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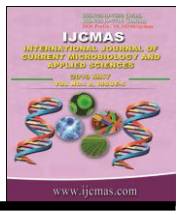

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Haemato-Biochemical Alterations in Dogs Affected with Superficial Pyoderma

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A B S T R A C T

The present study was conducted on 205 dogs of different sex, age and breeds affected with dermatological affections for a period of one year i.e. July 2017 to June 2018. Based on diagnosis, 205 dogs were found affected with dermatological affections. Among 205 dogs, (15.61%) 32 dogs were found affected with superficial pyoderma. The values of haemoglobin in dogs affected with superficial pyoderma were found significantly lower and values of packed cell volume were found non-significantly lower as compared to healthy control. The mean values of total leukocyte count were significantly higher and mean value of total erythrocyte count was significantly lower in superficial pyoderma affected dogs. The differential leukocyte count showed significant neutrophilia and lymphopenia in superficial pyoderma affected dogs. Non-significant difference was observed in the serum ALT, AST, BUN, creatinine, total protein and albumin values. The mean value of glucose was significantly decreased in dogs affected with superficial pyoderma.

Introduction

Superficial pyoderma is a bacterial infection confined to the superficial portion of the skin. Bacteria may cause an infection secondary to local trauma, scratching, contamination due to poor grooming, seborrhea, parasitic infestation, hormonal factors, local irritants and allergies in dogs (Bajwa, 2016). Lesions may be quite superficial and may affect only the epidermis or may involve deeper structures in the dermis or subcutaneous tissue. Pyoderma is classified according to the depth of infection as surface, superficial and deep pyoderma. Canine superficial pyoderma is defined as a superficial bacterial infection of the epidermis and hair follicles and is usually secondary to allergic, parasitic, endocrine, immune-mediated and conformational or keratinisation disorders (Scott *et al.,* 2001; Patel, 2006and Pinchbeck, 2010.).

Materials and Methods

In present study 205 dogs were reported at Veterinary Clinical Complex of college of Veterinary and Animal Science, Navania,

Udaipur with different dermatological affections. Superficial pyoderma in dogs was diagnosed on the basis of history and clinical examination. The dogs having superficial pyoderma was subjected to detailed physical examination viz. general condition, signs of itching, general appearance, behavior, body condition etc.

Hematological examination was conducted as per standard technique to determine haemoglobin (Hb), Packed Cell Volume (PCV), Total Erythrocyte Count (TEC), Total Leukocyte Count (TLC), Differential Leukocytes Count (DLC) by (Feldman *et al.*, 2000). All the biochemical parameters viz. ALT, AST, BUN, Creatinine, serum glucose, total protein and Albumin were estimated by using Automated serum biochemistry Analyzer (IDEXX Vet test chemistry analyzer)

Results and Discussion

Mean±SE values of haematological parameters in healthy and dogs affected with superficial pyoderma are presented in Table 1. The mean values of haemoglobin, packed cell volume, total erythrocytes counts and total leukocyte counts in healthy dogs and dogs affected with superficial pyoderma were 14.09±0.414 and 12.60±0.183 g/dl; 38.99±0.804 and 37.32±0.418 %; 6.74±0.212 and 6.29±0.067 million/mm^3; and 11.58±0.242 and 15.05±0.194 per mm^3, respectively.

The mean±SE value of hemoglobin in dogs affected with superficial pyoderma were significantly ($p<0.01$) lower (12.60±0.183) g/dl as compared to healthy control group (14.09±0.414) g/dl. The mean value of total leukocyte count (per mm^3) were significantly ($p<0.01$) higher (15.05±0.194) in superficial pyoderma affected dogs as compared to healthy control group (11.58±0.242). The mean value of total erythrocyte count (million/mm^3) was significantly ($p<0.05$) decreased in superficial pyoderma affected dogs (6.29±0.067) as compared to healthy control group (6.74±0.212). Non-significant decrease was recorded in mean value of packed cell volume of affected dogs as compared to healthy group.

The mean±SE values of neutrophils, lymphocytes, monocytes and eosinophils count in healthy control group and dogs affected with superficial pyoderma were 69.67±0.989 and 78.22±0.655 %; 23.34±0.667 and 16.91±0.703 %; 2.84±0.402 and 1.91±0.158 %; 4.17±0.402 and 2.67±0.203 %, respectively. The differential leukocyte count (%) in superficial pyoderma dogs showed significant ($p<0.01$) neutrophilia and lymphocytopenia as compared to healthy control group. A non-significant ($p>0.05$) difference of mean values of monocyte (1.91±0.158 and 2.84±0.402) and eosinophils (2.67±0.203 and 4.17±0.402) were recorded in superficial pyoderma affected dogs as compared to healthy control dogs.

These findings of present investigation were in accordance with that of Nair and Nauriyal (2007); Gera *et al.,* (2009) and Beigh *et al.,* (2013). The decreased hematological indices (Hb and TEC) recorded in the present observations might be due to the prolonged reduced appetite and/or blood loss from scratching and inflammatory response of the body due to these infections (Sharma *et al.*, 2013).

Stress and bacterial toxins had been suggested as possible reason for marked leukocytosis (Aujla *et al.,* 1997). The increased TLC was associated with neutrophilia and concomitant lymphopenia. Neutrophilia with corresponding lymphopenia were also reported by Shyma and Vijaykumar (2011); Beigh *et al.,* (2013) and Thapa and Sarkar

(2018). Statistically significant (P<0.01) neutrophilia may be attributed to the cell injury which in turn caused the release of substances such as leukotrien and leukocytosis promoting factors from the blood into the injured areas resulting in release of more neutrophils into the blood stream.

Serum biochemistry

Mean±SE values of serum biochemical parameters in healthy control dogs and superficial pyoderma affected dogs is presented in Table 2. Serum biochemical values in apparently healthy animal recorded were within the normal range reported by Villers (2005).

The mean±SE values of serum ALT, AST, BUN, Creatinine and Glucose recorded in apparently healthy dogs were 35.84±4.848U/L, 17.84±2.664U/L, 11.84±2.198 mg/dl, 0.88±0.12 mg/dl and 99.5±3.931 mg/dl respectively.

Table.1 Mean±SE values of haematological parameters in healthy dogs and superficial pyoderma affected dogs

Haematological Parameters	Healthy Group (n=6)	Superficial pyoderma affected dogs(n=32)
Hb (g/dl)	14.09±0.414	12.60**±0.183
PCV (%)	38.99±0.804	37.32±0.418
TEC (million/mm^3)	6.74±0.212	6.29*±0.067
TLC (per mm^3)	11.58±0.242	15.05**±0.194
Differential Leucocytes counts		
Neutrophils (%)	69.67±0.989	78.22**±0.655
Lymphocytes (%)	23.34±0.667	16.91**±0.703
Monocytes (%)	2.84±0.402	1.91±0.158
Eosinophils (%)	4.17±0.402	2.67±0.203

*: Means differ significantly (p<0.05) with control group
**: Means differ highly significant (p<0.01) with control group

Table.2 Mean±SE values of serum biochemical parameters in apparently healthy and superficial pyoderma affected dogs

Biochemical Parameters	Healthy Group (n=6)	Superficial pyoderma affected dogs(n=32)
ALT (U/L)	35.84±4.848	39.34±1.353
AST (U/L)	17.84±2.664	20.50±0.594
BUN (mg/dl)	11.84±2.198	12.72 ± 0.582
Creatinine (mg/dl)	0.88±0.12	0.89±0.043
Glucose (mg/dl)	99.5±3.931	89.71*±1.397
Total Protein (g/dl)	6.12±0.233	6.42±0.085
Albumin (g/dl)	2.8±0.094	2.6±0.073

*: Means differ significantly (p<0.05) with control group
**: Means differ highly significant (p<0.01) with control group

The mean±SE values of serum ALT, AST, BUN, Creatinine and Glucose recorded in superficial pyoderma affected dogs were 39.34±1.353 U/L, 20.50±0.594 U/L, 12.72 ±0.582 mg/dl, 0.89±0.043 mg/dl and 89.71±1.397mg/dl respectively. No significant changes ($p<0.05$) were observed in the serum ALT, AST, BUN and Creatinine in superficial pyoderma affected dogs when compared to healthy control group. While statistically significant decrease ($p<0.05$) in the mean value of glucose was observed in dogs affected with superficial pyoderma. The findings of present investigation are in agreement with that of Shyma and Vijaykumar (2011) and Lodh and Das (2013).

The mean±SE values of serum total protein and albumin recorded in apparently healthy dogs were 6.12±0.233 g/dl and 2.8±0.094 g/dl, respectively. The mean±SE values of serum total protein and albumin in superficial pyoderma affected dogs were 6.42±0.085 g/dl and 2.6±0.073 g/dl, respectively. Non-significant increase ($p>0.05$) was observed in the mean values of total protein and non-significant decrease was observed in albumin values in dogs affected with superficial pyoderma than apparently healthy dogs. These findings are in close agreement with that of Sharma *et al.,* (2013). Non-significant differences in total serum protein and albumin values were observed in present study might be due to increased inflammatory response assorted with infection (Shyma and Vijayakumar, 2011).

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