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RESEARCH ARTICLE

Effect of Sildenafil citrate on Ventral Prostate of Albino rat (Ultra structural Study)

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Abstract

In earlier studies much attention was paid on toxicology but the study of reproductive physiology was not paid more attention as the fertility point of view. Sildenafil Citrate compound studied for its in the male reproduction mainly fails to have useful effect, long term of this compounds have their effect on various organs and it will be bad in the regulation of physiological function in male. Sildenafil citrate is not a hormone nor a herbal supplement .The present study design to study the effect of Sildenafil citrate on prostate at altra structural level.

Keywords- Physiology, Sildenafil, fertility, supplement, prostate.

INTRODUCTION

The compound Sildenafil Citrate was first studied by Goldstein and collegues provided security by the medical community with regard to the effective mechanism of action ,pharmacokinetics [1]. The various pharmaceutical compounds studied for its use in the male reproduction mainly fail to have useful effect. The long term of many compounds have their effect on various target organs and it will be bad in the regulation of physiological function in the male. The use of Sildenafil citrate for the treatment of the heart disease , shown its usefulness for prevention of blood clots, by hampering the action of platelets and also enhance blood flow by relaxing the wall of arteries and veins[2]. The Sildenafil citrate when tested in the male , can divert the blood flow from body part to the veins and arteries of penis which results in to the errection of the penis, The more blood flow, accelerate the function of target organs in male and may cause the damage to the target organs[3]. It has been reported that some male who were given Sildenafil reported having erection which meant the drug was mediating with a particular bits of body chemistry2. In order to interpret the result of any pharmaceutical compounds in animals , it is necessary to understand the reasoning behind the design of experiment [4]. The

original idea of the effect of pharmaceutical agents testing was that the drug should be given to animals.

EXPERIMENTAL DETAILS

Selection of experimental animal-

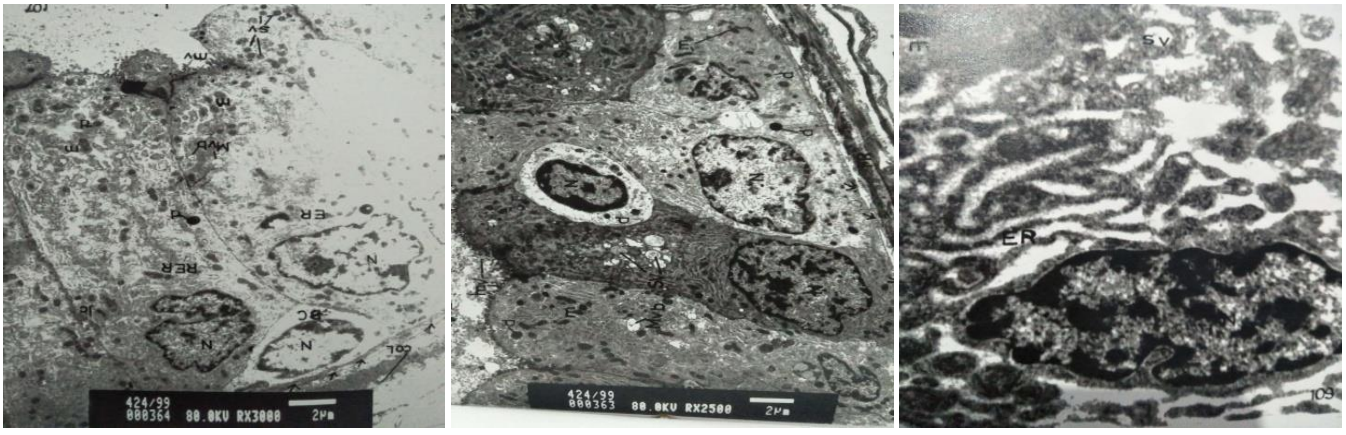
Necessary number matured male albino rat of wistar strain of proven fertility were provided from Haffkin Biopharmaceutical.

Experimental Design-

The albino Wistar male rats were divided into two group in laboratory condition, first group of experimental male rats were fed orally with Sildenafil citrate compound at a dose of 0.5mg /animal/day for 60 days and controls were orally fed with equal volume of distil water. Dosage to be administrated are decided on the basis of the literature available concerned.

Transmission of Electron Microscopy-

Tissue whose ultrastructure was to be studied were removed from animals after completion of experiment, sliced into 1mm pieces in a fixative (3% Glutaldehyde), proceed for E.M. for final viewing sections were observed and photographed on Jem-100s and Joel Electron Microscope.



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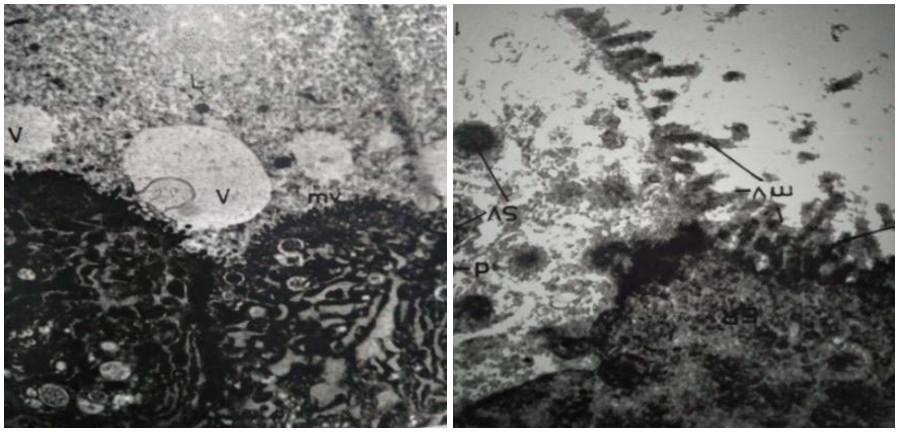

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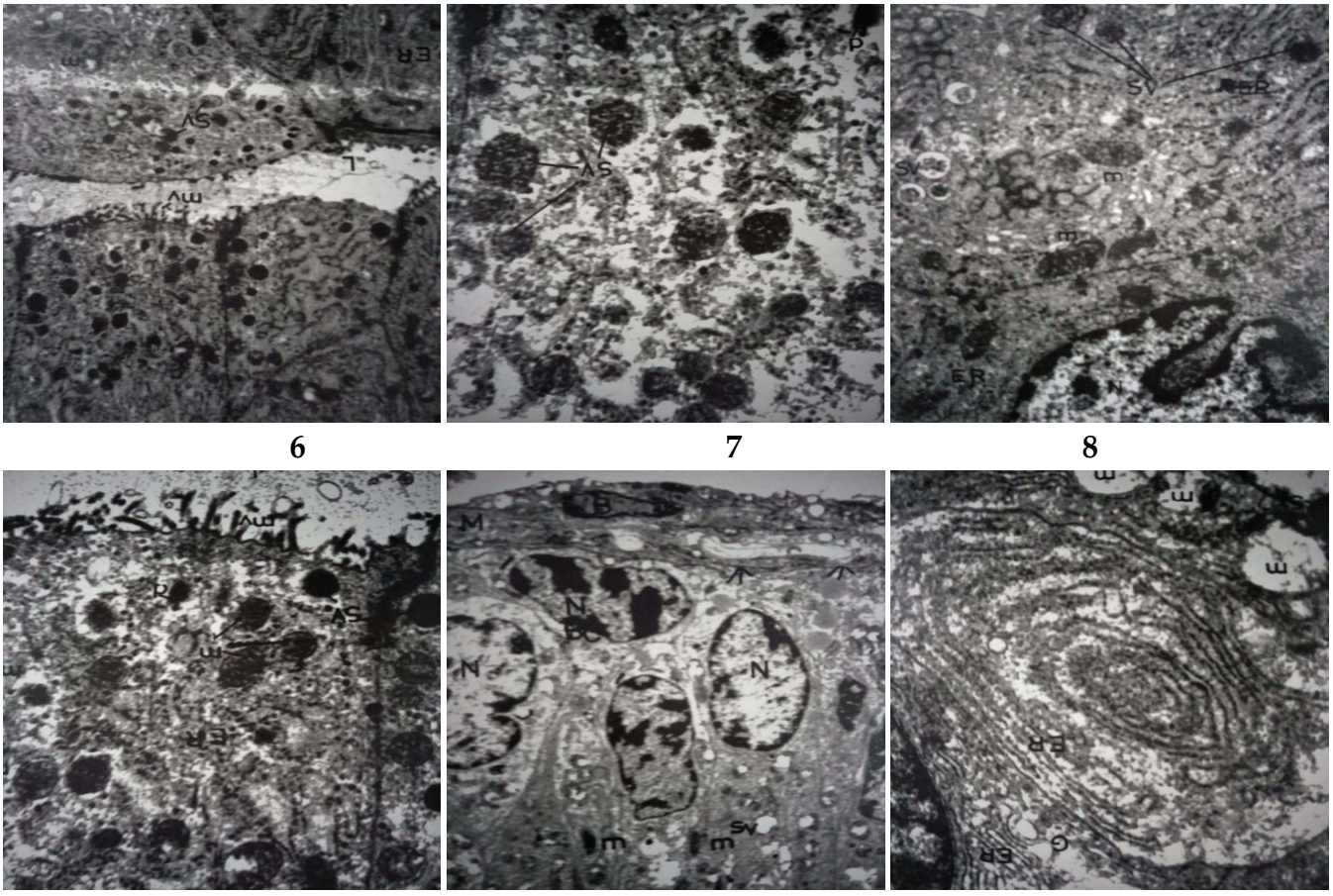
Fig1-Electron micrograph of the ventral prostate of the 60 days control rat showing psoudostritified collagen columnar epithelial cells with other cell like basal cell. Note the collagen fibers (COL), basal lamina (Arrow) with basal cell (BC) and large nuclei (N) with few cytoplasm organelles . Compact cell to cell tide junction (JC) of a small dense to large pale cells and other very pale cells reaching to the lumen of gland. The cell are moderate in bright with irregular nuclei abundant granular endoplasmic reticulum and a number of dense granule through out the cytoplasm. The large more lightly stain cell which reach the lumen contain rounded to slightly nuclei. A dense body (DB) is embedded in the dense material. X3000.

Fig 2- Electron micrograph of the ventral prostate of the 60 days control rat showing wide variation in form ,size and density in the epithelial cell which lies these glands. The cell range from cuboidal to psoudostritified columnar and small dense to large pale cell with a vesicle in cytoplasm. Note compact cell to cell tide junction , endoplasmic reticulum (ER), secretary vacuoles (SV), multivesicular body (mvb), microvilli of vesicular cell (mv), lumen with flocculent material. X25,000.

Fig 3- Electron micrograph of the ventral prostate of the 60 days control rat showing portion of epithelium with extensive development of granular endoplasmic reticulum (ER) and large Golgi complex (G) with dense indented nucleus(N), Mitochondria (m), secretary vesicle (SV) number of dense granules seen in cytoplasm.X15,000.

Fig 4- Electron micrograph of the ventral prostate of the 60 days control rat showing apical cytoplasm of the psoudostritified columnar epithelium projecting in to the glandular lumen (L) ,vesicle (V), Microvilli (mv), profile of endoplasmic reticulum (ER), secretary vacuoles (SV), Cisternae of endoplasmic reticulum. X6000.

Fig 5- Electron micrograph of the ventral prostate of the 60 days control rat showing apical region of the columnar epithelial cells with lumen (L). Note the tiny microvilli of epithelial cell (mv) , Profile of endoplasmic lumen with flocculent material. X20,000.



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9 **10** **11**

Fig 6- Electron micrograph of the ventral prostate of the 60 days Sildenafil citrate treated rat showing apical region of columnar epithelial cells with reduction in the Lumen (L). The cell has drastically reduced their size, with reduction in size and number of microvilli (mv). Note cell to cell tight junction with profile of endoplasmic reticulum (ER) scattered in it , secretary vesicle (SV), mitochondria (m). Overall the cells indicate the suppression in activity with reduction in width of the lumen. X6000.

Fig 7- High power of electron micrograph of the ventral prostate of 60 days Sildenafil citrate treated rat showing the epithelial atrophy , rough endoplasmic reticulum changes to smooth endoplasmic reticulum . The cell have lost their linear arrangement and are converted in to the single mass and changing their size. Note hypertrophied mitochondria (m) with loss of internal cristae . Also note the secretary vacuoles (SV) and profile of endoplasmic reticulum (ER) dense bodies (d) , junctional complex (jc). X20,000.

Fig 8- High power of electron micrograph of the ventral prostate of 60 days Sildenafil citrate treated rat showing irregular nucleus (N) with heterochromatin margination . Note the hypertrophied mitochondria (m) secretary vacuoles (sv) shows overall atrophied picture with scattered cellular profile. Note general disorganization of granular endoplasmic reticulum (ER). X 15000.

Fig 9- High power of electron micrograph of the ventral prostate of 60 days Sildenafil citrate treated rat showing proximal part of epithelial cell projecting lumen (L). Note tiny microvilli (mv) changes to elongated microvilli of epithelial cell. Other organelles responsible for formation secretary vacuoles (SV) with hypertrophy mitochondria (m), dark bodies (d) . Collaps endoplasmic reticulum in preparation for the formation of autophasic vacuoles free ribosomes appear to be enclosed by the membrane of autophasic vacuoles. X 15000.

Fig 10-11 –Epithelial cells rest and show considerable thickening .Note the basal cell(BC) 3000X Orientation of Nucleus (N) ,several Mitochondria (M)X12000.

RESULTS AND DISCUSSION

The Experimentally measured value of ultrasonic The prostate is an important accessory sex organ. The prostatic marphogenesis and epithelial growth are found to be dependent upon a mesenchymal interaction, which in androgen dependent [5,6]. The epithelial hypertrophy with hyperplasia indicate the over secretion of prostate can lead to destruction of cellular organelles as a important target of androgen stimulation which involved in epithelial proliferation5. Further it is suggested that the increase in blood flow in the reproductive structure due to Sildenafil citrate may have over stimulated. The prostatic cells under physiological condition. Present study , the weight of the ventral prostate after the 60 days treatment of Sildenafil citrate registered increased . The sildenafil citrate treatment induces a cytological effect after the treatment as evidence by cellular hypertrophy of the glandular element resulting in an increased mitotic activity following by increased glandular secretion and increase in the muscular tissue ,thus giving the gland a greater density and a weight increase[7,8]. The ultrastructure of the ventral prostate reveled normal columnar epithelium in the control rat, which was not reduced to a cubical or squamous shaped cells. Sildenafil citrate treatment ,there was a prominent reduction of rough endoplasmic reticulum which otherwise occurs in parallel arrays and occupies much of the cytoplasmic as it the seat of the protein synthesis .The synthesis and the release of the protein in the prostate is the same in the case of seminal vesicles [9,10]. The prostatic nuclei retain their cytosol receptors only after the receptor protein interacts and binds with DTH [11,12]. In high power magnification orientation of nuclei observed treatment of 60 days Sildenafil citrate .

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