Analysis of Haemato-biochemical Parameters during Diarrhoeic Condition of Sirohi Goats

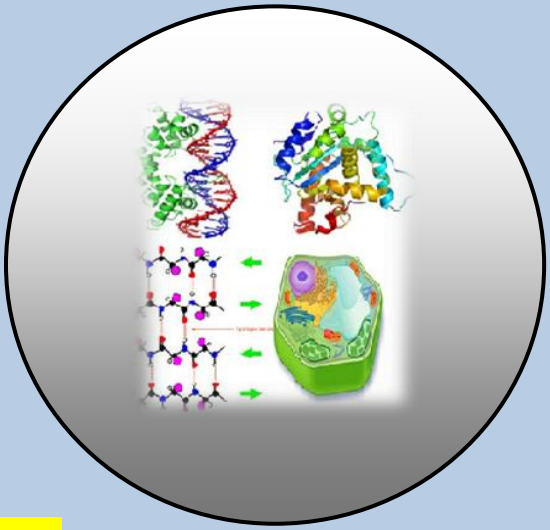
By

Arvind Kumar Pandey, Nirupama Dalai, Shashank Shekhar, Subha Ganguly, Arpita Padhy and Saraswat Sahoo

ISSN 2319-3077 Online/Electronic
ISSN 0970-4973 Print

Journal Impact Factor: 4.275
Global Impact factor of Journal: 0.876
Scientific Journals Impact Factor: 3.285
InfoBase Impact Factor: 2.93
Index Copernicus International Value
IC Value of Journal 6.01 Poland, Europe

J. Biol. Chem. Research
Volume 32 (2) 2015 Pages No. 859-862



Journal of Biological and Chemical Research

An International Peer Reviewed / Refereed Journal of Life Sciences and Chemistry

Indexed, Abstracted and Cited in various International and National Scientific Databases

Published by Society for Advancement of Sciences®

J. Biol. Chem. Research. Vol. 32, No. 2: 859-862, 2015
(An International Peer Reviewed / Refereed Journal of Life Sciences and Chemistry)
Ms 32/2/105/2015

ISSN 0970-4973 (Print)
ISSN 2319-3077 (Online/Electronic)

http:// www.sasjournals.com
http:// www.jbcr.in
jbiolchemres@gmail.com
info@jbcr.in

RESEARCH PAPER

Received: 26/09/2015 **Revised: 30/10/2015** **Accepted: 05/11/2015**

Analysis of Haemato-biochemical Parameters during Diarrhoeic Condition of Sirohi Goats

Arvind Kumar Pandey[1], Nirupama Dalai[1], Shashank Shekhar[2], Subha Ganguly[3]*, Arpita Padhy[3] and Saraswat Sahoo[4]

[1]Department of Veterinary Physiology and Biochemistry, [2]Department of Animal Genetics and Breeding, [3]Department of Veterinary Microbiology, [4]Department of Veterinary Gynaecology and Obstetrics/ Teaching Veterinary Clinical Complex, Arawali Veterinary College (Affiliated with Rajasthan University of Veterinary and Animal Sciences, Bikaner), N.H. – 52 Jaipur Road, V.P.O. Bajor, Dist. Sikar, Pin - 332001, Rajasthan, India

ABSTRACT

Goat farming is considered as the best option for the rural farmers in developing countries which improves the status of household nutrition and economy as well as boosts capital storage and self employment (Kumar, 2007). Goats are economically important short-day ruminants (Machugh and Bradley, 2001) which experience a variety of ecological challenges like wide variation in temperature, humidity and pathogenic invasions (Kaushalendra and Haldar, 2012).
Key words: Biochemical, Diarrhoea, Haematology, Haemoglobin and Sirohi goat.

INTRODUCTION

The Sirohi is a compact medium sized breed native to the Sirohi district of Rajasthan located in western India. The breed is also known by other names such as Devgarhi, Parbatsari and Ajmeri. Sirohi goats are dual purpose breeds i.e. for both milk and meat. The animals can be kept in poor quality rearing conditions and are resistant to major diseases and adaptable to different climatic conditions.

Although in rainy seasons frequent cases of diarrhoea are seen in the animals which are commonly referred to as Scours. Several factors contribute to the disease like enterotoxemias caused by *Clostridium perfringens*, Salmonellosis, *E. coli* infections, Coccidiosis, Cryptosporidiosis etc or excessive feeding by the animals (Durham *et al*., 1979). Paul *et al.* (2014) stated that a serious constraint to economical and intensive goat

production is the mortality of kids as a result of diarrhoea (15 to 40 %) up to the age of 3 months. It is defined as the increased frequency, fluidity or volume of fecal excretion.

Observation of a deviation of certain blood and serum parameters from their normal limits could be a guide for diagnosis of a disease condition (Omer *et al*., 2010). There is a great variation in the haematological and biochemical parameter between breeds of goats (Tambuwal *et al.,* 2002). With regard to these, the present study was aimed to evaluate the information on haematological and biochemical data of sirohi goats affected with diarrhoea. The data generated will also serve as a reference values in other species of goat affected with the same disease.

MATERIALS AND METHODS

In the present study, the blood sample was collected for processing of haemato-biochemical analysis from eight (8 No.) Sirohi goats affected with diarrhoea which were presented to the Teaching Veterinary Clinical Complex (TVCC) of Arawali Veterinary College, Sikar during the period of April to June 2015. While at the same time period, 3 ml blood samples were collected aseptically from the jugular vein of six (6 No.) animals taken as a control from the Intensive Livestock Farm Complex, Arawali Veterinary College, Sikar in EDTA containing vial and estimated for parameters like RBCs, haemoglobin and PCV as per the method described by Sharma *et al*. (2000).

For serum biochemical analysis another 7 ml blood was collected aseptically from the jugular veins of affected and control animals in a test tube without containing EDTA. Then the serum was separated from the blood and kept immediately in refrigerator at 4^{o}C. Parameters like total protein, albumin and globulin were measured by standard methods using commercial kits supplied from Primal Enterprises Ltd. (Navi Mumbai, Maharashtra, India) and that of cholesterol and ALP were measured by standard methods using commercial kits supplied from Reckon Diagnostic P. Ltd. (Gorwa, Vadodara). Minerals like chloride, potassium, sodium and calcium concentrations in the sera were estimated by standard methods using commercial kits supplied from Beacon Diagnostics Pvt. Ltd., Navsari, India.

The readings were obtained on Digital Photocolorimeter installed in the Department of Veterinary Microbiology, Arawali Veterinary College, Sikar.

RESULTS AND DISCUSSION

The estimated haematological and serum biochemical parameters are enlisted in the **Table**. The haematological study revealed that there was no significant deviation in the values of PCV and TEC from the normal range as against changed values reported by Hashemnia *et al.* (2014) in caprine coccidiosis, Hassan *et al.* (2013) in lambs and Zaki *et al*. (2010), while the Hb levels fell (5 ±0.01g/dl) below the normal range (8-12 g/dl) in accordance with Zaki *et al*. (2010).

There was no deviation from the normal ranges in cases of serum electrolytes like potassium, phosphorus, sodium and calcium. While there was a significant lowering of the chloride levels (71.15±0.21Meq/L as against the control animals 100–112 Meq/L) which is in agreement with that reported by Hashemia *et al.* (2014) and Singh *et al*. (2014),

also the total protein values dropped (5.61±0.1mg/dl as against the control animals 6.1–7.5 mg/dl) below the normal range which is in agreement with Zaki *et al.* and Hassan *et al*. (2013) and in contradiction to Mamta Singh *et al.* (2014) who reported a increase in the total protein levels.

Table 1. Serum Biochemical analysis of diarrhoeal sirohi goats.

Parameters	Control*	Diarrhoeal
Haematological		
TEC ($\times 10^6/\mu L$)	8-18	15
Haemoglobin (g/dl)	8-12	5 ±0.01
PCV (%)	22-38	31.89±0.01
Biochemical		
Potassium (mEq/l)	3.8–5.7	7.62±0.11
Phosphorous (mEq/l)	3.7–9.7	7.54±0.12
Sodium (mEq/l)	137–152	137.46±0.23
Calcium (mEq/l)	9.0–11.6	9.95±0.12
Chloride (mEq/l)	100–112	71.15±0.21
Total protein (g/dl)	6.1–7.5	5.61±0.1
Cholesterol (mg/dl)	65–136	85.89±0.21

*__Source:__ Merck Veterinary Manual 10th Edition.

The study reveals that there is very minor change in the haematological profile of the adult diarrhoeal goats, the lower levels of chloride can be attributed to their losses in diarrhoea and increased K^+ levels due to their relative increase in plasma. Total protein decreased because diarrhoea also leads to depletion of energy source and loss of albumin and globulin from plasma.

CONCLUSION

The current study was undertaken to study the haematological and biochemical changes in diarrhoeal goats. The study revealed that the haematological values were fluctuating towards a lower value (5 g/dl as against 8-12 g/dl in control animals), the rest of the parameters (PCV and TEC) were within the normal range. Among the serum biochemical parameters, the values of total protein (5.61±0.1mg/dl) and chloride (71.15±0.21Meq/l) decreased in diarrhoeal animals as against the control animals (6.1–7.5 mg/dl) & (100–112 Meq/l) respectively, while the values of potassium increased in diarrhoeal goats as compared to the non-diseased ones.

ACKNOWLEDGMENTS

The authors are thankful to Hon'ble Dean, Arawali Veterinary College for providing the necessary facilities to carry out this original research work and to the Head, Department of Veterinary Microbiology and In-charge, Teaching Veterinary Clinical Complex (TVCC), Arawali Veterinary College, Sikar.

REFERENCES

Durham, P.J.K., Stevenson, B.J. and Farquharson, B.C. 1979. Rotavirus and corona virus associated diarrhoea in domestic animals. *N.Z. Vet. J*., 27: pp. 30.

Hashemnia, M., Tafti, A.K., Razavi, S.M., Nazifi, S. Jan - Mar 2014. *J. Parasit. Dis*., 38(1): 116–123.

Hassan, M.M., Hoque, M.A., Islam, S.K.M.A., Khan, S.A., Roy, K. and Banu, Q. 2011. A prevalence of parasites in black Bengal goats in Chittagang, Bangladesh. *Int. J. Livest. Prod*., 2(4): 40-44.

Kaushalendra and Haldar, C. 2012. Correlation between peripheral melatonin and general immune status of domestic goat *Capra hircus*: A seasonal and sex-dependent variation. *Small Ruminant Res.,* 107: 146-156.

Kumar, S. 2007. Commercial goat farming in India: An Emerging Agri-business opportunity. *Agricultural Economics Research Review*, 20: 503-520.

Machugh, D.E. and Bradley, D.G. 2001. Livestock genetic origins: goats buck the trend. *Proc Nat Acad Sci,* USA, 98: 5382-5384.

Omer, S.A., Salawa, M.E., Khougali, H., Agab and Gussey, and Samad, H.A. 2010. Studies on some biochemical and haematological indices of Sudanese camels (*Camelus dromedarius*), *Sudan University of Science and Technology Bulletin*, pp. 1-7.

Paul, S., Sharma, D.K., Boral, R., Mishra, A.K., Nayakwadi, S., Banerjee, P.S. and Pawaiya R.S. 2014. Cryptosporidiosis in goats; a Review. *Adv. Anim. Vet. Sci*., 2(3S): 49-54.

Sharma, I.J. and Singh, H.S. 2000. Students Laboratory Manuals of Veterinary Physiology, 1st ed., *Kalyani Publishers*, New Delhi, India.

Singh, M., Gupta, V.K., Mondal, D.B., Bansal, S.K., Sharma, D.K., Shakya, M., Gopinath, D. 2014. *International Journal of Advanced Research*, 2(7): 746-750.

Tambuwal, F.M., Agale, B. M. and Bangana, A. 2002. Haematological and serum biochemical values of apparently healthy red Sokoto goats. *Proceedings of 27th Annual Conference of Nigerian Society of Animal Production*. pp. 50-53.

Zaki, M.S., Ata, N.S., Shalaby, S. I., and Zytoon, E.M. 2010. *Life Science Journal*, 7(3): 129-132.

Corresponding author: Dr. Subha Ganguly, M.V.Sc., Ph.D., F.S.A.Sc.; Sr. Associate Editor & Reviewer (*JBCR*); Associate Professor and Head, Department of Veterinary Microbiology, Arawali Veterinary College, Sikar – 332001, Rajasthan, India.
Email: ganguly38@gmail.com