CONTENT

SUMMARY

The present investigation was performed on 105 samples from different sheep farms during a period extended from January 1997 to December 1999.

The present study including two parts: First study the natural brain lesions due to parasitic and bacterial affections of 5000 sheep at Kafer El-Shiek, Alexandria, Esmaillia and Cairo Governorates. The second parts include experimental study of 5 sheep (6-8 months old age) out of them one control inject S/C by neutral phosphate saline and *Listeria monocytogenes*.

The present study revealed that the incidence of brain affections among examined sheep was 2.1% according to the causative agents, these affections classified into parasitic affections (1.46%) and bacterial affections (0.64%). The parasitic affections including coenuriasis (0.7/%), *Oestrus ovis* affection (0.6%) and sarcocystosis (0.16%). While the bacterial affections including specific bacterial infections (listeriosis 0.28%) and non specific bacterial infections such as staphylococcosis (0.36%).

In **Coenuriasis**, the affected animals suffered from uni or bilateral blindness, recumbency and complete paralysis. Macroscopically, one or more parasitic cysts were embedded in the brain. These cysts were mostly live contained clear fluid with many scolices and enclosed with translucent wall. Microscopically, the live cysts were formed from outer thick connective tissue layer and inner germinating layer with many scolices. Congestion, haemorrhage and mononuclear inflammatory cells with few

eosinophils around the cysts were noticed. In addition, the dead cysts represented by focal central necrosis with dystrophic calcification surrounded with inflammatory reaction. Perivascular mononuclear inflammatory cellular aggregation and necrosis of purkinjie cells were found. Gliosis and neural degeneration were recorded. The meninges showed congestion, edema and fibrous connective tissue proliferation with melanosis.

In cases of *Oestrus ovis* infections, the examined animals were emaciated and rub their noses to the ground or the adjacent animals. Macroscopically, one or more *Oestrus ovis* larvae attached to the brain surface and nasal cavities was noticed. Congestion and red spots on the brain surface were grossly found.

Microscopically, Congestion, perivascular haemorrhages, edema, encephalomalacia, focal and perivascular mononuclear cellular aggregation were detected. Thickening of the meninges due to fibrosis with degeneration of neurons were also detected. In sarcocystosis, microscopically, the cysts appeared oval in shape and filled with basophilic granules without any inflammatory reaction in the adjacent brain tissue.

In the bacterial group, the **natural listeriosis** characterized by dullness of the affected animals with some nervous signs including moving in circle, paralysis and recumbency. Diarrhoea was also detected. Macroscopically, congestion and thickening of the meninges was noticed. Grayish foci of softening were found in the cut section of the brain over the

cerebellum and medulla oblongata.

Microscopically, meningoencephalitis manifested by congestion, perivascular mononuclear cellular infiltration, focal polymorphnuclear cellular aggregation and degeneration of the neurons were detected. Microscopical brain abscesses composed of necrotic tissue infiltrated with inflammatory cells manly neutrophils were noticed. The electron microscopical examination of the brain revealed presence of the microorganism outside the cytoplasm of the nerve cell. In the liver, vacuolation of hepatic cells, congestion and inflammatory cellular infiltration were microscopically also found. The electron microscopic examination of the liver revealed degenerated mitochondria and presence of neutrophils and fat droplets.

In the **experimental listeriosis**, the inoculated mice with natural strain of Listeria monocytogenes which isolated from sheep died after 24-48 h. post-inoculation with tremors and convulsions. Congestion of the brain and enlargement of the liver, spleen and kidney were grossly seen. Microscopic examination of the brain revealed congestion, focal aggregation of bacterial colonies in the brain tissue with perivascular mononuclear cellular aggregation. In the liver, vacuolar degeneration,congestion and inflammatory cellular aggregation of the portal area mainly with lymphocytes, macrophages and few neutrophils were recorded.

The experimentally infected sheep with Listeria monocytogenes suffered from fever which decreased to the normal level after 10 days. The

inoculated sheep showed nervous manifestation at the end of experiment. Macroscopically, generalized congestion with presence of grayish white foci on pale liver and multiple petechae on the cerebellum were found. Microscopically, congestion, haemorrhages, perivascular edema and mononuclear cuffing were noticed. Focal encephalomalacia infiltrated with neutrophils and macrophages with gliosis and neuronal degeneration were found.

The examined liver revealed congestion of the portal vessels, hydropic degeneration and necrosis of hepatocytes. In the kidneys, cystic dilatation of the renal tubules with casts in their lumen was found. The examined spleen revealed depletion of the white pulp. Suppurative pneumonia was recorded in the examined lungs.

In cases of **Staphylococcosis** infection, macroscopically, the brain was congested and showed haemorrhages. Microscopically, congestion, perivascular haemorrhage, recent thrombosis with enecephalomalacia and inflammatory cellular infiltration mostly lymphocytes and neutrophils were found in the cerebral hemisphere.

CONCLUSION

Our results demonestrated that, the main parasitic brain affections in sheep were *Coenurus cerebralis*, *Oestrus ovis* and *Sarcocystosis* with incidence of 0.7%,0.6% and 0.16% respectively. While the main bacterial affections in sheep were listeriosis and *Staphylococcus aureus* infections with incidence0.28% and 0.36% respectively.

Clinically, the affected animals with nervous disease appeared dull, moved with difficulty, with extended head and neck. In addition, uni or bilateral blindness (in case of Coenuriasis), moving in circle (in case of listeriosis), Paralysis and finally complete recumbency of the affected animals.

The gross examination of the affected brains with parasitic disease revealed presence of the parasitic cyst (*Coenurus cerebralis*) or the larvae (*Oestrus ovis*) with congestion of the brain and thickening of the meninges while the affected brain with bacterial disease revealed congestion over the brain surface and presence of grayish gelatinous substance over the cerebellum and medulla oblongata.

The microscopical examination of the brain with parasitic disease showed congestion, presence of the cyst with inflammatory cellular aggregation and haemorrhages while the microscopical examination of the brain affected with bacterial disease revealed congestion, perivascular cuffing, microscopical brain abscess, focal inflammatory cellular aggregation and neuronal degeneration.

It is easy to differentiate between different parasitic agents on the basis of gross and microscopical examination. In contrast, it is difficult to differentiate between different bacterial agents of the brain on the basis of gross and microscopical examination but bacterial isolation was important for the differentiation and also it is easy to differentiate between parasitic and bacterial agents of the brain on the basis of histopathological examination.