PREVALENCE AND PATHOLOGY OF HYDATIDOSIS IN BUFFALO LIVER

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ABSTRACT

The incidence of hydatid cyst and pathological changes in the liver of Indian buffaloes naturally infected with hydatid cyst was observed. The study was conducted on 2119 livers of buffaloes of different sex, breed and age examined at various slaughterhouses located in and around Bikaner (Rajasthan). The incidence of hydatidous was found to be 23.53% (112 hydatidosis/476 liver lesions) The hydatid cysts of variable characters, i.e. variable size; fertile or sterile, intact or collapsed; unilocular or multilocular, located deep or superficially, were observed.

Keywords: buffalo, Echinococcus, hydatid cyst, liver, pathology

INTRODUCTION

Hydatidosis is caused by the larval forms of tapeworm (Echinococcus) of dogs and other carnivores. It poses a significant economic and public health problem in many temperate and tropical areas of the world. The hydatid cyst is more prone to occur in liver and lung than any other visceral organs. Its involvement in hepatobiliary system is both mechanical and toxic depending upon its developmental stage. The presence of large-size hydatid cysts is responsible for substantial economic loss on account of reduced productivity and condemnation of visceral organs and carcasses .

The present study was undertaken to find the incidence of hydatid cyst and pathological changes in the liver of Indian buffaloes naturally infected with hydatid cyst.

MATERIALS AND METHODS

The study was conducted on 2119 liver of buffaloes of different sex, breed and age examined at various slaughterhouses located in and around Bikaner (Rajasthan). Out of these, 476 representative samples showing gross lesions were collected and preserved in 10% buffered normal saline and processed routinely for paraffin embedding. The 4-5 μ thick sections were cut and stained with haematoxyline and eosin (H and E) for detailed histopathological examination; sections from healthy liver were also stained for comparative study (Luna, 1968).

RESULTS AND DISCUSSION

The incidence of hydatidous was found to be 23.53% (112/476); this was comparable to the incidences reported by Dhote et al. (1992) and Cockrill (1994). A few earlier workers like Abraham et al. (1980) have claimed higher incidences of 38% hydatidosis in buffaloes. The probable reasons for variation in incidence can be attributed to unhygienic and poor management, grazing over infected pasture and the presence of large number of stray dogs around the buffalo sheds.

Grossly, hydatid in the liver was recognized by the presence of variable sized typical cysts protruding on the surface (Figure 1). The cysts were unilocular and or multilocular. The cysts of varying sizes were also found deep in the liver parenchyma. Cysts were filled with clear watery fluid, and the cut surface of these cysts manifested cavities lined by a smooth membrane which could be shelled out. Numerous cysts of late stages was found embedded at different depths of liver resulting in gross degeneration of surrounding tissues.
enlargement of the organs. At the site mostly very little parenchyma was left in the liver. Such cysts looked like whitish balls embedded beneath the capsule which was partially raised on the surface and felt tense. Mostly such cysts were spherical and well encapsulated.

The fertile and sterile cysts were yellowish grey colored, hard to the touch with yellowish to somewhat pinkish fluid. Whereas, degenerated cyst were hard to the touch with areas of calcification on cut surface. Some of them had gelatinous contents wherein collapsed cyst membrane could be seen.

Microscopically, the lesions were found in the liver depending upon the stage of development and variability of the cysts. Some sections revealed echinococcal scolexes in the capsule with negligible reaction (Figure 2). Such scolexes was also found in the hepatic parenchyma showing slight hemorrhage, leucocyte infiltration and mild hepatocellular degeneration. In most of the cysts, the capsule was thick having from inside out a highly cellular zone rich in mononuclear cells with abundant fibroblasts and an outer thick fibrous zone of concentrically arranged collagen bundles. The cyst wall was formed of an eosinophilic laminated cuticular structure (Figure 3). There was infiltration predominantly with lymphocytes and macrophages, and occasionally neutrophils, eosinophils and giant cells.

Sections from hard and collapsed cysts showed disintegrating parenchyma in between, wherein laminated highly folded elastic hyaline layers with detritus were seen (Figure 4). Occasionally, the cyst was surrounded by thick coat of granulation tissue showing fibrosis, fibroplasia and infiltration of leucocytes along with giant cells. Further arteriosclerotic change was seen in nearby portal tracts. Similar changes were also reported by Motto et al. (1990). In sterile cysts the cellular infiltration was present on both the sides of the connective tissue capsule.

In fertile cysts, there was a thick connective tissue layer, the outer part of which was heavily infiltrated with lymphocytes along with some fibroblasts and eosinophils, while on the inner side there was a structureless hyaline layer followed by the germinal layer. It showed brood capsules containing scolices in the various stages of development along with hooklets. The adjacent parenchyma was markedly congested and showed multiple small haemorrhagic areas containing erythrocytes. The junction between the hepatic parenchyma and the connective tissue capsule of the cyst revealed small numbers of mononuclear cells and lymphocytes. The nearby hepatocytes, particularly in between two cysts, showed engaged sinusoids, collapsed hepatocytes and fibrosis; further, the hepatocytes in the immediate vicinity of cyst wall showed atrophy and were also in accordance with the findings of an earlier worker, Gupta (1983).

The hydatid cysts of variable characters, i.e., variable size; fertile or sterile, intact or collapsed; unilocular or multilocular, located deeply or superficially etc. as observed presently were consistent with Hussain et al. (1992).

Histopathological structures as per the age, stage of development and viability of the cysts, i.e., laminated hyaline layer surrounded by a thick coat of granulation tissue showing fibrosis, fibroplasia, infiltration of leucocytes along with giant cells, lymphocytes, epitheloid cells etc. in sterile and collapsed cysts, corroborated with the of Dhote et al. (1992) and Ahmedullah et al. (2007). Further, the thick fibrous tissue layer findings and infiltration of lymphocytes along with some fibroblasts and eosinophils and the germinal layer with the presence of scolices in various stages of development in viable fertile cyst, were in line with Gupta (1983) Khan and Dhote et al. (1992).

The hepatic paraenchyma adjacent to cysts showing atrophy, variable degeneration and infiltration as noticed in the present study were apparently pressure effects from the developing cyst and is in line with Dhote et al. (1992).
Figure 1. Variable sized typical cysts protruding on the surface of liver.

Figure 2. Microscopic section of liver showing Echinococcal scolex in the capsule. H&E 400X.
Figure 3. Microscopic section of hydatid liver. Note the cyst wall formed of eosinophilic laminated cuticular structure. H&E 400X.

Figure 4. Microscopic section of liver with a hard and collapsed cyst showing disintegrating parenchyma in between. H & E 400X.
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