Biochemical Observations on Cattle with Traumatic Pericarditis and Change in Biochemical Parameter During Isoflurane Anaesthesia for Thoracotomy in Cattle

R. Thangadurai, S. Kathirvel, S. Senthilkumar and S. Dharmaceelan
ICAR-TNAU, Veterinary College and Research Institute, Namakkal, Tamil Nadu-637002
(Received: 04-06-2015; Accepted: 06-08-2015)

Abstract
The present work was performed in 26 clinical cases of cattle with traumatic pericarditis. The biochemical observation on cattle with traumatic pericarditis and change in these parameters during thoracotomy in cattle under general anaesthesia with Intermittent Positive Pressure Ventilation (IPPV) was reported. The biochemical changes in 26 cattle affected with traumatic pericarditis were described vis-à-vis the normal values from six healthy cattle selected at random. Compared to normal values decreased total protein, increased serum urea and increased AST were observed moreover changes during different anaesthetic protocol benzodiazepines produced minimal changes on cattle during thoracotomy under general anaesthesia in cattle.

Key words: Traumatic Pericarditis, thoracotomy, general anaesthesia, biochemical

Traumatic pericarditis is a known condition affecting cattle. It result from penetration of pericardium by a foreign body migrating from reticulum. The current treatment for traumatic pericarditis in cattle is surgical management under general anaesthesia (Schatzmann, 1995). In the present paper the biochemical changes on cattle with traumatic pericarditis are described to in the diagnosis of the condition and to assess the biochemical changes in cattle during thoracotomy under general anaesthesia with IPPV in cattle.

Materials and Methods
Cross bred cows (26 nos) exhibiting symptoms of traumatic pericarditis, brought to the clinics of Veterinary College and Research Institute, Namakkal formed the clinical material. The disease was confirmed by physical examination, clinical symptom and radiological observations of heart, diaphragm and reticulum. Ten millilitres of blood was collected in a sterile dry test tube by jugular venipuncture before induction, after induction, during maintenance and after recovery (60 min after discontinuation of isoflurane anaesthesia). Six randomly selected healthy animal were used for measuring normal biochemical value to compared with that of values from affected cattle. The blood was centrifuged and the separated serum was collected in two ml storage vials for analysis. The parameters were analysed using commercial clinical diagnostic kits (Span Diagnostics Ltd, Surat, India).

The age and body weight of the animals ranged from three to five years and 248 to 350 kg, respectively. These animals were divided into four unequal groups viz. group I, II, III and IV comprising of six, seven, seven and six animals, respectively. The anaesthetic protocol was formulated using premedication with xylazine hydrochloride (0.10 mg/kg body weight i.v.) in group I, diazepam (0.10 mg/kg body weight i.v.) in group II, midazolam (0.10 mg/kg body weight i.v.) in group III, and acepromazine maleate (0.04 mg/kg body weight i.v.) in group IV, respectively. Anaesthesia was induced using guaifenesin (50.00 mg/kg body weight i.v.) with ketamine hydrochloride (4.00 mg/kg body weight i.v.). All the animals were maintained with 2% isoflurane in oxygen employing IPPV. Similar anaesthetic protocols were followed within groups in the selected animals irrespective of breed, age, body weight, and pregnancy. Non pregnant animals were selected for group I. All the animals were prepared by withholding feed and water for 24 and 12 h respectively.
Results and Discussion
The various biochemical constituents estimated are furnished. There was no significant change in the serum glucose than normal animal but there was significant (P<0.05) increase in serum glucose between the stages of anaesthesia in non-pregnant group I animals but not in other groups of animals and glucose level of group I animals differed significantly (P<0.05) from other groups but there was no significant change compared to normal values. There was a significant increase (P<0.05) in serum glucose after induction and during maintenance in group I. The serum glucose level did not differ significantly during various stages of anaesthesia in other groups. This could be attributed to the hypoinsulinemia resulting from alpha 2 receptor mediated inhibition of insulin release from pancreatic beta cells caused by the administration of xylazine hydrochloride in group I. The findings concurred with Tranquilli et al. (2007). The mean total protein content in cases of traumatic pericarditis was significantly lower than normal values. This might be due to infection wherein the albumin was lost through the capillaries. This leads to diffusion of fluid in subcutaneous tissue resulting in edema but there was no significant change in the total protein at various intervals of anaesthesia within and between groups. The findings of the present study differed from Bishop (2005) who reported a reduction of 20 per cent total protein during isoflurane anaesthesia. The findings of the present study concurred with Ramakrishna et al. (1983) and differed with the observations of Ramin et al. (2011) who reported a higher mean serum protein in cows with traumatic pericarditis than in healthy cows.

There was no significant change in the serum creatinine in traumatic pericarditis at various intervals of anaesthesia within and between groups. The values were within the normal range and revealed that the anaesthetic drugs did not influence renal blood flow and glomerular filtration rate (Chandran, 2010). The findings concurred with William (1995). The mean serum urea content in cases of traumatic pericarditis was significantly lower than normal values. This might be due to renal damage as suggested by Ramin et al. (loc. cit) but there was no significant change in the serum urea at various intervals of anaesthesia within and between groups. The values were within the normal range during anaesthesia and could be attributed to the non-impairment of renal blood flow and glomerular filtration rate by the anaesthetic protocols employed in the present study. The findings concurred with Chandran (loc. cit). The mean aspartate amino transferase content in cases of traumatic pericarditis was significantly higher than normal values. But there was no significant change in the aspartate amino transferase at various intervals of anaesthesia within and between groups. The values were within the normal range and revealed that the anaesthetic protocol did not cause impairment of hepatic blood flow and tissue damage. The findings concurred with Cupples et al. (1982). The increased baseline value of AST could be attributed to the myocardial damage due to traumatic pericarditis as was observed by Ramin et al. (loc.cit).

There was no significant change in calciums compared to normal animals and at various intervals of anaesthesia within and between groups and from normal values. The serum calcium level is considered to be pH dependent (Tranquilli, loc. cit). The insignificant change in the calcium level in the present study could be attributed to the mechanical ventilation that maintained eucapnia and normal acid base status during anaesthesia in all the animals. There was no significant change in potassium than normal animal and at various intervals of anaesthesia within and between groups and from normal values. The serum potassium level is considered to be pH dependent (Tranquilli, loc. cit). The insignificant change in the potassium level in the present study could be attributed to the mechanical ventilation that maintained eucapnia and normal acid base status during anaesthesia in all the animals.

Summary
The biochemical changes in 26 cattle affected with traumatic pericarditis were described vis-à-vis the normal values from six healthy cattle selected at random. Compared to normal values decreased total protein, increased serum
urea and AST were observed but changes during different protocol benzodiazepines produced minimal changes on cattle during thoracotomy under general anaesthesia in cattle.

References

Carcass Characteristics of Rabbits Fed with Tree Fodders

Karu Pasupathi1, H. Gopi, M. Babu and K. Kumanan
Institute of Animal Nutrition, Kattupakkam – 603 203

(Received : 11-04-2015; Accepted : 15-04-2015)

Abstract
A study was conducted to assess the carcass characteristics of rabbits fed with tree fodders. Thirty two weaned bunnies of New Zealand White breed aged between seven to nine weeks were individually weighed and were randomized into 4 treatments with eight replicates (four males and four females) in each. The treatment groups were concentrate feed 50% of dry matter intake with Desmanthus virgatus (T1); Leucaena leucocephala (T2); Erythrina indica (T3) and Artocarpus heterophyllus (T4). The rabbits were slaughtered after eight weeks of growth trial and found that Erythrina indica could be included up to 50 % level since the carcass characteristics are comparable with desmanthus. The level of inclusion of Artocarpus heterophyllus and Leucaena leucocephala can be reduced (less than 50 %) to obtain better results on carcass characteristics.

Key words: Rabbit, tree fodder, carcass characteristics

In India, most rabbit growers are landless farmers maintaining them in their backyard to meet the family protein needs and to generate part of income for their livelihood. Organized commercial units of rearing are still in infancy. Rabbits are efficient converter of forage into meat. Hence, these landless farmers are feeding their rabbits with locally available grasses, shrubs, tree fodders and vegetable wastes. Due to the easy availability of tree fodder at free of cost and availability throughout the year, it forms the major feed for rabbits. The agricultural land shrinking due to urbanization also necessitates minimizing the land use for fodder production. Hence, the present study was