

The existence and present situation of Clostridial diseases of domestic animals in Iran (* *)

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The presence of clostridial infections among sheep and goats in Iran was reported first in 1936 during an outbreak of blackleg in cattle and then during an outbreak of enterotoxemia among the imported Merino sheep near Teheran, Kaveh (1). Further studies indicated that the infections were widespread all over the country and had been the cause of a very heavy losses for years.

The infections, however have received more consideration since 1950, when the presence and distribution of each type of the clostridial infections were investigated, Rafyi et Ardehali (2). So far, the existence of lamb dysentery, pulpy kidney, black disease, malignant oedema and blackleg are diagnosed in different parts of the country. The present situation of each clostridial infection in Iran is briefly described in this communication.

I - LAMB DYSENTERY (*Clostridium perfringens* type B)

The disease has been reported in new - born lambs. The first manifestation in the chronic and mild cases is abdominal pain and haemorrhagic dysentery. The feces is semi - fluid and brownish in colour. In the acute cases the animals die quickly within twelve hours after infection. The mortality is usually between 40% to 100%. The lesions observed at post mortem examination were intensive haemorrhagic enteritis with gas in small intestine, but in mild cases the necrotic patches up to two or three inches long were only seen.

Isolation and identification of the causal organism and demonstration of its specific toxin has been used for confirmation of the field diagnosis at Razi Institute according to the method described by STERNE and BATTY (3). Several strains of the classical clostridium perfringens type B has so far been isolated and identified from cases of lamb dysentery in Iran (4).

* * Reprinted from O.I.E. proceeding of the 4th International Symposium on animal diseased caused by Anaerobes, P. 65 1982.

II – HAEMORRHAGIC ENTERITIS OF SHEEP AND GOATS IN IRAN (Clostridium perfringens variant type B)

Haemorrhagic enteritis is an acute and fatal disease of adult sheep and goats in this country. The disease is often seen in spring and autumn. The affected animals are in good condition and in the majority of cases they are found dead. In autopsy, usually the small intestine is congested and inflamed, sometime it is completely red. There are some serious exudate in abdominal cavity and pericardial sac, rumen is full of alimentary materials. Thirteen strains of Clostridium perfringens variant type B has so far been isolated from haemorrhagic enteritis of goats and sheep in Iran. The strains of Cl. perfringens type B isolated in Iran were found to be different from the classical type B strains in their production of kappa toxin and non production of lambda toxin and hyaluronidase (5).

III – STRUCK (Clostridium perfringens type C)

Not until 1972 was any case of enterotoxemia infection caused by Cl. perfringens type C in sheep encountered in this country. However, a few have been diagnosed and the causal agent had been isolated from the infected sheep. According to the official reports submitted by the Veterinary Services, the infected animals were reluctant to move and when they tried, convulsive movements stopped them from moving and death followed within a few hours. Acute haemorrhagic enteritis associated with necrosis was observed in the jejunum and ileum on post mortem examination and haemorrhage was found on the epicardium and thymus.

Until now seven strains of Cl. perfringens type C have been isolated from the intestinal contents of sheep and goats, four from adult sheep, two from a kid and one from a goat.

IV – ENTEROTOXEMIA OF PIGLETS (Clostridium perfringens type C)

A severe outbreak of necrotic enteritis in neonatal piglets occurred for the first time in Iran in 1971 (6). It was responsible for a heavy mortality. A flock of 900 out of 1300 piglets died during the outbreak.

Diagnosis was made based on the lesion, clinical symptoms, histopathological, bacteriological, specific toxin production and it was concluded that the outbreak was due to Cl. perfringens type C. Isolation of Cl. perfringens type C from the rectum of healthy sow and from the litter indicated that the piglets were born healthy but obtained the infection immediately after birth either from mother or contaminated litter.

V – ENTEROTOXEMIA (PULPY KIDNEY) (*Clostridium perfringens* type D)

This is an acute and fatal disease of lambs and adult sheep in Iran. Affected animals appeared to be in good body condition and never seem ill for more than one hour. At autopsy, the significant lesions are found in the pleural cavity which contains an excess amounts of semi – solid straw – coloured fluids. The kidneys become pulpy and soft after death due to the action of epsilon toxin. The small and large intestine may be slightly congested and full of gas. The contents of intestine are thick and creamy. The urine contains large amounts of sugar.

The detection of epsilon toxin in the intestinal contents and isolation of *Clostridium perfringens* type D have been used to diagnose the disease. Up to the present time 400 strains of toxigenic *Cl. perfringens* type D have been isolated from cases of enterotoxemia in sheep and goats at the Razi Institute (3).

VI – BLACK DISEASE (*Clostridium oedematiens* type B)

It is an acute and fatal disease of sheep occurring in some parts of Iran. Sporadic outbreaks of black disease have been observed in some areas where the animals are affected with fluke infestation, and also presence of *Cl. oedematiens* type B in the soil and in the livers of normal sheep (7). The majority of cases were found to be associated with immature forms of *Fasciola hepatica*, *Fasciola gigantica* and *Dicrocoelium lanceolatum*.

The disease occurs in autumn and winter and mostly affects adult sheep. Affected animals die without showing any significant symptoms. In the post mortem examination, the subcutaneous blood vessels are found to be highly engorged. The liver shows one or more grayishyellow necrotic areas of 10 – 25 mm diameter surrounded by a well – defined zone of congestion. These are often under capsule of the liver, but sometimes they are deep seated in the liver and can be detected only by incising the liver. In most cases, the liver shows fluke migration. A varying amount of straw – coloured fluid in the pleural and abdominal cavities, gelatinous fluid in the pericardial sac, haemorrhages on epicardium and endocardium are observed. Fluorescent labelled antibodies have also been used for the identification of *Cl. oedematiens* (8). Smears directly taken from necrotic area of the suspected liver lesions and stained by specific fluorescent labelled *Cl. oedematiens* antiserum* showed the organisms brightly and are distinguishable by optical system. For the confirmation of diagnosis, isolation of the causative agent is used as the most reliable means. Due to the strict and fastidious anaerobic nature, isolation of *Cl. oedematiens* from the pathological materials may not be always easy, twenty seven strains of *Cl. oedematiens* type B have been isolated from affected animals at Razi Institute, and studied by Ardehali and Darakhshan (13).

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VII – BRAXY (*Clostridium septicum*)

Braxy, a fatal disease of sheep caused by *Clostridium septicum*, is occasionally observed in Iran following the appearance of frost on the pasture during the winter (times). The sudden death and presence of intense area of inflammation and necrosis in the mucous membrane of abomasum and intestine and existence of semi – gelatinous exudate in pericardium are seen in almost all cases.

VIII – MALIGNANT OEDEMA (*Clostridium septicum*)

Different anaerobic bacteria such as *Cl. perfringens* type A, *Cl. oedematiens* type A and *Cl. histolyticum* were found to be the causal agents of malignant oedema of animals. The disease in cattle caused by *Cl. septicum* has been observed and studied in Iran. Several strains of *Cl. septicum* have been isolated and characterized from cases of malignant oedema of cattle in Iran (10).

IX – BLACKLEG (*Clostridium chauvoei*)

Blackleg in cattle has been recognised in Iran since 1938. (1). Blackleg is generally known to affect cattle in enzootic form, but Blackleg is generally known to affect cattle in enzootic form, but in august 1968 a severe and extensive outbreak occurred in a vast area among 15 villages (11). The affected animals stop eating with high temperature up to 14° C. The affected muscles in the neck, thighs, shoulders or legs are hot and swollen, gaseous and painful under the skin. The affected muscles become oedematous and when touched crepitus is felt under the fingers. The surrounding tissues contain a great deal of blood – stained fluid which escapes through the skin. The diseased animals die within 24 – 30 hours. The characteristic post mortem finding is the extensive lesion in the affected muscles with an intensive oedema, black coloured dry crepitant with bubbles of gas. The thoracic and peritoneal cavities contain bloodtinged fluid which may also be present in pericardial sac.

Thirty strains of *clostridium chauvoei* have so far been isolated from carcasses and specimens received from Veterinary Services for confirmation of provisional diagnosis.

The fluorescent labelled antibodies technique is used as a routine for detection of *Cl. chauvoei* from pathological material. This technique is very valuable for differentiation between *Clostridium septicum* and *Clostridium chauvoei* of decomposed materials (12).

X – TETANUS (*Clostridium tetani*)

Tetanus is an infectious disease of horses, cattle, sheep, goats and dogs in Iran. Up to the present time, no specimen or carcasse has been submitted to the Razi Institute for diagnosis of tetanus.

XI – PREVENTION OF CLOSTRIDIAL INFECTIONS IN IRAN

A large scale production of monovalent and polyvalent clostridial vaccines have been prepared against lamb dysentery, struck enterotoxemia, braxy, black disease and blackleg at the Razi Institute (13).

In 1981, the Razi Institute delivered 30 million doses of clostridial vaccines to the Veterinary Organization of Iran. In 1982 the demand of clostridial vaccines is increasing to 45 million doses.

SUMMARY

THE EXISTENCE AND PRESENT SITUATION OF CLOSTRIDIAL DISEASES OF DOMESTIC ANIMALS IN IRAN

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The presence of several clostridial infections among cattle, sheep and goats have been reported in Iran. Lamb dysentery, haemorrhagic enteritis, pulpy kidney, black disease, braxy, malignant oedema and blackleg were found to be of more significant and cause very heavy economical losses in this country.

The distribution of these diseases with emphasis on the clinical signs, post mortem findings and diagnosis procedures were briefly described in this communication.

RESUME

L'EXISTENCE ET LA SITUATION ACTUELLE DES MALADIES CLOSTRIDIALES CHEZ LES ANIMAUX DOMESTIQUES EN IRAN

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Plusieurs infections clostridiales affectent les bovins, les ovins et les caprins du cheptel iranien. Elles ont déjà fait l'objet de nombreux rapports.

La dysenterie des agneaux, l'entérite hémorragique, l'entérotoxémie, l'hépatite nécrosante, le bradsot, l'oedème malin et le charbon symptomatique sont les maladies les plus importantes, par les lourdes pertes économiques qu'elles entraînent pour l'Iran.

Les auteurs décrivent de façon succincte ces infections clostridiales (tableau clinique et lésionnel, mortalité, etc..) et rappellent les méthodes de diagnostic mises en oeuvre pour les identifier.

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