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Effect of Intraperitoneal Exutade Existing Upon The Total and Differential Leukocyte Count in Cattle with Traumatic Reticuloperitonitis

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Summary

The aim of this study was to determine any effect of existing intraperitoneal exudate on total and differential leukocyte counts in cattle with TRP and so, support the diagnosis of diffuse peritonitis in TRP cases. In this study, 30 cattle with TRP and 20 healty cattle for control were used. Ten of the 30 cattle with TRP have peritoneal exudate. But the others have not.

In this investigation, there were a statistical difference between some parameters (total leukocyte, total neutrophil, band neutrophil and lymphocyte) of groups of cattle with TRP (having peritoneal exudates or not) ($P<0.05$). But there were no statistical difference between other parameters of groups ($P>0.05$).

Consequently, it was understood that total and differential leukocyte counts may support the diagnosis of diffuse peritonitis cases of cattle with TRP.

Keywords: Cattle, TRP, total leukocyte, differential leukocyte, peritoneal exudate

Sığırların Retikuloperitonitis Hastalığında Total ve Diferensial Lökosit Sayısı Üzerine İntraperitoneal Eksudatın Varlığının Etkisi

Özet

Bu çalışmanın amacı RPT'li sığırların total ve diferensial lökosit sayıları üzerine intraperitoneal eksudatın olup olmamasının etkisini araştırmak ve RPT olgularında diffuz peritonitisin teşhisini desteklemektir. Bu çalışmada, 30 RPT'li sığır ve control için 20 sağlıklı sığır kullanıldı. RPT'li 30 sığırın 10 tanesinin peritoneal eksudatı vardı. Fakat diğerlerinde yoktu.

Bu araştırmada, peritoneal eksudata sahip olup olmamasına göre RPT'li sığırların bazı parametreleri (total lökosit, total nötrofil, bant nötrofil ve lenfosit) arasında istatistiki fark vardı ($P>0.05$). Fakat grupların diğer parametreleri arasında istatistikî fark yoktu ($P>0.05$).

Sonuç olarak, RPT'li sığırlarda total lökosit ve diferensial lökosit sayılarının diffuz peritonitis olgusunun teşhisini destekleyebileceği anlaşıldı.

Anahtar sözcükler: Sığır, RPT, total lökosit, diferensial lökosit, peritoneal eksudat

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INTRODUCTION

Traumatic reticuloperitonitis (TRP) is one of the most important alimentary tract diseases of the cattle in the world and in the Kars province[1-4]. Acute peritonitis is characterised by anorexia, low milk production, ruminal stasis and abdominal pain. Rapid recovery may occur or the disease may persist in a chronic form or spread widely to produce an acute diffuse peritonitis[5,6].

In case of TRP total and differential leukocyte counts provide a good diagnosis and prognostic data. The leukocyte picture changes, total leukocyte count increase and differential leukocyte rate slide to neutrophilie[5,7,8].

In the cases without treatments occur usually diffuse peritonitis or inflamation in other organs. Acute diffuse peritonitis is highly fatal form of the TRP and have turbit and fibrous peritoneal fluid. Detection of the acute diffuse peritonitis with the collections of peritoneal exudate offer important information about the disease and its prognosis[8].

In some cases, peritoneal fluid collection may be impossible, such as; insufficient asepsis, improper position of veterinary, animal or environment, misbehaviour of the animal, etc. In the situations, like this, detection of acute diffuse peritonitis may be grove difficulty and for confirming of the circumstance may be required another techniques. For that reason, the aim of this study was reveal relationship between total and differential leukocyte count with existence of intraperitoneal exudate in cattle with TRP.

MATERIALS and METHODS

Animas materials: A total of 50 cattle were used for this study. Twenty of them was clinically healthy and used for control. Thirty of total cattle were affected with TRP. TRP was diagnosed by means of clinical picture, ferroscopy and Glutaraldehyde (GA) test methods[9-11]. After the collection of peritoneal exudate, these cattle with TRP were divided into two groups according to having peritoneal exudate or not, numbers of groups as follows; 10 and 20 respectively.

Peritoneal fluid collections: Abdominocentesis for the collection of peritoneal fluid were made in site of 10 cm cranial and 10 cm to the right-hand side of the umbilicus[5]. The differentiation of peritoneal fluid (transudate or exudate) were made by Rivalta test, based on existing total protein in peritoneal fluid[12]. Only the cattle with TRP having exudative peritoneal fluid were used for group A and other cattle with TRP evaluated group B in this study.

Blood collections: Required fresh blood for total and differential leukocyte count obtained from jugular vein.

Laboratory analyses: Total leukocyte (TL) count was made by means of Thoma slide. One hundred leukocytes on the Giemsa stain blood smear were observed to estimate the differential leukocyte (DL) rates[10,12]. For the gulutaraldehyde (GA) test, 1.4% GA test solution was mixed with whole fresh blood samples in 1/1 ratio and results evaluated as follows; coagulation between 0-15 minute: GA test positive, coagulation after 15 minute GA test negative. 100 ml 1.4% GA test solution consist of 5.6 ml Glutaraldehyde (solution 25% in water-Merck 530895), 94.4 ml 0.9% sodium chloride in water and 200 mg sodium EDTA[13].

Statistical analyses: Differences between mean values of each groups were analysed with Minitab statistical package[14]. 2-Sample t test was used to determine the statistical significance between values.

RESULTS

All groups' body temperatures, TL counts and DL rates were illustrated in the Table. It was seemed that the temparature degrees, mature neutrophil rates and basophil rates have no statistically differences between control or experimental groups ($P>0.05$). Again, except of these parameters, there were no statistically differences between experimental groups for the monocyte and eosinophil counts ($P>0.05$).

Table 1. Body temperature, TL count, DL rate and their statistical comparison of groups (Mean ± S.E. Mean).
Tablo 1. Grupların vücut ısısı, total lökosit sayıları, diferensiyal lökosit oranları ve grupların istatistiki karşılaştırmaları (X±Sx).

Parameters	Control Animals (n=20)	Group A (n=10)	Group B (n=20)
Temperature (°C)	38.81±0.08	38.92±0.11	38.83±0.05
Total leukocyte ($10^3/\mu l$)	82.20±1.72^c	151.2±11.8^a	121.6±5.82^b
Total neutrophil (%)	29.15±1.72^c	61.60±1.05^a	50.7±2.36^b
Bant neutrophil (%)	1.25±0.23^c	35.9±2.75^a	25.05±3.13^b
Mature neutrophil (%)	27.9±1.84	25.7±2.09	25.65±2.31
Lymphocyte (%)	59.3±1.52^a	35.0±0.97^c	43.65±1.81^b
Monocyte (%)	8.15±0.59^b	3.3±1.1^a	4.55±1.04^a
Eosinophil (%)	3.4±0.47^b	0.1±0.1^a	1.1±0.60^a
Basophil (%)	0±00	0±00	0±00

The differences between the values having the different letter in the same line are statistically significant ($P<0.05$).

DISCUSSION

The data of control animals were in normal ranges[5]. However this values in experimental groups showed some differences as follows; body temperatures, mature neutrophil and basophil rates were similar to values of control animals, but TL counts, total neutrophil, lymphocyte, monocyte and eosinophil rates were different from control animals' data. This situation were resemble to the cattle with TRP as reported by literature[5,7,8].

In the aspect of the Table, there were no statistically differences between group A and B in some parameters including body temperature, mature neutrophil, monocyte, eosinophil and basophil values. For that reason, it may be observe these parameters have no importance about differences of cattle with TRP according to having exudate or not.

But, there was a significant difference in TL and total neutrophil counts between A and B groups ($P<0.01$). This difference may originated from difference of band neutrophile rates. Because while there was a significant difference between groups in band leukocyte ($P<0.05$) similarly to TL and total neutrophil counts, there was not any significant difference in mature leukocyte ($P>0.05$). At that time there was also a significant difference in lymphocyte rate between these groups ($P<0.01$). But this circumstance exhibited a contrary condition with TL and total neutrophil counts. While one of them was fall, the other one was high.

As a consequence, it was observed in this study that there were a statistically significant relationship between existence of intraperitoneal exudate with TL, total neutrophil, band neutrophil and lymphocyte counts. However, there were any relationship between existence of intraperitoneal exudate with other parameters observed in this study.

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