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SNUFFLES DISEASE IN RABBITS: 3- HEMATOLOGICAL PARAMETERS

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ABSTRACT
Snuffles disease is a major problem in rabbits, caused by *Pasteurella multocida* and it is important to identify all parameters associated with this disease such as hematological parameters which are the aim of this study. For this reason group of rabbits (27) were injected I/P with 10^2 CFU/ml *P. multocida*, other group, and control group injected I/P with pbs. All the hematological parameters were recorded at 4th, 8th, 12th, 16th and 20th day post infection. The results revealed marked leukocytosis accompanied by increase percent % of the neutrophils, monocytes and lymphocytes in infected group comparable to parameters of control group. The eosinophils% was 2% (normal) in both infected and control groups. Other hematological parameters such as hemoglobin and packed cell volume% were showed gradual decrease along the experiment periods. *P. multocida* induce during experimental infection marked leukocytosis accompanied by increase percent of Neutrophils, Monocytes and Lymphocytes together with marked gradual decrease of hemoglobin and packed cell volume%.

KEYWORDS: snuffles disease hematological parameters.

INTRODUCTION

Snuffles disease a major problem in rabbits caused by various *Pasteurella multocida* serotypes, the disease occurs during the stress factor such as shipping, mating, experimental handling and malnutrition[1,2]. *P. multocida* already present in upper respiratory tract and tympanic bullae of rabbits and during seasonal influences and other stresses factor the *P. multocida* multiply rapidly and induce the disease in the lungs and upper respiratory tract such as pneumonia, otitis media and rhinitis together with septicemia[3,4]. For the importance of this disease in rabbits, this study aimed to identify the hematological parameters associated with this experimental disease in rabbits using *P. multocida*.

MATERIALS & METHODS

A local strain of *Pasteurella multocida* were used, reidentified[5], LD50 and infective dose were determined according[6] method. LD50 was 10^7 CFU/ml, infective dose was 10^2 CFU/ml.

Experimental Design: Two groups of rabbits, first group [7] kept as control injected I/P with pbs. The second group (27) rabbits were injected I/P with 10^2 CFU/ml *P. multocida.*

Hematological Parameters

1. Leukocytes Count: By using hemocytometer chamber and according [7] the leukocytes were counted.
2. Differential Leukocytes count: Blood smear stained by leishman's stain and examined using battlement method by counting leukocytes cells and determine the neutrophils, monocytes and lymphocytes. Percent (%) according to [7].
3. Hemoglobin (Hb) Concentration: By using the spectrophotometer and drabkin's reagent as diluents and according to[7] method the amount of Hb concentration were recorded for each animal.
4. Packed Cell Volume (PCV): Using the hematocrit method, hematocrit centrifuge and microhematocrit reader as in [8].

RESULTS & DISCUSSION

Leukocytes Count (Leuk. C)

The results showed differences in the mean values of leukocytes count in infected group (I G) and control group (C G) in 4th, 8th, 12th, 16th and 20th days post infection (Table-1).

TABLE1: Mean values of total Leukocytes count, Neutrophils%, Monocytes% and Lymphocytes% of *P. multocida* infection in I.G. and C.G.

Day	I.G. (Leuk. C)	C.G. (Leuk. C)	I.G. (Neut. %)	C.G. (Neut. %)	I.G. (Mono.%)	C.G. (Mono.%)	I.G. (Lymph.%)	C.G. (Lymph.%)
4	7400±108 M SE	6325±143.6 M SE	65.75±0.47 M SE	50±1.58 M SE	2.5±0.28 M SE	2 ± 0.40 M SE	31.75±0.50 M SE	45±1.6 M SE
8	7900±108 M SE	6325±118.1 M SE	60.25±0.25 M SE	50±2.1 M SE	5 ± 0.70 M SE	2 ± 0.40 M SE	34.75±0.50 M SE	45±2.3 M SE
12	8125±47.9 M SE	6325±25 M SE	52.5±0.64 M SE	50±0.82 M SE	5.75±0.25 M SE	2 ± 0.70 M SE	41.75±0.85 M SE	45±1.2 M SE
16	8125±85.4 M SE	6325±131.5 M SE	50.25±0.25 M SE	50±1.1 M SE	3.5±0.28 M SE	2 ± 0.70 M SE	46.25±0.25 M SE	45±1.08 M SE
20	8200±40.8 M SE	6325±62.9 M SE	48.25±0.47 M SE	50±0.71 M SE	2.25±0.25 M SE	2 ± 0.40 M SE	49.50±0.64 M SE	45±0.28 M SE

M: Mean= 4 animals, SE: Standard error, I.G.: Infective group, C.G.: control group.

Also the results showed differences in mean values percent of neutrophils, monocytes and lymphocytes in the infected group (I G) and control group (C G) at the 4th, 8th, 12th, 16th and 20th days post infection (Table-1).). The mean values of eosinophils percent (%) in the infected group and control group were 2% along the periods of the experiment.

Hemoglobin Concentration and Packed Cell Volume percent%

The results showed gradual decrease in the mean values of hemoglobin (Hb) concentration and in packed cell volume (pcv) % at 4th, 8th, 12th, 16th, and 20th days post infection in the infected group comparable to the mean values of Hb and pcv% in control group (Table-2).

TABLE 2: Mean values of hemoglobin (Hb) concentration g/dl and packed cell volume (pcv %) after *P. multocida* infection in I.G. and C.G.

Day	I.G. (Hb)	C.G. (Hb)	I.G. (pcv %)	C.G. (pcv %)
4	8.70 ± 0.18	9.75 ± 0.25	28.5 ± 0.28	29.5 ± 0.63
	M SE	M SE	M SE	M SE
8	7.97 ± 0.06	9.75 ± 0.48	27.25 ± 0.25	29.75 ± 1.8
	M SE	M SE	M SE	M SE
12	7.17 ± 0.06	9.75 ± 1.11	26.5 ± 0.28	29.75 ± 0.2
	M SE	M SE	M SE	M SE
16	6.90 ± 0.07	9.75 ± 0.75	26 ± 0.81	29.75 ± 3.7
	M SE	M SE	M SE	M SE
20	6.75 ± 0.18	9.75 ± 0.48	25.75 ± 0.25	29.75 ± 0.48
	M SE	M SE	M SE	M SE

M: Mean= 4 animals, SE: Standard error, I.G.: Infective group, C.G.: control group.

Leukocytosis is the feature of increased levels of white blood cells in blood stream occurred as a result of activation of bone marrow by *P. multocida* Ags [9,10] so increase levels of neutrophils%, monocytes% and lymphocytes% which more evident in this study the neutrophilia occurred as a result of bacterial toxins in this case *P. multocida* induced pyogenic infection either localized or generalized [11], similarly monocytes increased their level% as a result bacterial toxin (*P. multocida)* in this study, similar to other bacterial infections such as brucellosis and tuberculosis[11]. Also lymphocytes% increased with *P. multocida* infection in this study similar to other bacterial infections such as tuberculosis, Brucellosis and syphilis[11]. Mean values of hemoglobin and packed cell volume were gradually decreased in infective group comparable to control group along the different periods post the infection with *P. multocida,* the gradual decrease of Hb and pcv% may related to the decrease the release of iron from macrophages to plasma cells, then reduced red cell life span and inadequate erythropoietin response to anemia [11]. In addition bacterial cells (*P. multocida)* in this study play a role in attachment with red cell wall, then decrease their number and life span [8].

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