Histomorphometry of Golden Hamster Ovaries

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Article info:
Received: 07 Aug 2013
Accepted: 16 Dec 2013

ABSTRACT

Introduction: Genital system is important herd in animal's creation. It is necessary for animal reproduction. Mammal has two sex in genital system such as male and female in separated animals. Animal reproduction destroyed by disorder of genital system. In this case, animals cannot produce an animal similar to them. Finally it cause overthrow a species of animals.

Methods: Histomorphologic characteristic of hamster ovary studied in this research for a human model. 5 right and 5 left ovary of puberty hamster is studied. Studied biometric parameters were length, wildness and thickness.

Results: This research results showed which right hamster ovary had 5/08±1/6mm in length, 3/05 ± 0/56 mm in wide ,and 2/88 ± 0/327 mm in diameter and left ovary had 4/68 ± 1/253 mm in length, 2/2 ± 0/703 mm in wide and 2/4 ± 0/609 mm in diameter. Countering of different type of hamster ovarian follicles were showed which number of primordial follicles were 1628/33± 305/6049, number of primary follicles were 307/33 ± 56/76, number of secondary follicles were 140 ± 60/63, number of tertiary follicles were 9± 0 and number of graafian follicles were 8 ± 3/6. Total count of hamster ovarian follicles was 2192/66± 178/46. Histological studies showed which covering epithelium, parenchyma of hamster ovary is similar to another mammal, and zuna plucida is forming in primary follicles when two cuboidal cell layers are observed around oocytes.

Conclusion: Finally, because hamsters has short living period in comparing to human, therefore they have low ovarian follicles and oocytes but hamster ovarian follicles and oocyte were similar to human follicles and oocyte in histologic characteristics.

Key Words:
Embryology,
Female Genital System,
Hamster,
Histology.

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1. Introduction

Reproduction is a biological occurrence which exhibits a regular recurrence of pattern of activities in a cyclic manner [7]. Rodents comprise the largest and diverse group of mammals, with 1700 different species [2]. Hamster is one of the best established experimental animals and probably among the best popular pets in the western world. The entire laboratory and pet population of hamster originated from a single brother-sister pairing back in 1930. With the acceptation of a single outbreed stock which derived from 12 wild animals brought to the USA in 1971 [1, 9].

Folliculogenesis begins with the recruitment of a primordial follicle into the pool of growing follicles and ends with either ovulation or death by atresia. Folliculogenesis can be divided into two phases. The first phase, known as the prenatal or gonadotropin-independent phase, is characterized by the growth and differentiation of the oocyte. The second, known as the natal or gonadotropin-dependent phase, is characterized by the tremendous increase of the size of the follicle itself. Structure and population of ovarian follicles and oocytes are very important for evaluation of fertility ability in mammals [3, 6, 11, 12].

Number of total count of ovarian follicles depends on the length of female reproductive life approximately. Females have long sexual life; therefore, they have about 300,000 oocytes in each ovary [7]. Number of primordial follicles was reported 2,500 in the mouse, 10,500 in the cattle, and 21,000 in the sow, respectively [12]. The entire oocytes can not be ovulated in reproductive life of a female; therefore, most of the oocytes are degenerating through atresia process [7]. In each sexual cycle, one or more follicles are beginning to growing but one oocyte is ovulated in monopoly birth animals and tow or more oocytes are ovulated in multiple birth animals [4, 7]. Although numerous papers have been published on the structure of rodent ovaries and other mammals [2, 6, 11, 12, 14, 15], but we studied histomorphometry of golden hamster in Iran. The results of this study can be used for future studies on hamster as laboratory animals or production hamster as pet animals.

2. Materials and Methods

The appropriate ethics committee approval was obtained for using animals' ovarian tissues in this study. Five non-parturient female mature hamsters (about 100 g weight) were selected and euthanized by ether under animal right condition. Then, abdominal cavity was opened and ovaries were removed. First, length, width, and thickness of ovaries were measured by Vernier. Then, ovaries were fixed by 10% formalin. Samples were processed by routine histological methods by autotechnicon (JUNG HISTOKINET 2000 Leica). Paraffin ovarian blocks were sectioned as serial section with 7 µm thickness. The sections were stained by Hematoxylin & Eosin and PAS staining method. The obtained ovaries tissue slides were studied by light fluorescent

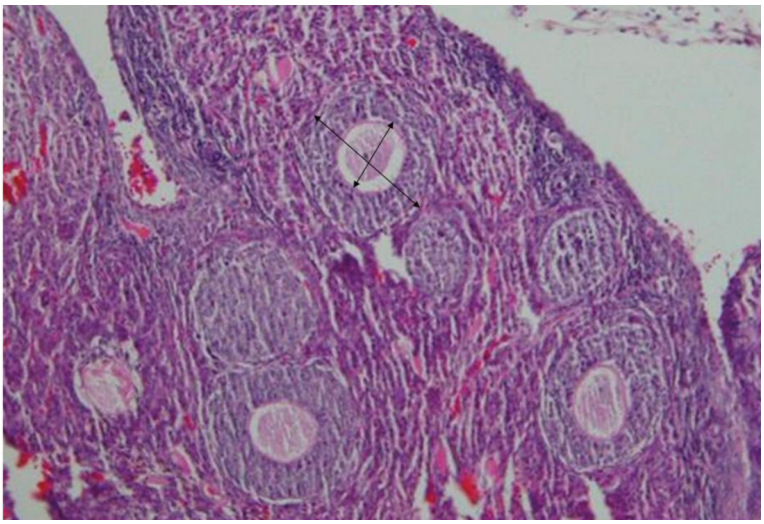

Figure 1. Ovary of hamster. Larger arrow is showing size of late secondary follicle and smaller arrow is showing size of oocyte.