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Recurrent outbreaks of Camel pox in *Camelus dromedarius* in Dhi- Qar governorate /Iraq

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Abstract
Outbreaks of pox-like exanthemas lesions were observed in camels in Dhi- Qar governorate in southern of Iraq, between May-June 2001, July 2007 and May - June 2013 in Batha deser areas, Alfager region and Alnaser region respectively. This study intended to report the case history, epidemics and the diagnostic clinical symptoms that appeared on the infected camels. A forty two suspected infected camels revealed various clinical signs of camel pox. These clinical signs included high temperature, increased in the respiratory rate, loss of appetite or complete refusal of food, ataxia, and presence of pox like lesions in different stages on the skin especially in the lint-free areas. These lesions were observed in the young animals. It was also observed that the duration of camel pox cases emergence among the herd was between 3 and 12 days.

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Camel pox is an economically important contagious skin disease of camelids and causes clinical disease in camel populations worldwide (Yousif and Al- Naeem, 2011). It is caused by camelpox virus (CMLV) and characterized by mild local skin infection and less common severe systemic infections (Bhanuprakash *et al*., 2010). A Camel pox virus (CMLV), is a member of the Orthopoxvirus genus in the Poxviridae (Afonso *et al*., 2002; Al-Ani, 2003, Peffer *et al*., 1998; Omar, 1986). Between 1893 and 1902, camel pox was first reported in Russia (Wernery and Kaaden, 2002), Rajaputana and Punjab parts of India (Leese, 1909). Later on, several strains of poxviruses were isolated from camels from different parts of the world. It was isolated in Iran, Egypt, Yemen, Kenya, the Soviet Union and Iraq (Ramyar & Hessami, 1972; Baxby, 1972, 1975; Marennikova *et al.*, 1974; Tantawi *et al.*, 1974; Davies, Mungat & Shaw, 1975; Al-Falluji *et al.*, 1979). Recently,

CMLV is regarded as unique naturally infect old world camelids, including *Camelus dromedarius* (dromedary camel) and *Camelus bactrianus* (Bactrian camel) (Wernery and Kaaden, 2002). The course and the outcome of Camel pox may vary depending on age, sex and the circulating CMLV strains, which may differ in virulence (Al Zi'abi *et al.,* 2007; Gitao, 1997; Jezek *et al.,* 1983; Kriz, 1982). The disease usually manifests in a localized form in adult camels, but under certain circumstances, generalized or fatal internal forms may be seen. The incubation period of the disease is ranged between 9–13 days, followed by fever, enlarged lymph nodes, skin lesions and prostration. Camelpox shows typical skin lesions and pass through all the stages of pock lesions progression, i.e., macules papules, pustules, vesicles and scabs.

Eruptions of the lesions are mainly localized on the head, nostrils and eyelids, as well as on the mucous membranes of the lips and the nose and also in the oral cavity. Later on, lesions may be extend to the limbs, mammary glands or scrotum. It takes 4–6 weeks for the lesions to heal. In converse, the generalized forms show lesions that may spread over the body, particularly on the head and the limbs, and swellings on the neck and abdomen. In such cases, pock lesions may be found in the respiratory and digestive tracts, and the outcome of the disease is more likely fatal (Pfeffer *et al.,* 1998). It is also observed that young camels under the age of four years and pregnant females appear more susceptible to camelpox. It is also reported that abortion rates can reach 87%, as observed in Syria (Al Zi'abi *et al.,* 2007), although this high percentage might be explained by the absence of immunity as CMLV circulation had never been reported in this country before. Camelpox is transmitted by direct contacts with sick animals through skin abrasions or via aerosols (Wernery and Kaaden, 2002). Scab materials, saliva and secretions of affected camels may shed virus in the environment, such as in water which becomes then the source of infection (Khalafalla and Ali, 2007). The virus can survive on the dry skin scabs for a period of 4-5 months, but it susceptible to heat, direct sun light, acids, alkali and potassium permanganate. The camel pox is well known diseases since ancient times .Some researchers pointed out to the possibility of transmission of infection to humans, so it is one of the zoonotic diseases among the camels and humans as it can infect the human in contact with infected camels. The virus has gained attention from researchers due to its recent emergence with close genetic relatedness to variola virus, the causative agent of smallpox, and carrying genes responsible for host immune evasion mechanisms (Bhanuprakash *et al.,* 2010; Bera *et al*., 2011). In a report on an epidemic of the disease in the north of Kenya found that the disease moved to humans by drinking of contaminated milk from infected she camels with camelpox, which appeared in the form of sores in the mouth and lip (Al-ani & Al-salihy 1988). In Iraq, Al-Falluji *et al.,* (1979) isolated camel pox virus from camel pox-like lesions. The outbreak occurred in 1977 in an area near the Iraqi-Iranian border. The virus was identified serologically as a virus of the Orthopoxvirus group. The biological properties of the isolate indicated that it was probably identical with strains of camelpox virus isolated from Iran, Egypt, Kenya and the U.S.S.R. The recurrent incidence of camelpox occurred in Iraq, however, review of literature revealed scarce reports. Consequence, this article intended to document the case history, epidemics and the diagnostic clinical symptoms of camel pox outbreaks in different areas in Dhi- Qar governorate / Iraq.

Methods and Materials

This study was conducted on the diseased camels in the Dhi Qar province in Batha region, Alfager region and Alnaser area at May-June 2001, July 2007 and May- June 2013 respectively. The disease was observed on 42 camels that suffer from a skin disease (15, 22 5 animals in 2001, 2007 and 2013 respectively). The infected animals were examined clinically. All clinical parameters (temperature, pulse, respiration) were recorded. Skin lesions were examined carefully and the locations of the lesions were also reported.

Results

Clinical examination of the infected herds during epidemics in 2001, 2007 and 2013 showed that not all camels in the herd were showed the clinical signs of camel pox. The infected animals revealed following symptoms: high temperature (39.6 - 40 ^{0}C), increase in heart rate (60-80 / min) and respiratory rate, lack of appetite or stop eating and ataxia (the infected animals were unable to stand). All sick animals revealed typical skin lesions (papules or vesicles, blisters diameter 0.5-1.5 cm, sores and scars). These lesions were observed in all areas of the body especially skin free of lint. Nodules spread to include the front of the head especially the nostrils and upper lip area and the lower lips which appeared as sagging lips (Figure.1) The lesions spread in some cases and appeared as hemorrhagic nodules in the upper and lower lips, gums, tongue and oral cavity. The lesions were ulcerated and left a red and bleeding areas. The infection of oral cavity occurred and leading to difficulty in swallowing and restriction the animals from eating. Some animals showed distribution of the nodules on the eyelids, udder and legs (Figure. 2). Many lesions were appeared on the joints, causing severe pain and effect on the movement of the animal. In some cases the lesion coalesced together and leaving large ulcerated and hemorrhagic painful swelling areas (Figure. 3). Most of the infected cases appeared to heal after a period ranging from 5-13 days.

Figure.1: Shows the coalesced lesions on the upper lip and tongue
Figure.2: Shows the spread of nodules on the back legs.

Figure. 3. Shows the spread and integration of painful and hemorrhagic nodules on the back legs.

Discussion

Diagnosis of camel pox can be established through clinical signs and lesions that appeared on the skin and mucous membrane (Al-Ani 2004). Typical skin lesions and general systematic signs of camel pox were reported in camels in this study. These typical skin lesions (pox like lesions) and general systematic signs that reported in the camel (*Camelus dromedarius*) in Dhi Qar governorate are compatible with previous observations reported by other researcher (Wilson, 1998). Wilson, (1998) was diagnosed the camel pox in 10 cases in Sudan, in addition to isolation and characterization of this camel pox virus from the infected animals. The clinical signs reported in this study are also agreed with cases that reported in one hump camels in the United Arab Emirates (Pfeffer *et al.,* 1996; Al-Ani & al-salihy 1988; Radostitis *et al*., 2007). In conclusion, this study reported camel pox outbreaks in the Iraqi camel type Judy in Dhi Qar governorate / southern Iraq. The author recommend virus isolation and used the rapid molecular diagnostic test for accurate diagnosis of this important disease.

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