Folliculogenesis in Polycystic Ovaries in the Domestic Cat

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Abstract

Polycystic ovary syndrome (PCOS) is the most common cause of anovulatory infertility, but the mechanism of anovulation remains uncertain. The typical gross morphology of anovulatory polycystic ovaries is the presence of multiple antral follicles 2–10 mm in diameter, which signifies the arrest of follicle development prior to the preovulatory phase. Anovulation in PCOS is characterized by arrested growth of antral follicles. Although arrested antral follicle growth reflects the abnormal endocrine environment, there is increasing evidence of abnormalities of follicle development from the very earliest, gonadotropin-independent stages. The underlying molecular basis of this fundamental ovarian abnormality remains to be determined.

Folliculogenesis is the cycle of maturation of a follicle within the ovary of the adult human female. A follicle is a membranous sac of cells that contains an immature egg cell, called an oocyte. The primary investigation of this research includes a study identifying various stages of follicle development with particular reference to antral follicle development and their respective sizes during the estrous cycle of the domestic cat, *Felis catus.* This understanding will help enhance the ability to assess risk and develop preventative strategies of ovarian dysfunction such as Polycystic Ovarian Syndrome, as highlighted. Ovaries from adult female domestic cats were obtained from routine spaying procedures conducted at a local veterinary clinic. The primary methods utilized in the study include histology of the ovarian tissue. Briefly, ovaries were surgically removed during a spaying procedure at a veterinary clinic and washed in PBS. Ovarian tissue was fixed in formalin solution, followed by rinsing in a graded ethanol series (70%, 95%, 100%). Tissues were then embedded in paraffin, serially sectioned (5 μm), mounted onto microscope slides, and stained with hematoxylin and eosin by a standard histological procedure. Gross follicular morphology, including their respective sizes, was evaluated for various developmental stages of the ovarian follicles.

Key words: Ovary, Follicles, Ovulation, Folliculogenesis, Antrum