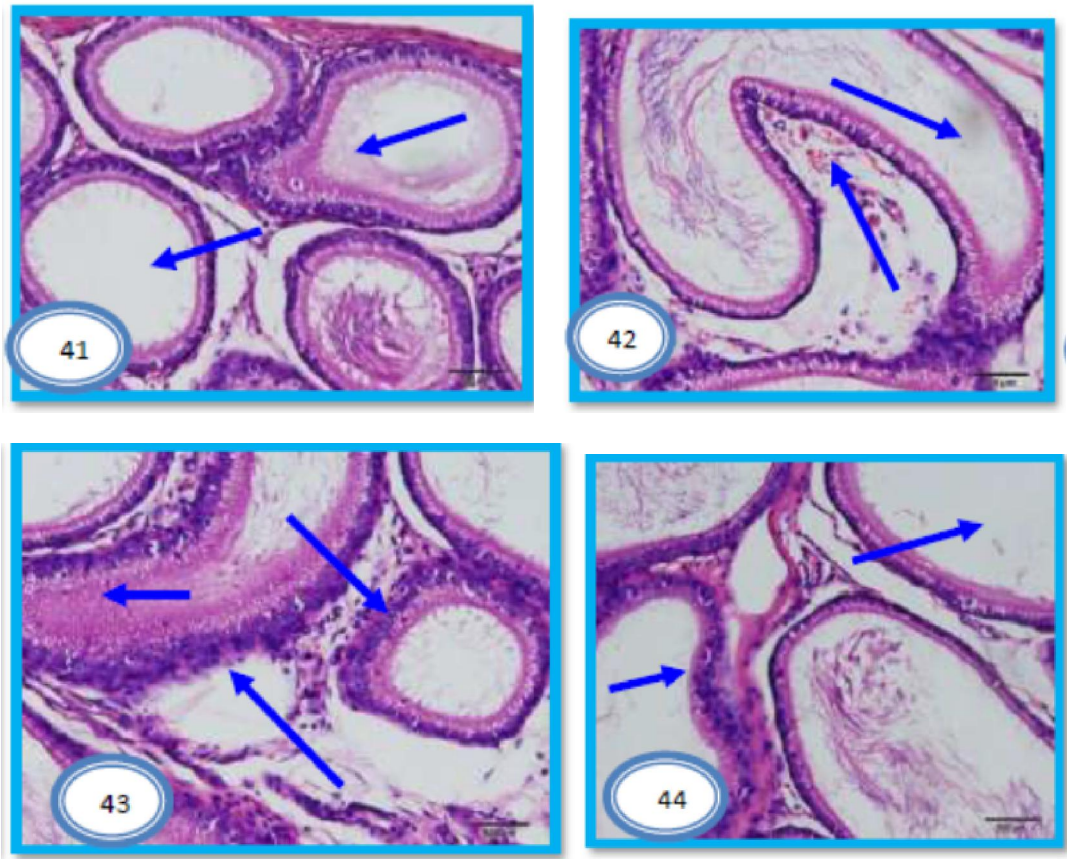




39. Sloping cells and scaly within somniferous tubules and analyzes clear sperm cells (arrow) (H & E; x 400)

40. Programmed death of cells and sperm severe distortions in the form of pipes, called testicular cancer (arrow (H & E; x 400)

Ducts epididymis treatment group (G_3).



Transverse sections (T.S.) of Ducts epididymis of male rate for treatment group (G_3).

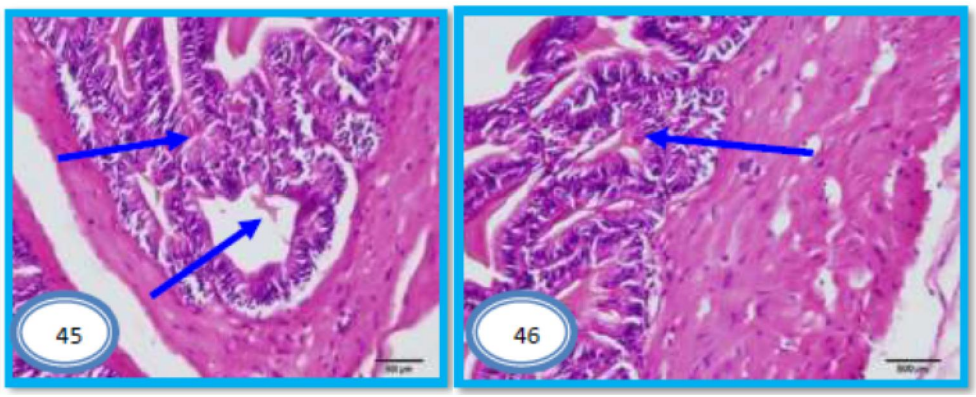
41. Erratic and increase the basal membrane thickness of pipe culvert and crash edge of the brush border epithelial lining Him - (arrow) (H & E; x 400)

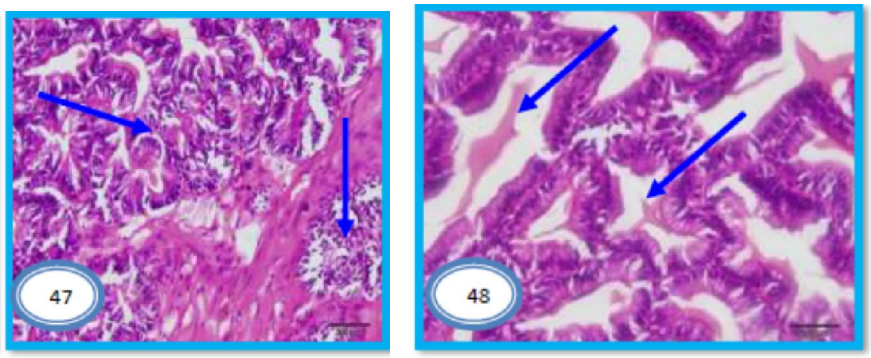
42. The cavity is filled with sperm cells and scaly dead and biodegradable fabric filler sharp and deformation of the circular and oval shaped sections. - (arrow) (H & E; x400)

43. Deformation focalepithilym epididymis and increase the thickness of the wall and the proliferation of epithelial cells and peel off some parts and Andavalla the cavity and deformed cells and the lack of particle content. (arrow) (H & E; x 400)

44. The lack of content in the epididymis sperm and completely distorted and her disappearance in some sectors (arrow (H & E; x 400)

Seminal vesicle treatment group (G_3)





Transverse sections (T.S.) of Seminal vesicle of male rate for treatment group (G_3).

45. Increasing thickness and glandular epithelial separation and lack of moral high in the mucous layer and analyze the epithelial membranes - (arrow) (H & E; x 400)

46. The severe deformation in the glandular epithelium and breadth of the special class and lymphoid infiltration of the epithelial layer in addition to the focal length of the deformed (arrow) (H & E; x 400)

47. Louhz proliferation of cytokine when the mucous layer base and a lack of clear secretion crash and was nominated for adenoid epithelial layer. (arrow (H & E; x 400)

48. The small size of the cells ansond nuclei and the decrease in the number and size of the vesicles glands oral and breadth of the special class and lymphoid infiltration of the epithelial layer in addition to the focal length of the glandular necrosis, analyzed and some parts (arrow((H & E; x 400)

Conclusion

Glycerin is a low-toxic oral and skin acute LD50 values exceeding 4000 mg / kg of body weight and high-dose levels, and signs of toxicity include allergies and inflammation of the digestive tract. Skin and eye

Studies suggest that irritate glycerol has a low potential for skin irritation and eye. And available human and repeated exposure to glycerol by mouth does not cause other adverse effects of local irritation of the stomach diseases. Prolonged treatment with glycerol than 10,000 mg / kg bw / day (20% in the diet), which is consistent with the results of other studies. Male rats indicate that oral administration of glycerol up to 20 weeks have had little effect.

Which is expressed in the germ cells in mice testicular growth, • Based on the previous multi-study), and suggested GPAT2 to be a candidate "testicle" cancer gene (gene CT) [6]. CT genes encode proteins which are limited to male germ cells and tumors of several different histological origins of expression, but the gene products CT absent or expressed at low levels in normal somatic cells .Usually regulates expression through epigenetic mechanisms, they are immune. Because immunological characteristics, and is being considered in the growing lists of CT antigens as targets for cancer vaccines. Cells expressing high levels of GPAT2. GPAT2 showed a clear result in this form of cancer cells that can enhance GPAT2 of cell proliferation and survival.

The glycerol. GPAT2 samples in the testis and that when examining the cells in the testis sectors seen apoptosis, a type of cancer. Examination of apoptosis and GPAT2 are expressed in human testis and many types of cancer.

References:

1. Lin, E.C.C., Glycerol utilization and its regulation in mammals, Ann. Rev. Biochem. 46: 765-95,1977 (52) . Nutr. 7 (1983), 479-488 (67).
2. Tourtelotte, M.D. et al., Cerebral dehydration action of glycerol, Clinical Pharmacology and Therapeutics 13(2): 159-171, 1970 (68).
3. Bell RM, Coleman RA (1980) Enzymes of glycerolipid synthesis in eukaryotes. Annu Rev Biochem 49: 459–487. doi: 10.1146/annurev.bi.49.070180.002331.
4. Wendel AA, Lewin TM, Coleman RA (2009) Glycerol-3-phosphate acyltransferases: rate limiting enzymes of triacylglycerol biosynthesis. BiochimBiophysActa 1791: 501–506. doi: 10.1016/j.bbalip.2008.10.010.
5. Wang S, Lee DP, Gong N, Schwerbrock NM, Mashek DG, et al. (2007) Cloning and functional characterization of a novel mitochondrial N-ethylmaleimide-sensitive glycerol-3-phosphate acyltransferase (GPAT2). Arch BiochemBiophys 465: 347–358. doi: 10.1016/j.abb.2007.06.033.
6. Bortz, W., Glycerol turnover and oxidation in man, The Journal of Clinical Investigation 51: 1537-1546, 1972 (34).
7. Cavazos, LF, (1975): Fine structure and functional correlates of male accessory sex gland of rodents. Department of Anatomy, Tufts University, School of Medicine, Boston, Massachusetts.
8. Bancroft, JD, and A, Stevens (1978): Theory and practice of histological techniques. Longman Inc. New York, 1st Ed. 240 pp.
9. Junquiera, LC, Carneiro J, and RO, Kelley, (1989): Basic Histology, a LANGE medical book ninth edition, Copyright by Appleton and lange 260pp.

3/8/2015