COMPARATIVE STUDIES ON MICROSCOPIC MORPHOLOGY OF THE SEMINIFEROUS TUBULES IN 120-180 DAYS OLD COCKS

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ABSTRACT

At the age of 120 days in the seminal epithelium are present all types of cells of the seminal line - primary spermatocites, secondary spermatocites, spermatide and spermatozoa, that indicating onset of spermatogenesis process. Sertoli cells were observed in cross sections of seminiferous tubules, they are willing unistratal, with the nuclei located basal, polymorphous nucleolus sometimes triangular course.
There are many cells in semen Sertoli epithelium, in peritubulary are located myofibroblastes.
At cocks 180 days in seminal epithelium are present all cell types of the seminal line. Basement membrane of the seminiferous tubules is evident and intertubular connective tissue is PAS positive.

Key words: *seminiferous tubules, gonocytes, Sertoli cells, interstitial gland.*

INTRODUCTION

At the age of 120 days it observe a quantitative reduction of intertubular.
Interstitial endocrinocytes have different size, some are fusiforme, others have cytoplasm vacuolar, being involved in hormonegenesis.
At the age of 180 days in sections stained by Unna-Tanzer method interstitial gland appears in intertubular tissue, bounded by elastic fibers from basal lamina of the seminiferous tubules. Leydig cells are either isolated, disseminated ,or in groups, with blood vessels and connective tissue.
Sertoli cells are active from mitotic point of view and contain large amounts of rough endoplasmic reticulum and produce antiparamesonephrotic hormone.

As spermatogonia, Sertoli cells are among the most resistant cells and germinal epithelium remain predominant cell type in aging gonads.

MATERIAL AND METHODS

The researches were conducted on testes harvested from cock, race-variety white Leghorn, normally developed, clinically healthy, vaccinated, macroscopically and microscopically examined.
The inspection of histological preparations were made on permanent histology, processed by usual histological techniques and colored by Tanzer-Unna and P.A.S histochemical techniques. Were performed electronmicroscopically studies of seminal epithelium, morphometric measurements of the outside diameter of the seminiferous tubules, the seminiferous tubules lumen diameter and epithelium height of 120 and 180 days cocks.

RESULTS AND DISCUSSION

At the specimens from the age of 120 days in the seminal epithelium are present all types of cells of the seminal line - primary spermatocites, secondary spermatocites, spermatide and spermatozoa, that indicating onset of spermatogenesis process. Sertoli cells were observed in cross sections of seminiferous tubules, they are willing unistratal, with the nuclei located basal, polymorphous nucleolus sometimes triangular course.
There are many cells in semen Sertoli epithelium, in peritubulary are located myofibroblastes.
Seminal epithelium is placed on a thick basement membrane, composed of lamina lucid , electronodense with thickness by 10 nanometers, homogeneous and crossed by fine filaments rare; a lamina thickness of 20-30 nanometers thick, composed by filaments fines abundants, contained in an amorphous matrix, dense and a lamina reticulata which pass to the connective tissue matrix.
Basement membrane has many identary or invagination in the seminiferous epithelium, directed mainly by Sertoli cells and contains numerous electron-light granules.
Is placed on a miofibrilar layer homogeneous devoid of collagen fiber.

Is apparent basement membrane is apparent of the seminiferous tube, quite thick, being placed above the seminal epithelium, composed of cells Sertoli and seminal cells line.
Sertoli cell has a nucleus composed of large coarse chromatin. In his cytoplasm are numerous mitochondria and rough endoplasmic reticulum.

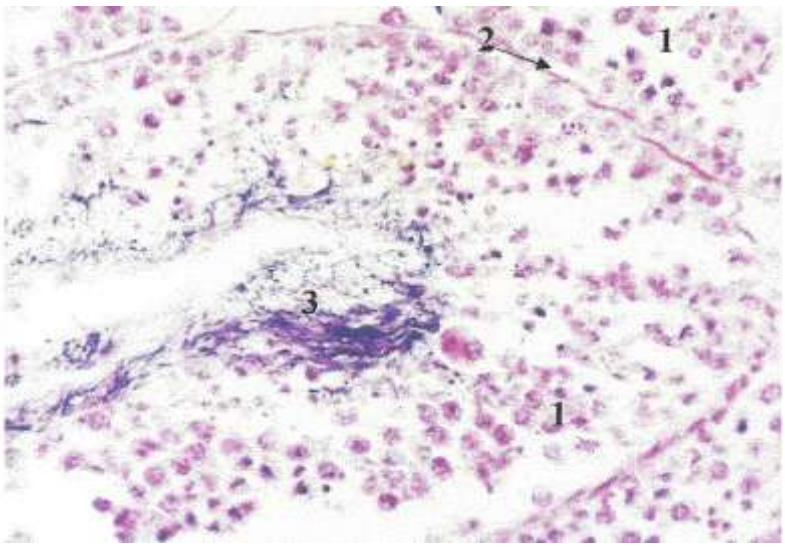

Fig.1- Cock testicle 120 days ;PAS Stain Ob.10X1- lumen of the seminiferous tubules;1- seminal epithelium2- basement membrane; 3-sperm tails

Sertoli cells are active from mitotic point of view and contain large amounts of rough endoplasmic reticulum and produce antiparamesonephrotic hormone. As spermatogonia, Sertoli cells are among the most resistant cells and germinal epithelium remain predominant cell type in aging gonads. Spermatogonia A has an ovoid nucleus with prominent nucleoli and has a large area of contact with the basal lamina.
Type B spermatogonia is a spherical cell with spherical nucleus and nucleolus less prominent. Of mitotic division of spermatogonia B are form the primary spermatocytes.The research on electron microscopy of the testicular parenchyma, from the cocks, I highlighted some outstanding tissues, unreported in the specialty literature.

THE OUTER DIAMETER OF SEMINIFEROUS TUBULES, LUMEN DIAMETER AND EPITHELIUM HEIGHT AT 120 DAYS

Seminiferous tubules	Outer diameter(μm)	Lumen diameter(μm)	Epithelium height (μm)
1	218,182	83,417	67,520
2	2115,342	78,979	68,177
3	168,521	95,750	36,385
4	169,234	71,417	48,572
5	191,917	95,500	47,208
6	187,358	100,458	43,229
7	217,398	145,937	66,396
8	318,687	148,104	84,791
9	158,958	80,062	38,395
10	270,687	146,896	62,448
Average	**217,287**	**104,352**	**56,912**

At the age of 180 days in sections stained by Unna-Tanzer method gland intertubular interstitial tissue occurs, bounded by elastic fibers from the basal lamina of the seminiferous tubules. Leydig cells are either isolated disseminated or in groups, with blood vessels and connective tissue.
At this age in sections stained by the method of Unna-Tanzer elastic fibers appear in the basal membrane of the seminiferous tubules. On the basal membrane is placed stratified epithelium with a settlement seminal feature columns, on top of the columns being placed late spermatids and sperm.
Spermatogonia A have ovoid with a nucleus and nucleolus proieminenţi has a large area of contact with the basal lamina. Type B spermatogonia is a spherical cell with spherical nucleus and nucleolus less proieminent. Mitotic division of spermatogonia to primary spermatocytes B is formed. These are the largest cells of the seminal line located in an intermediate position between spermatogonia and spermatida, are large and round nuclei with conspicuous nucleoli. They gradually lose contact with the basal lamina and moving adluminal compartment through intercellular junctions of Sertoli cells.

Through spermiogenesis the newly formed spermatids differ in sperm. Excess material of spermatids (cytoplasm, water, organelles) unnecessary to sperm resulting from morphological changes during spermiogenesis (after acrosome formation, nuclear chromatin condensation), is phagocytied by Sertoli cells.

At cocks spermatogenesis is four times faster than mammals and are produced four times the number of sperm/g by testicle than in mammals and this difference is associated with a more active transit and reduced survival of sperm in male extratesticular channels at birds than in mammals.

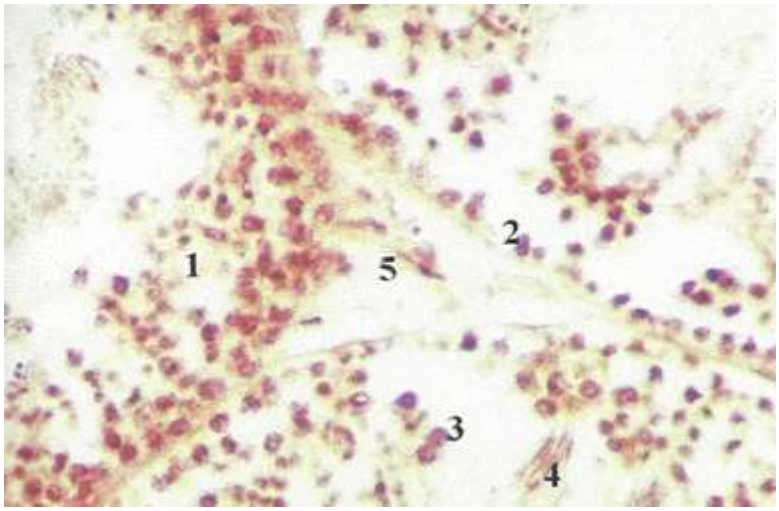

Fig.2- Cock testicle 180 days;Tanzer-Unna Stain Ob.40X
1- seminal epithelium;2- spermatogonia; 3- primary spermatocite;
4- flagelii sperm;5- interstitial gland;

From the age of 180 days in seminal epithelium are present all cell types of the seminal line. Basement membrane of the seminiferous tubules is evident and intertubular connective tissue is PAS positive.

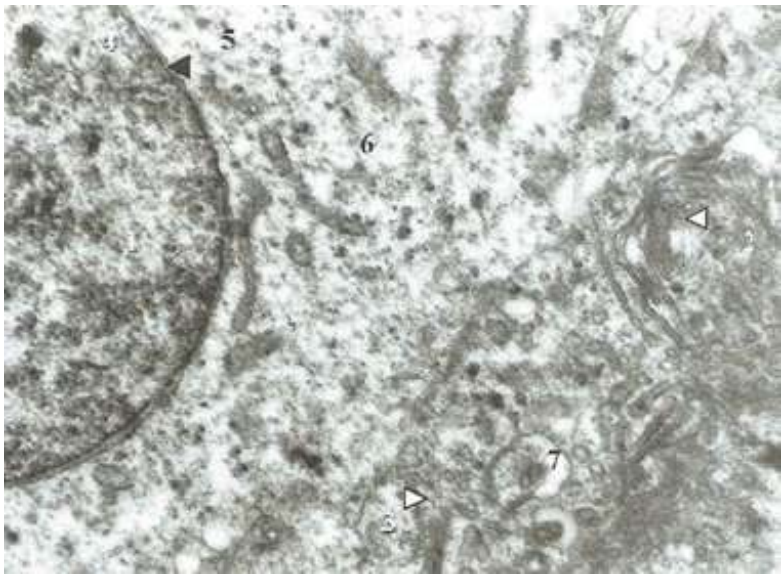

Fig.3 Seminal epithelium – ultrastructure (X 22.000)
1-spermatocit of I;2-Golgi complex;3-ribosomes;4 –nucleolus;5 -nuclear membrane;6-endoplasmic reticulum rough;7-lysosomes

THE OUTER DIAMETER OF SEMINIFEROUS TUBULES, LUMEN DIAMETER AND EPITHELIUM HEIGHT AT 180 DAYS

Seminiferous tubules	Outer diameter(μm)	Lumen diameter(μm)	Epithelim height (μm)
1	377,500	260,000	58,750
2	327,500	200,000	63,750
3	310,000	187,000	61,500
4	382,500	275,500	52,500
5	547,534	160,500	51,250
6	312,432	315,000	76,000
7	400.132	272,500	42,500
8	355,374	195,000	41,250
9	330,000	100,500	67,500
10	297,000	221,300	98,250

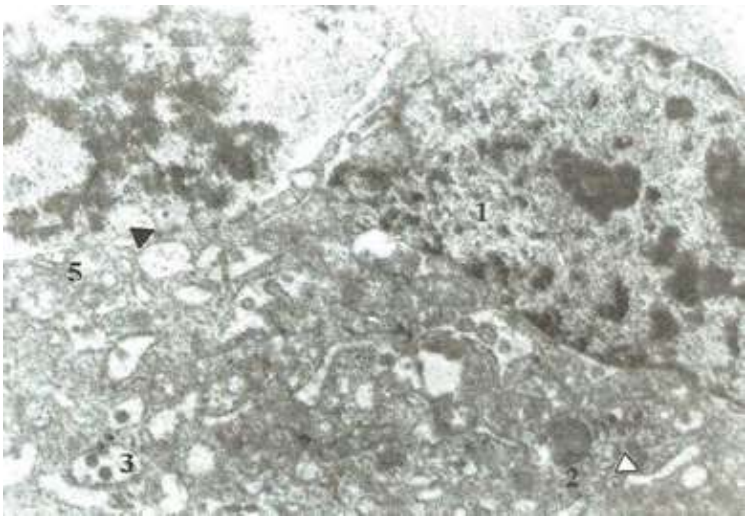

Fig.4 Sertoli cell(x16.500) 1-Sertoli cell nucleus,2-endoplasmic reticulum smooth,3-lysosomes 4-spermatocit,5-desmozomi

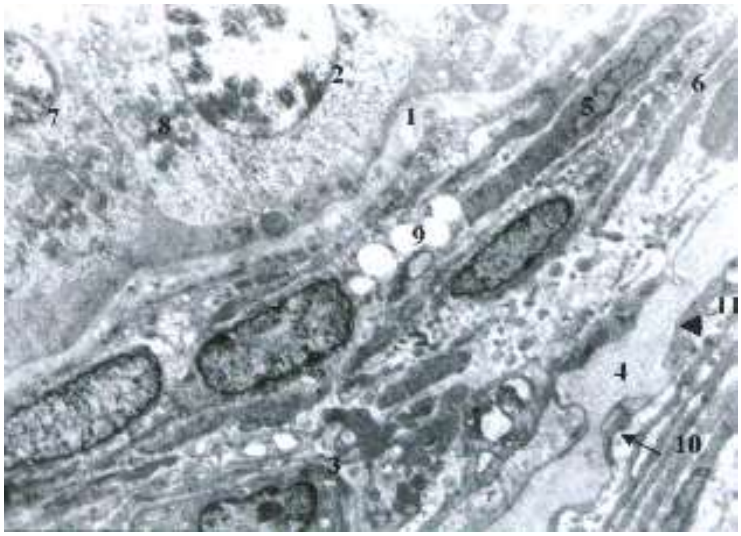

Fig.5 Seminal epithelium – ultrastructure (X 22.000)basement membrane; 2- Sertoli cell; 3-Leydig cell;4- capillary blood; 5- fibroblast; 6- collagen fibres; 7-spermatogonium; 8-mitochondria 9-REN; 10-the capillary basement membrane; 11-edoteliate cells

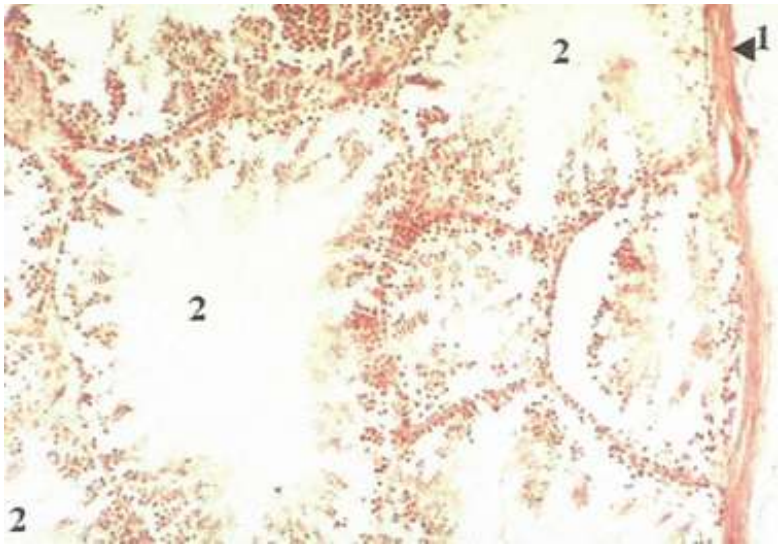

Fig.6- Cock testicle 180 days;Tanzer-Unna Stain Ob.40X
1- Albugineea;2- seminiferous tubules

CONCLUSIONS

At the age of 120 days in the seminal epithelium are present all types of cells of the seminal line - primary spermatocites, secondary spermatocites, spermatide and sperm, that indicating onset of spermatogenesis process. Sertoli cells were observed in cross sections of seminiferous tubules, they are willing unistratal, with the nuclei located basal, polymorphous nucleolus sometimes triangular course.Sertoli cell is located on the basement membrane of seminiferous tube that makes complex jonctionale.

At the age of 120 days the interstitial Leyding gland appears in intertubular tissue, delimited by the elastic fibers from the basal lamina of seminiferous tubules.

It is noted that the basement membrane of seminiferous tube is thick and shows numerous invagination directed to the cytoplasm of the Sertoli cells.

The cytoplasm of the Sertoli cell is dense and has more organites numerous cistern of smooth endoplasmatic reticulum, numerous mitochondria, rough endoplasmic reticulum profiles, lysosomal, Golgi complex, centrioli, etc. Gonocites transformation in spermatogonia is accompanied by a spray of color mass that from granular form switch to powder.

At the age of 180 days spermatogonia located at the periphery of the seminiferous epithelium are basal arranged on a single line and are spaced between them.
Are round or polyhedral cells with dark nucleus, coarse-looking occupying the center of the cell. Sometimes it is polymorphic, being division. Less abundant cytoplasm is basophilic.
These are the largest cells of the seminal line located in an intermediate position between spermatogonia and spermatida, their nucleus are large and round, with obvious nucleolus.
They gradually lose contact with the basal lamina and moving adluminal compartment through intercellular junctions of Sertoli cells.
Size increases progressively seminiferous tubules and intertubular space is reduced proportionally with increasing age, the lowest being observed at 180 days.

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