

SUMMARY

The fundamental aim of this investigation is to elucidate the histological and the electron microscopical structure of four types of hypophyseal cells including folliculotrophs, luteotrophs, lactotrophs and thyrotrophs and their relation to the histomorphological and electron microscopical changes in the corresponding ovaries and endometrium.

Our study has been carried out on seventy eight female albino rats (*Rattus norvegicus albinos*) classified into three ages; immature, mature and senile ages. The mature rats subdivided into five groups according to different phases of estrous cycle that is to say early proestrus, late proestrus, estrus, metestrus and diestrus. The collected specimens (pars distalis, ovaries & uteri) were embedded in paraffin, serially and stepserially sectioned at 4-6 micrometers thick, then stained with different histological and histochemical dyes to be prepared for light microscopical examination. Some specimens were, also, treated to be examined by electron microscope.

The pars distalis was surrounded by a thin delicate fibrous capsule and contained fine interstitial tissue in immature ages. They were increased in thickness and density with advancing ages. Folliculotrophs couldn't be differentiated from luteotrophs up to 2nd week of neonatal rats. They were stained similarly. The cells were located peripherally in a small- sized PAS +ve area (sex zone) which became enlarged with advanced age. The differentiation was noticed at 22-days-old rat. As the folliculotrophs were polymorphic in shape and contained numerous polymorphic secretory granules stained purplish – violet, the luteotrophs were PAS+ ve oval or irregular cells containing uniform secretory

granules. Lactotrophs were easily to be identified at 22-day -old rat. They appeared in different forms with an orangeophilic cytoplasm containing few, coarse and polymorphic secretory granules. The few pale bluish thyrotrophs were noticed at 7-day-old rats .They were increased with advanced ages and appeared angular in shape with a deeply bluish cytoplasm.

The ovary at 7- day - old rats were covered by simple cuboidal epithelium with stratifications in some areas and housing naked- oocytes. With advanced ages, the surface epithelium was changed to simple squamous and the parenchyma was composed of numerous primordial polyovular follicles. With advanced ages, numerous primary and secondary follicles were located more centrally. No coropora lutea were seen till the 3rd week. The ovarian stroma appeared as epithelioid cells at 22-days- old rat containing lipid droplets ,mitochondria and RER.

At the first week, the uterine lumen was regular, smooth and lined with simple columnar epithelium showing some stratification. While at the 2nd week of life, epithelial invaginations as well as small –sized tubular were the fore-runners of endometrial glands. Further growth was recorded at the third week in the form of increase in thickness and the glands became highly folded and numerous.

During early proestrus, folliculotrophs were numerous and sparsely- granulated or degranulated with dilated cisternea of RER and filamentous mitochondria. While at late proestrus, they appeared in exhausted phase with clear cytoplasm. Strongly PAS+ve luteotrophs were present in early proestrus containing numerous electron – dense granules. While at late proestrus, some of luteotrophs were sparsely- granulated or degranulated. Most of lactotrophs in early proestrus were granulated and

contained few organelles while they became sparsely granulated and degranulated with well- developed organelles in late proestrus

The ovary during early proestrus showed different developmental stages of ovarian follicles. Mitotic divisions were seen in the granulosa cells. Also, regressed corpora lutea of previous cycle were seen. At late proestrus, mature ovarian follicles with large antra were present. Their granulosa cells contained lipid droplets and well- developed organelles.

The uterine surface epithelium in early proestrus was formed of high columnar cells showing mitotic activity. The endometrial glands were lined with low columnar cells containing PAS+ve granules. At late proestrus, progressive increase in the height of the columnar cells of both surface and glandular epithelium occurred as well as PAS+ve secretory material appeared in their lumina. The endometrial stroma was loose, highly oedematous and showed congested blood vessels.

During estrus phase, folliculotrophs were regranulated and few well-developed organelles were present. Most of luteotrophs were sparsely-granulated and their cytoplasm had few secretory granules, dilated cisterna of RER and intra cisternal granules. Some of lactotrophs were granulated and others sparsely- granulated. Thyrotrophs were active and sparsely- granulated in both pro- and estrous phases.

Recently formed corpora lutea with central lumina containing clotted blood were present in the ovary during the estrus phase beside many antral atretic follicles and old regressed corpora lutea.

During the estrus phase, marked decrease in the height of the surface and glandular epithelia of the uteri were seen. In addition, acidophilic

secretory material mixed with desquamated and inflammatory cells were present in their lumina.

In luteal phase, folliculotrophs were heavily granulated and most of cytoplasmic organelles were ill- observed. On the other hand, luteotrophs were hypertrophied, sparsely- granulated and had well- developed organelles. No histological changes were observed in lactotrophs. Thyrotrophs became few in number and regranulated.

The ovary in luteal phase showed well- developed corpora lutea. Their granulosa luteocytes contained lipid droplets and well- developed organelles.

The columnar cells of the uterine epithelium carried few, short microvilli and their cytoplasm contained lipid droplets which increased in diestrus. In addition, further deep down growths of endometrial glands were seen. They became highly coiled and branched in diestrus.

In senile ages, most of secretory cells of the pars distalis became further fewer, smaller and showed degenerative changes.

The ovary of 1.5 years- old rat were decreased in size and the interstitial tissue was increased on the expense of the ovarian follicles. While at 2 years - old many atretic follicles and ovarian cysts were present with disappearance of corpora lutea.

The uterine lumen in senile rats became slightly regular and smooth. Few, tubular, small- sized endometrial glands were scattered in the highly fibrous stroma.