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Clinico-hemato-biochemical changes and therapeutic management of canine demodicosis: Case study

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Abstract
A one-year-old male dog was presented at clinic with the complaint of itching and skin disorder. The dog was examined clinically and haemato-biochemical parameters were investigated. Skin scrapping examination was also done from periphery of active lesions. Clinical findings revealed severe itching, alopecia and crusts lesions. Haemato-biochemical parameters revealed decrease haemoglobin, red blood cells and albumin whereas ALT and AST were found increased. Skin scrapping examination revealed presence of *Demodex canis* mites and case was confirmatory diagnosed as canine demodicosis. After proper diagnosis the dog was treated with injection of ivermectin @ 0.4 mg/kg body weight, subcutaneously and repeated weekly for the next four weeks, Injection Intacef Tazo 250 mg, intramuscular for 3 days, Injection pheniramine maleate @ 1 mg/kg b.wt for 3 days and syrup Vitabest Derm (vitamins, Omega 6 and omega fatty acids supplement), given orally 5ml, twice a day for one months and also advised to bath dog with Sulbenz shampoo followed by spray with Ridd solution (Amitraz 12.5% w/v) @ 4ml/litre of water, on weekly interval for 2 months. After two months of treatment, the dog recovered completely and the mite infestation subsided.

Keywords: Canine demodicosis, mange, amitraz, ivermectin

Introduction
Canine demodicosis is an inflammatory skin infection caused by *Demodex canis* mites (Mueller, 2014) [8]. Mange caused by *Demodex canis*. It is also known as follicular mange/ demodectic mange/red mange, young dog's skin commonly affected, especially the short-haired dog breeds (Sakina, 2011) [17]. Canine demodicosis is a most common cutaneous infection in canines (Sivajothi *et al.*, 2015) [12, 15].
Canine demodicosis occurs in two forms, generalized and localised (Kumar *et al.*, 2015). Localized demodicosis starts with one or two spots, commonly lesions present at hairless spots, especially on muzzle, face, legs and around the eyes, which needs no treatment but in Generalized demodicosis most common clinical signs are erythema, alopecia, hyperkeratosis, pustules crusts and secondary infection like pyoderma in form of frequently complication (Alice, 2006) [1]. For diagnosis of demodicosis is the microscopic evaluation of material obtained by deep skin scrapping is the gold standard method (Scott *et al*., 2001) [14, 16].

Case history and clinical examination
A one-year-old, non-descript male dog with sever hair loss and itching along with general dermatological problems was presented at Veterinary Clinical Complex. The dog had a history of lethargy, weakness and going down in body condition continuously.
Clinical examination of the dog revealed severe itching, alopecia, pale mucous membrane and emaciated condition. Affected dog had skin lesions on the face, commissure of lips, ear and ventral part of abdomen and forelimbs like erythematous lesions.

Diagnosis and treatment
Blood & serum examination and deep skin scrapping examination of affected dog were done. Blood samples were collected in EDTA containing and without anticoagulant vacutainers. The EDTA containing blood sample was used for estimation of haematological parameters and without anticoagulant blood sample was used for separation of serum by standard processes

for biochemical analysis. Haematological parameters included, haemoglobin (Hb), total erythrocyte count (TEC), total leucocyte count (TLC), packed cell volume (PCV), differential leucocyte counts were measured by standard methods and biochemical parameters like total protein, albumin & globulin, BUN (Blood urea nitrogen) and creatinine value, ALT (alanine transaminase), AST (Aspartate aminotransferase) were estimated by autoanalyzer.

Skin scrapping from periphery of active lesions were taken and dissolved in the 10 percent KOH on a slide and examine under 10x microscope for presence of mites. Skin scrapping examination revealed presence of *Demodex canis* mites. Based on physical, clinical and microscopic examination of skin lesions the case was diagnosed as canine generalised demodicosis.

Picture 1: Microscopic examination of skin scrapping showing presence of *Demodex canis* mites

After diagnosis the dog treated with injection ivermectin @ 0.4 mg/kg body weight, Subcutaneously and this was repeated weekly for the next four weeks, Injection Intacef Tazo 250 mg, intramuscular for 3 days, Injection pheniramine maleate @ 1 mg/kg body weight for 3 days and syrup Vitabest Derm contains (vitamins, Omega 6 and omega fatty acids supplement), given orally 5ml, twice a day for one months. The dog owner was also advised to bath the dog with Sulbenz shampoo followed by spray with Ridd solution (Amitraz 12.5% w/v) @ 4ml/litre of water, on weekly interval for 2 months. After two months of treatment, the dog recovered completely and the mite infestation subsided.

Results and Discussion

The most common clinical signs reported in the case study were reduced food and water intake, restlessness, sever itching, erythema and hair loss. The value of haemoglobin and RBC of affected dog were found decreased whereas WBC and eosinophils were found increased, these observations agree with by Reddy *et al.*, (2015) [12, 15] and Salem *et al.*, (2020) [13]. Decrease the value of haemoglobin and red blood cells may be a result of decreased food intake or secondary bacterial infection. The number of eosinophils were increased due to allergic reaction towards mites' infestation (Dimri *et al.*, 2000) [3]. Decrease value of albumin and increased value of globulin is due to inflammation Ulutas *et al.*, (2011) [17] and agreement with Reddy *et al.*, (2015) [12, 15]. The value of ALT and AST were increased due to stress and the value of BUN was within normal range, Similar observations were reported by Gera *et al.*, (2009) [4].

Conclusion

The affected dog case was generalised demodicosis and the most common clinical symptoms were erythema, alopecia, itching and decrease the value of haemoglobin, red blood cells and albumin. Value of ALT and AST were increased due to stress of infection. Treatment with Ivermectin, amitraz and other supportive drugs is very much effective against demodicosis in dogs.

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