The corpus luteum, a transient endocrine gland, secretes progesterone as the principal steroid hormone, formed from the wall of the Graafian follicle after the release of the egg. It shows variation in size, structure and steroidogenic activities during different stages of the estrous cycle and pregnancy (Fields and Fields, 1996). It consists of two types of cells viz. granulosa lutein and theca lutein cells. The present work was conducted to study the distribution and histochemical characters of corpus luteum in buffaloes during different seasons in relation to the ovulation.

MATERIALS AND METHODS

The study was conducted on left and right ovaries of 100 adult buffaloes collected from slaughter house during different seasons (20 in each season) of year viz; winter (November-January), spring (February-March), summer (April-June), rainy (July-August) and autumn (September-October). Immediately after collection, the ovaries were washed with normal saline solution and tissue around the ovaries was removed. The tissues fixed in 10% neutral buffered formalin were processed by acetone benzene schedule (Luna, 1968). The paraffin blocks of entire ovary were prepared and sectioned at a thickness of 5 µ. Sections were stained with hematoxylin and eosin, Masson’s trichrome, Gridley’s silver impregnation stain, Verhoeff’s hematoxylin, periodic acid Schiff’s reaction, Alcian blue and bromphenol blue (Luna, 1968). Cryostat sections of fresh ovarian tissue were stained with Sudan black B for demonstration of total lipids.

RESULTS AND DISCUSSION

The ovarian surface presented corpora lutea of different sizes and consistency. Some portions of these were found protruding on the surface, while major portion was embedded within the ovary as already described by Fadle et al. (1974) and Bansal (2002) in buffalo ovaries. As the wall of mature follicle ruptured, the remaining follicle collapsed and got shrunken with folded wall of granulosa cells. Theca cells were not seen as the theca layer of the collapsed follicle did not reach the surface of the ovary. After the ovulation, the granulosa and theca cells started forming luteal cells. The corpus luteum was surrounded by compact connective tissue from which incomplete connective tissue strands were seen radiating into the stroma. In fully formed corpus luteum, the luteal cells were of two types, viz. large and small (Fig. 1). The luteal cells were having large cytoplasm and vesicular nucleus. Fibrocytes, endothelial cells, erythrocytes, leucocytes and macrophages were also present as reported earlier by Singh (1994) and Bansal (2002). The corpus luteum was highly vascularized as large numbers of blood vessels were seen along the periphery and also within the stroma of corpus luteum.

In some of the corpora lutea, the luteal cells showed signs of degeneration. The luteal cells looked empty but cell boundaries could be seen. Nuclei were small, pyknotic and shrunken. These type of luteal cells presented regressing stages of corpora lutea. Later on, vacuolations indicating destroyed luteal cells and loss of nuclei were observed (Fig. 2). Large number of small...
arteries with thick wall were also observed as reported earlier by Danell (1987) in old corpus luteum of buffalo ovaries. The connective tissue invaginated and occupied entire corpora lutea, transforming it into corpus albicans. The remnants of corpora albicans could also be observed in some of the ovaries.

The study revealed that the distribution of neutral and acidic mucopolysaccharides, protein and lipid did not vary in different structures of ovary among seasons but the reaction was variable in ovarian tissue depending upon their physiological status. The connective tissue covering was moderate to strongly positive whereas, luteal cells showed moderate reaction for neutral mucopolysaccharides (Fig. 3). Both connective tissue covering and luteal cells showed moderate reaction for acidic mucopolysaccharides. The capsule of corpus luteum showed a moderate reaction for basic proteins whereas, luteal cells were weak to moderately positive. Connective tissue covering of corpus luteum showed weak to moderate reaction for lipids whereas, luteal cells especially the large ones were strongly positive (Fig. 4). The abundance of Sudanophilic lipid droplets has been reported in the luteal cells in buffalo (Ahmed et al., 1984). It has been suggested that such luteal cells actively function in the secretion of progesterone rather than in the storage of hormone precursor like cholesterol (Guraya, 1997).

REFERENCES


