Histochemical Studies on the Liver of Goat Foetii (*Capra hircus*)

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**ABSTRACT**

The present study was conducted on the liver of goat foetii at various prenatal ages. The hepatoblasts and hepatocytes showed mild reaction to glycogen below 50 days of gestation. The hepatic cells and the haemopoietic cells exhibited a weak reaction to acid mucopolysaccharides up to 100 days of foetal age, afterwards the reaction increased to moderate to strong. The megakaryocytes showed strong PAS reaction, while the haemopoietic cells showed intense reaction to neutral mucopolysaccharides. The hepatic cells were moderately reactive for basic proteins, while the haemopoietic cells were strongly reactive up to 100 days of gestation which intensified at advanced stages. The haemopoietic cells of the hepatic parenchyma up to 49 days of gestation showed marked deposition of haemosiderin pigments but its intensity diminished with advancing foetal age.

**Key words:** Goat foetii, Hepatic parenchyma, Histochemistry, Stroma

Studies on prenatal development of the liver has been conducted in goat (Mandal *et al.*, 2002). Paucity of literature on histochemical features of the prenatal liver in goats prompted this present study. non-descript Indian buffalo (Doley *et al.*, 2006). Gross morphological studies on the liver of goat have been already published; however these foetii of different age group were divided into different groups as described earlier (Singh *et al.*, 2013).

**MATERIALS AND METHODS**

Liver tissue samples were collected and fixed in 10% neutral buffered formalin solution and processed for paraffin block preparation by alcohol-benzene schedule (Luna, 1968). Tissue sections of 5-6 were stained with various stains viz. Prussian blue Stain for ferrous and ferric iron, best carmine method for glycogen, periodic acid Schiff’s method for neutral muco-polysaccharides (Luna, 1968), Alcian Blue at pH 2.5 for Acid Muco- Polysaccharides (Luna, 1968) and bromophenol blue for proteins (Pearse, 1972) to record the histochemical features of the liver of goat foetii.

**RESULTS AND DISCUSSION**

In the present study, at 39 and 41 days of gestation, (CRL= 3.20 and 3.30 cm), the hepatoblasts and hepatocytes showed mild reaction to glycogen. At 49 days of gestation, the hepatic cells showed moderate reaction for glycogen. In contrast, Mandal *et al.* (2002) stated that Best carmine positive glycogen granules were not observed in the cytoplasm of hepatoblasts till 60±3 days of gestation in goat. At 89 days of gestation, the hepatic parenchyma and the haemopoietic cells showed intense reaction to glycogen. Mandal *et al.* (2002) stated that the glycogen granules appeared in the hepatoblasts in moderate quantity in the age group of 75±3 days of gestation. At 148 days of gestation, a moderate to strong reaction for glycogen was seen in the parenchymal cells as well as the haemopoietic cells.

In the present study, at 45 days of gestation, the hepatic parenchyma showed moderate reaction to uniform PAS positive reaction. The megakaryocytes showed strong PAS reaction, while the haemopoietic cells showed intense reaction to neutral mucopolysaccharides. Similar, findings were reported in goat foetii (Mandal *et al.*, 2002; Kumar *et al.*, 2007). The basement membrane of the central veins showed intense PAS reaction. Ackerman and Knoff (1960) also stated that foetal pig liver showed strong reaction for PAS in endothelial linings of blood vessel. At 61 and 89 days of gestation, the hepatocytes and megakaryocytes were strongly PAS positive (Figs. 1, 2). However in buffalo foetii of similar gestational ages, there were found to be moderately positive for PAS (Doley *et al.*, 2006). At 134
and 148 days of gestation, the hepatocytes showed an intense PAS positive reaction (Fig. 3). Again the basement membrane of the central veins showed intense PAS positive reactions. Similarly, such strong PAS reaction in the hepatocytes and basement membranes were also reported in goat foetii during late gestation (Mandal et al., 2002).

At 41 days of gestation, the hepatic cells were moderately reactive for proteins and at 49 days of gestation, the hepatic cells exhibited a moderate to strong reaction to basic proteins (Fig. 4). As reported in buffalo foetii (Doley et al., 2006). Likewise at near full term (at 148 days of gestation), the hepatocytes showed a strong reaction to basic proteins.

Acid mucopolysaccharides: At 39 and at 45 days of gestation (CRL=3.30cm), the hepatic parenchyma showed a weak reaction to acid mucopolysaccharides. Doley et al. (2006) also reported that the Alcian blue reaction for acid mucopolysaccharides was moderate in this age group of buffalo foetii. At 51 days of gestation, the hepatic cells and the haemopoietic cells exhibited weak to moderate reaction to acid mucopolysaccharides. At 134 and 145 days of gestation, the hepatocytes exhibited a moderate reaction to acid mucopolysaccharides. In contrast, a strong reaction was observed by Doley et al. (2006) in buffalo foetii.

Haemosiderin pigment: In the present study, at early stages of gestation viz. at 39, 45 and 49 days of gestation, the haemopoietic cells of the hepatic parenchyma showed marked deposition of haemosiderin pigments. While the content diminished as the gestational age advanced and at 145 days of gestation (CRL=38.50cm), the haemopoietic cells containing haemosiderin pigment were scanty, indicating that haemopoietic function of the prenatal liver was more during early stages of pregnancy and it diminished during advanced stages in goat foetii as reported earlier in buffalo foetii (Doley et al., 2006).

REFERENCES


