Ring Worm Disease in Cattle

Asaad Khalaf Talal Al-Shuwaili
PhD. Department of internal and Preventive Medicine University of Kerbala/ College of Veterinary Medicine. Karbala, Iraq
E-mail: asaad.kh@uokerbala.edu.iq

Abstract
An investigation Dermatomycosis (Ring worm)disease in cows undertaken is one of the most common skin disease and it occurs more frequently among housed cattle due to frequent contact between animals . The aim of the study diagnosis and isolation fungs and treatment. This was achieved by reporting clinical signs, Histopathological findings, Haematological findings, cultural characteristics of the fungs isolated as well as treatment of the affected cases.8(24 percent) out of 32 examined cows was diagnosed as having the ring worm disease. Organism isolated from these cases was Trichophyton verrucosum .The public health importance of the disease is discussed.
Keywords: Cattle,Fungs,isolation ,hematology.

1. Introduction

Dermatomycosis (Ring worm) in cattle is one of the most common skin diseases and it occurs more frequently among housed cattle due to frequent contact between animals (4).Trichophyton verrucosum is the most common organism causing ring worm infection in cattle (13).
Transmission of the disease from animal to the human in contacts had been reported from different regions of the world (12, 1, and 8). The disease was reported in Iraq by (2) who described different cases of human ring worm caused by the fungs Trichophyton equinum which transmitted from infected horses.
The present study reports the clinic pathological aspect of the disease , the isolation and identification of the causative Dermatophyles and treatment the infected cases.

2. Materials and Methods

There are eight infected cows among thirty two cows present at veterinary college farm. All animals aged between 1-2 years. Skin scraping were taken from the periphery of the lesion and put in sterile test tubes for direct microscopically examination using 10%KoH and cultural examination .Skin biopsies were obtained from the edges of the lesions for Histopathological examination .Blood samples were collected from the jugular vein of the cows before treatment for hematological studies. The affected cows were treated with antifungal drugs.

3. Results

1-Clinical signs

A total number of 32 cows of local breed were examined clinically , six of these cows were showing small rounded lesions(3-5 cm in diameter), hairless and covered with scales,these tiny scales were grey-white in colour raised above the skin .Two of these cows showed large circular inflamed hairless area in various parts of the body. The lesions were found around the head (eyes, cheeks, ears), neck and extended to shoulders, abdomen ,back ,thigh,rump and leg of infected cows. As the infection started to head after treatment , acenter with new hairs growing and thereafter quickly covered the area.

2-Direct microscopical examination of infected material

The skin scraping examined with 10% KoH reveated chains of spores in parallel rows on the outside of the hair shaff (ectothermic).

3-Culture

Materials (hairs and scale) from the periphery of the lesions are inoculated on the surface of potatedextrose agar with tetracycline hydrochloride at 250 mg/liter to the culture medium and on the sabourad dextrose agar with chloramphenicol (500mg/litre) and cyclohexamide (500 mg /liter).The two medium were incubated at 30 C° Fungal growth was obtained at 6-7 days for the first medium and at 10-12 days for the second medium.
The colonies of the fungus are heaped ,deeply folded(Cerebriform)with fine white velvety surface. Microscopically,many Chlamydospores are seen in the hyphae.

4-Histopathological findings

There was hyperkeratosis together with moderate canthosis of the epidermal layer of skin. The upper dermis has moderate inflammatory reaction consisting predominantly of lymphocytes. There were few macrophages with few neutrophils. Diagnosis was given as or sub-acute dermatitis.

5-Haematological findings:

There was slight lymphocytosis observed in the examined animals.However , there were no significant changes in the hematological parameters studied.

doi.org/10.31838/hiv23.03.178 Received: 14.11.22, Revised: 23.12.22, Accepted: 11.01.23.

Table (1) Results of some hematological investigations		
	Haematological values	Mean ±S.D.
1	Hemoglobin (Mg/dl)	12.6±0.8
2	PCV (%)	33.7±1.8
3	Leukocytes(103/cmm)	7.6±1.1
4	Neutrophils(%)	25.3±4.3
5	Lymphocytes(%)	68.2±0.8
6	Monocytes (%)	3.4±1.4
7	Eosinophils (%)	301±1.5

6-Treatment of the infection

The eight affected cows were treated orally with Grisovin tablets; each tablet contains 500mg Griseofulvin. The does used were 10 mg per kilogram body weight (6) with a total dose of 2 gram given orally for 14 days. Washing of the sites of infection with Tincture iodine was continued for the same period. Beside treatment other hygienic precaution were taken like. Isolation of the affected cows, removal of manure and disinfection of stables with isotox (Gamma benzene hexachloride) sprays. All the diseases cows were fully recovered after treatment with both preparations and there were complete disappearance of lesions and new hair growth appeared within 14-30 days post treatment.

4. Discussion

Dermatomycosis (ring worm) is a zoonotic disease which appears to be more common in hot and humid climatic countries (9).There are many sources of infection which may be attributed to one or more of the following :Infected animals, contaminated soils, straw and contaminated utensils and equipment (16) The isolated fangs, T.verrvcosom; is the common cause of ring worm in cattle and it can affect other animals as sheep ,goat , horse and cat (5,6).

This species was similarly found to cause human infections among animal handlers. However, the infectivity for man is much lower than it is for cattle(10,13).It is now clear that there are a number of Zoophilic Dermatophytes species as Microsporum canis , Microsporum gypseum, Trichophyton mentagrophytes, T.gallinae, T.equinum and T.quinck eaneum known to cause ring worm infection in man (7,5).

The clinical signs of the disease as well as the mycological characters of the isolates cerebriform in agreement with those given by the literature (13, 9). Histopathological features of the affected skin are similar to the result given by (14).The slight lymphocytosis observed during hematological examination (table 1) could be due to the immunity which developed against the infection (3).

The treatment with Grisofulvin at a dose of 10mg/kg body weight daily for 14 days proved very effective because of the clinical recovery of all cases of ring worm infection and the appearance of hair after 14-30 days.

In general, farmers, veterinary practitioners and members of family rearing infected animals (cows, horses, dogs and cats) are commonly subjected to ring worm infection (11). There are a number of hygienic precaution should be taken concerning the general health of animals and human being and among these precautions are, early diagnosis of disease ,isolation of infected cases , efficient treatment of disease and disinfection of equipment , objects and area which the animal may have come in contact(15).

References

1-Malcolm D., David W. (2012) Fungal Infection: Diagnosis and Management, 4th Edition, Wiley-Blackwell.

2-Smith J.M.B. & Griffi n J.F.T. (1995) Strategies for the development of a vaccine against ringworm, Journal of Medical and Veterinary Mycology, 33:2, 87-91, DOI: 10.1080/02681219580000201.

3-Al-Ani,F.and Younes,A. and Al-Rawashedeh (2002) Ringworm infection in Cattle and horses in Jordan ,Acta Vet.Brno, Vol:71 : 55-60.

4-Nweze, Emeka & Eke, Ifeanyichukwu. (2015). Dermatophytosis in northern Africa. Mycoses. 59. 10.1111/myc.12447.

5-Blank F. Ringworm of Cattle Due to Trichophyton Discoides and its Transmission to Man. Can J Comp Med Vet Sci. 1953 Jun;17(6):277-81. PMID: 17648643; PMCID: PMC1791591.

6-Guo, Y., Ge, S., Luo, H. et al. (2020) Occurrence of Trichophyton verrucosum in cattle in the Ningxia Hui autonomous region, China. BMC Vet Res 16, 187. https://doi.org/10.1186/s12917-020-02403-6.

7-Indranil Samanta(2015) Veterinary Mycology, https://doi.org/10.1007/978-81-322-2280-4.India.

8-Hubálek Z. (2003) Emerging human infectious diseases: anthroponoses, zoonoses, and sapronoses. Emerg Infect Dis.;9(3):403-4. doi: 10.3201/eid0903.020208. PMID: 12643844; PMCID: PMC2958532.

9-Masako Kawasak (2011) Verification of a Taxonomy of Dermatophytes Based on Mating Results and Phylogenetic Analyses, Medical Mycology Journal, Volume 52 Issue 4 PP: 291-295.

10-Radostitis,O.M., Gay C., Hinchcliff,W.and Constable,P.(2015). Veterinary Medicine, textbook of the disease of cattle ,Sheep, Pig and Goats.,10th edition, Sauders Elsevier.

11-Rook AJ, Frain-Bell W. Cattle ringworm. Br Med J. 1954 Nov 20;2(4898):1198-200. doi: 10.1136/bmj.2.4898.1198. PMID: 13209080; PMCID: PMC2080123.

12-Degreef, H. (2008). Clinical Forms of Dermatophytosis (Ringworm Infection).

Mycopathologia 166, 257–265 https://doi.org/10.1007/s11046-008-9101-8.

13-Bhatia, V.K., Sharma, P.C. (2014) Epidemiological studies on Dermatophytosis in human patients in Himachal Pradesh, India. SpringerPlus 3, 134 https://doi.org/10.1186/2193-1801-3-134.

14-Kumar R.,Khurana R. and Narang G.(2010) Histopathology of dermatophytosis in cattle calves, Indian journals.com ,34 Issue:1 , PP:9-11.

15-Clemens Lamberth (2022) Latest Research Trends in Agrochemical Fungicides: Any Learnings for Pharmaceutical Antifungals?. ACS Medicinal Chemistry Letters, 13 (6) , 895-903. https://doi.org/10.1021/acsmedchemlett.2c00113

16-Patrícia Cerqueira, Ana Cunha, Cristina Almeida,Aguiar,(2022) Potential of propolis antifungal activity for clinical applications, Journal of Applied Microbiology, Volume 133, Issue 3, Pages 1207–1228, https://doi.org/10.1111/jam.15628