

Dermatitis of camels (*camelus dromedaries*) due to Tick infestation at abattoir of Sammawah in Iraq

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Abstract: Characters of skin lesions of camels due to ticks' infestation were evaluated in abattoirs of Sammawah city of Iraq. Out of 30 camels inspected before slaughter, 10 skin specimens had no complication of scratching related to tick biting were processed for microscopical examination. Grossly the tick bite lesions showed congestion and swelling. The microscopic feature at skin attachment sites of ticks were congestion of the blood vessels of dermal plexuses and extensive haemorrhage in dermis with chronic inflammatory cellular response.

Keywords Dermatitis, camels, Tick, Sammawah Iraq

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I. Introduction

Camels is reared in desert regions of Iraq with the aim of supplying milk, meat and as a source of income beside their ability to survive harsh environment and carrying loads and walking efficiently in sandy or rough rocky land.

Ticks are obligate blood suckling ectoparasites of vertebrates, chiefly mammals including camels (Wall and Shearer, 2001). Ticks are not only damage the animal skins at the affection sites but also, they are vectors of pathogens to human or animals in their saliva, causing diseases (Anderson and Magnarelli, 2008). For example, in Iraq (AL-Tikriti et al., 1981) reported Crimean Congo haemorrhagic fever virus in human in 1979, while in domestic animals ticks have been transmitted the agents of Theileriosis and Babesiosis (Hooshmand-Rad and Hawa, 1973; Sulaiman et al., 2010).

The eradication program of tick either in Iraq or international is so expensive, and the global financial impact of tick infestations was estimated by F.A.O.1984 \$7000 million per annum (Harrow et al., 1991).

Hyalomma dromedarii and H. impeltatum were considered the main types of ticks that infested camels (Al-Ani et al., 1998; Diab et al., 2006). Hoogstraal (1979) determined Hyalomma species of ticks important vector for enzootic CCHF virus. Infestation of the camels with ticks cause emaciation and anemia and economic losses due to reduction in production.

The inflammatory reaction of the animals at feeding sites of ticks can be a barrier against the injurious effect of parasites. Alternatively, ticks can alter host reactions by saliva secretion (Ribeiro, 1995). Thus, this study was conducted at abattoir of Sammawah, Iraq at the last three weeks of July 2005. to evaluate the response of skin of camels due to direct effects of spontaneous ticks infestation regardless of mechanical complication or secondary infection.

II. Materials and Methods

Directly after camels slaughter tick and skin samples were took from 30 camels (Camelus dromedaries) of both sex and various ages at a local slaughter house at Sammawah city, Iraq during summer time when the tick infestation was high.

Control skin samples (n = 6) were obtained at non-parasitized sites. Specimens of 10 skin were immersed in fixative (buffered formalin, pH 7.0) immediately. Specimens of kin were kept for 48 hours in the fixative. And then they were dehydrated in the series of ascending grades of alcohol, embedded in paraffin and processed according to routine histological techniques. Each biopsy was sectioned at a thickness of 5 microns, and stained with Hematoxylin and eosin (H & E). Photomicrographs from the selected specimens were prepared.

III. Results

Ticks were found on numerous sites on the camels' body, but they were seen in the region of the ears and eyes, at perennial, groin and axillae and the udder frequently. The gross features of site of tick-bite was characterized by swelling and erythema which its magnitude depend on number of neighboring attached ticks.

Microscopic examination of the lesion revealed various epidermal reactions, ranging from hyperkeratosis, prakeratosis, stratum corneum and acanthosis. Different regions of dermis and hypodermis of the affected animals showed infiltration of chronic inflammatory cells and leakage of erythrocytes outside walls of the B. V.

The oval non nucleated erythrocytes, which are characteristic of camels' red blood cells, were deposited mainly in the folded dermal papillae and just under the basal layer of the epidermis to lesser degree in and around the sebaceous glands (Fig.1and Fig2). The inflammatory cell was mainly the large lymphocyte, epithelioid cells and macrophages. The inflammatory cell found mostly in the dermal papillae and in perivascular regions (Fig.3). Similarly, the hypodermis underwent hemorrhage and chronic cells infiltration between the woven collagen bundles (Fig.4) and at the regions of sweat glands congested B.V and perivascular aggregation of inflammatory cells.

IV. Discussion

Camels from the existing study were either infested (30) with ticks or were normal and not infected (6 camels) at all. This ticks were found on numerous sites on the camels' body, but there were some regions that could be the preferred feeding sites of the tick at ears, eyes, perennial groin, axillae and the udder frequently. Similar finding was recognized by Al-Ani et al. (1998). Epithelial hyperplasia, edema and necrosis were confined to the immediate surroundings of tick attachment and may have been caused, either by parasite induced tissue damage, the immune inflammatory reaction to the tick, or both. Ticks are blood-sucking arthropod, causing loses of blood of infested camels in addition to biting stress caused by ticks itself. The attachment of ticks on the skin distinguished microscopically by focal damage of the epidermis and the keratinised stratified squamous epithelium of skin. Congested blood vessels and extensive haemorrhage in the biting site with infiltration of chronic inflammatory cells. This finding is in agreement with (Sauer et al., 2000.), who stated that the saliva of ticks increases blood flow in the bite region through the secretion of vasoactive agents, keep the host's blood in the fluid form via inoculating anticoagulants that also inhibiting the inflammatory process in the host. Damage of epidermis will reduce its protective task of skin. Also epidermis lesions could be intensified by scratch and expose the dermis with its touch receptors, blood vessels and nerve endings to external environment. Therefore, haemorrhage, abscess developments due to secondary infection at the infested area are possible.

This damage also will increase the restless of the animals. According to opinions of Schmidt-Nielsen, (1964) who considered thick skin and fur coat reflects the sun and insulates the animal from the intense desert heat. Thus, damage skin will reduce the insulating characters, which is important to both energy and water balance of the desert animals (Schmidt-Nielsen, 1964). In the present study, the principal cells infiltrating was chronic mononuclear cells (lymphocytes, plasma cells and macrophage but neutrophils and eosinophil cells were not recognized in uncomplicated lesions. Latif et al. (1991) found eosinophil and neutrophils cells were the chief cells infiltrating sites of ticks affection on high resistance cattle The differences in cell type associated with high and low resistance and differences in tick ranking or burden. Furthermore, Walker and Fletcher (1987).considered higher proportions of granulocytes than in the inflammatory abscess, reduces engorgement of the ticks.

V. Figures and Tables

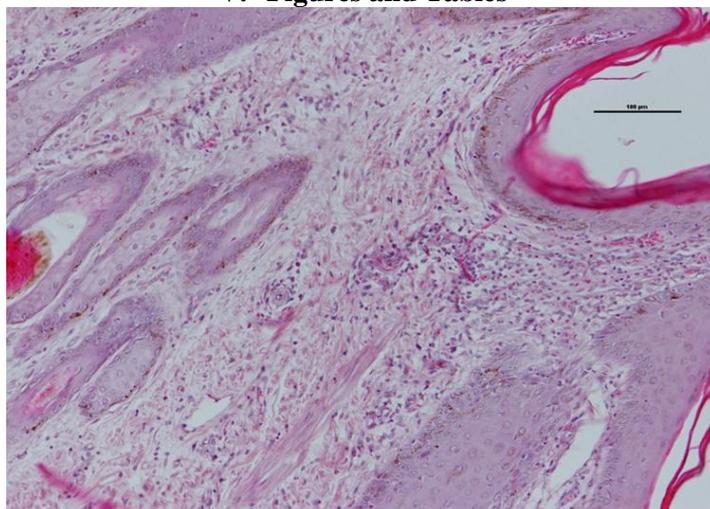


Fig.1. Skin of a camel infested with Ticks. Note infiltration of chronic inflammatory cells and leakage of erythrocytes in the dermal papillae and sebaceous gland (arrows). H&E X10. Bar=100µm.

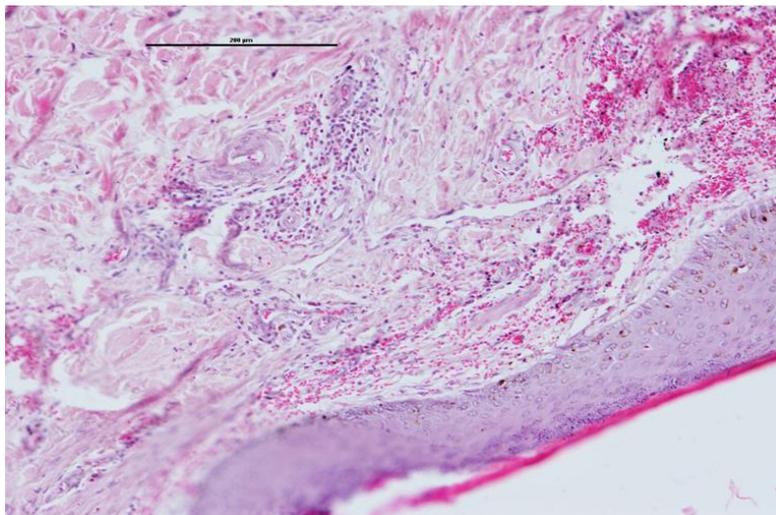


Fig.2. Camel skin. Note the excessive haemorrhage in the upper left corner of the photomicrograph and perivascular aggregation of inflammatory cells (arrow) at the site of a tick attachment and feeding. H&E X10. Bar=100µm.

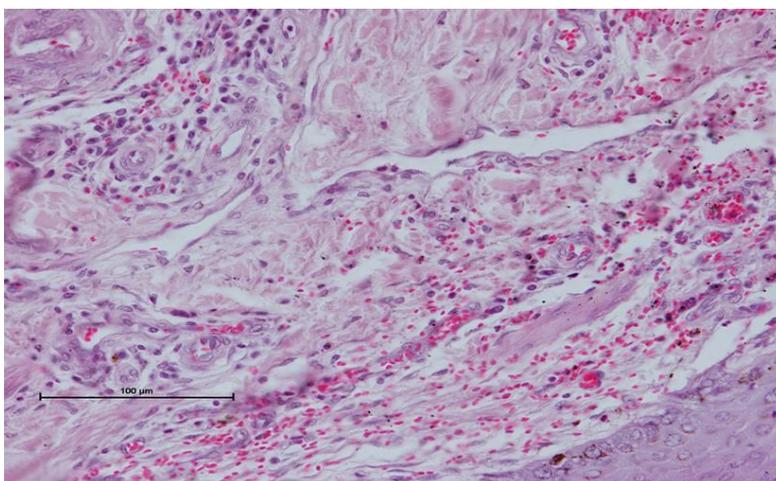


Fig.3 Greater details of Fig.2 to show haemorrhage, congested B.V and perivascular aggregation of inflammatory cells in the dermis of camel skin infested with ticks. Note the basal layer of the epidermis in the lower left corner of the photomicrograph. H&E X20. Bar=100µm.

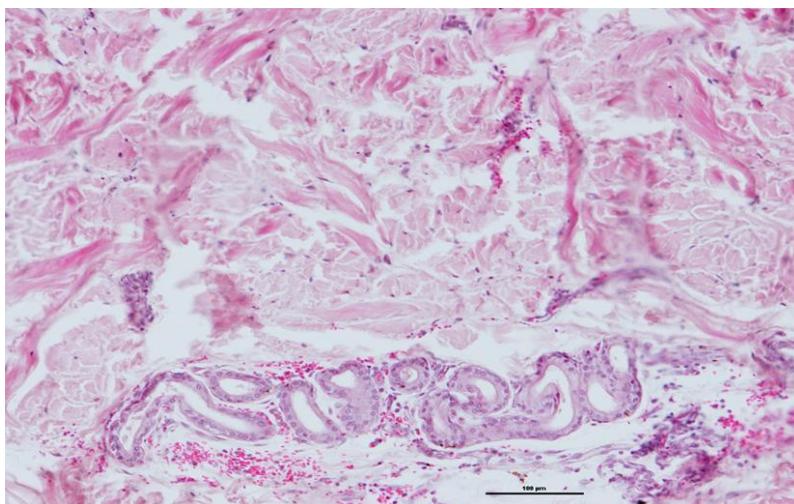


Fig.4 hemorrhage and chronic cells infiltration between the woven collagen bundles (Fig.4) and at the regions of sweat glands X10.

VI. Conclusion

In conclusion the direct effect of the ticks is anemia due to suckling blood and inducing haemorrhage. Skin inflammation due to tick infestation with or without secondary infection of the skin reduce animal production efficiency and reduce the market value of the skin and hides. So application of control measures of ticks' infestations is important to control the tick-transmitted diseases to animals and prevent re-occurrence of CCHF disease in Iraq again. Further work is needed to sort types of ticks and the difference of pathological responses in different breed of camels to determine the resistance animals.

References

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A reference list **MUST** be included using the following information as a guide. Only *cited* text references are included. Each reference is referred to in the text by a number enclosed in a square bracket (i.e., [3]). References **must be numbered and ordered according to where they are first mentioned in the paper, NOT** alphabetically.

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