Comparative Histochemical Studies on the Angioarchitecture of Coronary and Femoral Artery in Goat (Capra hircus)

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Received: 20 June 2014; Accepted: 07 July 2014

ABSTRACT

The present study was conducted on the coronary and femoral artery of 18 goats divided into three age groups viz. kid (up to 1 year), young (1-2 years) and adult (2 years and above) for recording the histochemical peculiarities at their origin, middle and termination points. The deposition of glycogen was limited to the tunica intima and adventitia of coronary and femoral artery with intense PAS activity was observed in kids and young in coronary artery whereas in kids and adults in the femoral artery, respectively. The deposition of lipids was found in all the tunics of the arteries, which showed an increased trend with the advancement of age in the animals. The deposition of calcium salts was only found in the tunica adventitia of proximal end of left femoral artery in adult animals. The acid and alkaline phosphatase activities were limited to the intima, adventitia and perivascular connective tissues of the coronary and femoral artery whereas intense activities were found in the femoral artery of kids.

Key words: Angioarchitecture, Coronary artery, Femoral artery, Goat, Histochemical

RESULTS AND DISCUSSION

The PAS activity was found in the tunica externa and intima of the coronary and femoral artery with the absence of activity in the media as observed by (Cook et al., 1977).

Moderate activities were recorded in the tunica externa and endothelium of the left coronary artery at the origin in young, while very weak activities were observed in the kid and adult animals. The left coronary artery at the middle was found to have weak PAS activity in kids and young animals, but moderate activity was noted in the adult animals. Moderate PAS activity was recorded in the left coronary artery at the termination in all the age groups of
goats, while at the origin of the right coronary artery very weak PAS activity was found. Weak to moderate activity was observed in the right coronary artery at the middle in young. In contrast, moderate activity was recorded in the tunica externa of the right coronary artery at the middle in kids with the endothelium showing intense PAS reaction, whereas in adult goats weak activity was observed. In young, intense activity was found in the endothelium of right coronary artery at the termination with weak activity in the externa, whereas the kid and adult animals showed weak PAS activity in endothelium and externa.

In kids, intense activity was recorded in the endothelium of left and right femoral artery at proximal end, whereas weak activity was observed in the tunica adventitia. The media showed no PAS activity in both the femoral arteries. The present observations were in contrary with those reported by Vaish et al. (2003). Very weak activity was observed in the endothelium and adventitia of the left femoral artery at the middle and distal end. In young, moderate activity was noted in the adventitia with the endothelium showing very weak activity in the left femoral artery at the middle and the right femoral artery at the proximal end (Fig. 1). Moderate activity was found in the endothelium of left femoral artery at proximal end, whereas tunica adventitia showed intense activity. Intense activity was seen in the tunica intima and adventitia of both left and right femoral artery at proximal end in adult with the absence of activity in tunica media.

The deposition of lipids was found in all the tunics of the coronary and femoral artery with the media showing intense lipid deposition in almost all the age groups of the goats (Fig. 2) similar to Cook et al., (1977) observations, but was in contrary with that found by Hadjiisky et al. (2011). The deposition of lipids increased with the advancement of age in both the vessels of the animals indicating the high incidence of atherosclerosis in adult goats. It was also recorded that the amount of deposition of lipids in the tunica intima of left coronary artery was more than that deposited in the right one in all the age groups of goat as observed by Kumar, (2003) in humans.
The present study confirmed the accumulation of calcium salts were only found in the tunica adventitia of proximal end of left femoral artery in adult goats (Fig. 3).

The acid phosphatase activity was limited to the endothelium and tunica externa of the coronary and femoral artery (Fig. 4). In kids, strong activity was recorded in the endothelium with the externa showing moderate activity in both left and right coronary arteries, whereas in young goats, the activity was moderate in the externa of the left coronary artery, but no activity was recorded in the endothelium. Intense activity was observed in the externa of the right coronary artery in young animals. In adults, intense activity was recorded in the tunica externa of left coronary artery with the endothelium showing very weak activity, while moderate acid phosphatase activity was noted in the tunica externa of right coronary artery with the absence of any activity in the endothelium of this vessel in the adult animals.

In kids, intense activity was recorded in both the tunics, except the media in both the femoral arteries. In young, moderate activity was noted in the intima and adventitia, with absence of activity in the media at the proximal and middle, but very weak activity was found at the distal end of both the femoral arteries. In adults, the acid phosphatase activity was moderate in the intima and adventitia, with absence of activity in tunica media at proximal end, but weak activity was observed at middle and distal end of right femoral artery.

The alkaline phosphatase activity was recorded in the endothelium, tunica externa and perivascular connective tissues of the coronary and femoral artery, which was found to be contrary to those given by Aref et al. (1968) and Oka et al. (1968). Intense activity was recorded in the tunica externa and perivascular connective tissues of left coronary artery in kids, while the right coronary artery showed very weak activity. In young, the tunica externa and perivascular connective tissues of left coronary artery showed intense activity, but no activity was found in the right coronary artery. Moderate alkaline phosphatase activity was observed in the endothelium, externa and perivascular connective tissues of left coronary artery in adult animals. But in contrast, very strong activity was recorded in the externa and perivascular connective tissues of right coronary artery in these animals.

In kids, intense alkaline phosphatase activity was recorded in the intima and adventitia of femoral artery of both the sides at their proximal and middle, but very weak activity was found at the distal end (Fig. 5). In young, moderate activity was observed in the proximal end of both the femoral artery with middle and distal end showing weak activities. In adults, moderate alkaline phosphatase activity was recorded at the proximal and distal ends of both the femoral artery with the middle part showing very weak activity. The present findings were in contrary with to those reported by Vaish et al. (2003).

ACKNOWLEDGEMENTS

The authors are very much thankful to the Dean, NVC, Nagpur, Zoology Department of Nagpur University, Nagpur and the Chief Librarian of MAFSU, IGMC, Nagpur for their extended help in the successful completion of this work in time.

REFERENCES


