MORPHOLOGICAL CONSIDERATIONS REGARDING PIG TESTICULAR DEVELOPMENT DURING THE FIRST UNTIL THE SIXTH MONTH OF LIFE

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Summary

The aim of this study was to follow the evolution and development in dynamic of the endocrine and exocrine component of boar testicle during the first until the sixth month of life. Testicle and epidimus fragments collected from males of two weeks, two, four and respectively six months of age were fastened in Stieve mix, included in paraffin and sectioned at 6 µm, stained tricromic modified by Goldner and ferical haematoxylin Heidenheim methods. During the studied period at the testicular level a continuous proliferation both at the endocrine and exocrine component is observed. The transformation of the seminal cords in tubes and numerous mitoses are also revealed. The endocrine component is good represented on the studied period.

Key words: pig, testicle, morphology, exocrine, endocrine

Introduction

The literature data is rich in data regarding spermatogenesis in general and particularly its course related to the way of life of various mammals. Data concerning genital male system embryology from the constitution of the primordial germinal cells to bring forth is also frequently mentioned. Is interested the moment of the apparition and the evolution until bring forth of both testicular components: exocrine and endocrine (Adlerrsberg et al., 1995; Dumitru et al., 1977).

The period among bring forth and puberty is not as well covered with information, few in number and mostly obscurely or contradictory. The existing data are referring to human and species easier to be investigating such as mouse and rat (Aughey and Frye, 2001).

The aim of this study was to follow the evolution and development in dynamic of the endocrine and exocrine component of boar testicle during the first until the sixth month of life.

Material and methods

Testicle and epidimus fragments collected from males of two weeks, two, four and respectively six months of age were fastened in Stieve mix, included in paraffin and sectioned at 6 µm, stained tricromic modified by Goldner and ferical haematoxylin Heidenheim methods.

Results and discussion

At two weeks, pig testicle is covered with an abundantly albuginea having a dense aspect on the internal part, with relatively lax structure and many blood vessels. The organ is lobate by delicate conjunctive septum. Seminal cordons have sinuous aspect but less pronounced compared to adult animals suggesting that their length is much shorter than in adults.

At the exocrine component level, represented by complete seminipher cordons covered with apparently stratified epithelium with two type of cells (fig. 1), a smaller type with round or oval nucleus,
one or two nucleoli with fine granular chromatin situated towards the basal membrane and the second type, larger, with big nucleus and pulverulent chromatin placed towards the centre of the cordons.

The interstitial gland is highly developed composed mostly of long cellular cordons at the level of the interlobulary septum and short cordons ramified between the seminal cordons. The endocrine component is very developed representing more than 50% of the organ structure (fig.2).

The vascularization is highly represented of small calibre vessels placed both around the seminal cordons and in contact with the endocrine cells.

The spermatogenetic activity is absent for both at the testicular network and epididimary channel spermatozoids were not present.

Ferical haematoxylin Heidenheim staining revealed at the seminal cordons level cells in division (fig.3), demonstrating a proliferate activity involving the replace of the aged cells or seminal cordons growth in length. These divisions have no connection to the spermatogenesis process. Divisions in small number were observed at the endocrine component level. Ferical haematoxylin Heidenheim staining is revealing the presence of numerous granules in the endocrine cells cytoplasm suggesting an intense secretor activity.

At two months organ general aspect is comparable to the aspect at two months. The internal albuginea area is denser than at two weeks and it contains many blood vessels of various dimensions. Regarding the proportion between the exocrine and endocrine component he is maintained and appreciatively of 1:1. The exocrine component is represented by the seminal cordons (fig. 4).

The number of the big cells observed at the pig of two weeks old is increased here, almost doubled with cells in the division process. Two types of cells are observed, one type placed on the basal membrane predominant, and the second type, of big size, mostly placed towards the middle of the cordons compared to the first type.
The vascularization inside the testicular lobules is well represented compared to the situation at the two weeks old pig.

Fig. 4 Seminal cordons with two types of cells (Tricrom Goldner, ob. 40X)

The aspect of the interstitial gland is maintained, composed of long parallel cordons at the level of the septum separating the testicular lobules; short and ramified cordons between the seminifer cordons. The spermatogenetic activity is absent, spermatozoids were not observed at the testicular network and the epididim level. Here, the epithelium that covers the tubes is tall but stereo-flagella are short and rare.

Ferical haematoxylin Heidenheim staining reveals divisions that in number are even reduced than in two weeks old pig (fig.5).

Fig. 5 Seminal cordons with cells in division (Ferical haematoxylin Heidenheim, ob. 40X)

In the cytoplasms of the endocrine cells exist secretion granules observed at two weeks old pig but the secretor activity is at a lower level.

At four months, both components are good represented but the exocrine component is occupying two thirds while the endocrine just one (fig. 6).

The exocrine component is represented by tubular formations having relatively small lumen and the while the seminal epithelium cells are placed on many layers. Big size cells observed previously are also present but their number is significantly smaller. The number of the cells in division is much increased.

Fig. 6 Proportion of aproximately 2:1 between the components (Tricrom Goldner, ob. 10X)

The diameter of the tubes is larger than the cordons in previous cases, probably due to the proliferation of the cells here placed on many layers similar to the aspect observed at the adult’s testicle.

The endocrine component is good represented here too, with long cellular approximately parallel cordons but also ramified cordons placed between the seminal tubes.

At the level of the epididim channel the epithelium taller, pseudo stratified with stereo-flagella of number and dimension compared to adult animals. Most of the tubes contain small quantities of material with reticular aspect and low tinctorial affinity with no spermatozoids of typical structure in the studied channels.
Ferical haematoxylin Heidenheim staining reveals an increased number of divisions compared to previous cases, but their number is not comparable in all the tubes. The tubes presenting many divisions have the lumen well constituted while tubes with small division number have the lumen very thigh or absent (fig. 7).

The presented divisions are not finalized with spermatozoid formation and are probably necessary for the population of the tubes with cells able to continue the spermatogenesis process after puberty.

At six months the proportion is favorable to the exocrine component but the endocrine component is also good represented.

The endocrine component is composed of tubular formations – seminal tubes with the wall formed of stratified epithelium as in adults. Numerous divisions are present mostly at this age connected to the spermatogenesis process. In the lumen of some tubes spermatozoids are observed. At this age the spermatogenesis process is initiated but with low intensity (fig. 8). Spermatozoids can be observed at the epididim level too.

Conclusions
1. The exocrine component of the prepuber testicle is represented by filled seminal cords with lumen appearing before puberty when they turn in to seminifer tubes.
2. The entire period from birth to puberty has proliferation activity assuring both length and thickness growth of the seminal cords.
3. The endocrine component in pig is developed from the first month of life to puberty but does not disappear at a moment as mentioned in the literature data.

References