Pathological Study of Bovine Liver Telangiectasis

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ABSTRACT

Bovine liver telangiectasis is one of the most common liver lesions found in cattle throughout the world. Liver samples from 50 bovines with telangiectasis were examined by light microscopy. They were characterized grossly by single or multiple red-brown foci, generally 1 to 5 mm in diameter, and occasionally larger. They were located on the parietal surface of the lobus dexter or rarely scattered throughout the organ. Microscopically, irregular and cystic dilation of hepatic sinusoids in all over the liver observed; these cystic cavities were full of red blood cells and in some cases fibrins with neutrophil in these cavities were distinguished. In finding of electronic microscope; marked dilation of diss spaces with red blood cells and collagen and moderate sediment of fibrin were observed. This study is the first report on liver telangiectasis in cattle in East Azerbaijan province.

Key words: Bovine, liver, telangiectasis.

Introduction

Bovine liver telangiectasis, a focal dilation and congestion of a group of hepatic sinusoids, is the most common liver lesion in cattle from different countries of the world [3,5,11,16,20,23,24,28]. In fact Telangiectasis is a frequently encountered lesion that leads to economic losses due to the condemnation of the affected parts of the liver in cattle [4,3,13,14]. This lesion causes direct economic losses due to liver condemnation by sanitary inspectors and, in severe cases, due to impairment of liver function, indirect losses related to a decrease in milk yield or meat production [19]. The purpose of this research was to Pathological Study on Bovine Liver Telangiectasis. This is the first study on this subject in East Azerbaijan province area. This report deals with the incidence, and gross and microscopic pathology of telangiectasis of beef cattle slaughtered in Tabriz slaughterhouse.

Material and methods

Liver samples from 50 bovines with hepatic telangiectasis, were taken between 20 to 35 minutes after death at a local slaughterhouse, fixed by immersion in cold 3% glutaraldehyde in 0.1 M phosphate buffer, post-fixed in 1% osmium tetroxide, dehydrated in alcohol, embedded in PolyBed 812 (Polysciences Inc., Warrington, Penn., USA), cut, stained with lead citrate and uranyl acetate, and observed at the light and electron microscope. Also in this study from specific method for staining were used. Of course all processing of this study after taken the livers from Tabriz slaughterhouse in laboratory of pathology in veterinary faculty of Islamic Azad university Tabriz branch was done.

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Results

The findings of present study divided to two parts consist of microscopic and macroscopic. From macroscopic study of hepatic telangiectasis, various numbers of reddish brown depressed spots in surfaces of liver were observed. Most of them ranged from 1 to 5 mm in diameter, while a few reached up to one centimeter. Figure 1 shows the macroscopic photograph of hepatic telangiectasis in cattle.

Fig. 1: Macroscopic photograph of hepatic telangiectasis in cattle.

Microscopically findings were characterized by dilatation of the space of Disse by glycogen extruded from hepatocytes with endothelial rupture and subsequent erosion of the hepatocytes. Also other lesions consist of dilated sinusoids as irregular cavernous vascular spaces and in some areas atrophic hepatocyte. Dilated sinusoids were filled with erythrocytes, and rarely mononuclear cells, neutrophil leucocytes, desquamated hepatocytes, some endothelial cells, and plasma. This finding with hemotoxylin and eosin staining were distinguished. Figure 2 shows the lesions with hemotoxylin and eosin staining.

Fig. 2: Microscopic appearance of cattle liver, arrow shows the dilated space of sinusoid and Disse, also rupture of sinusoidal endothelium with erythrocyte and neutrophil infiltrations (H&E, ×400).

By gomori methamine silver staining increase the sinusoidal base membrane and tortuous pattern of reticulin fibers in perisinusoidal region were observed. The telangiectatic regions were separated from connective capsule by new formed collagen (figure 3).

Fig. 3: Microscopic photograph of hepatic telangiectasis in cattle, arrow shows increase thickness of sinusoidal wall (GM, ×400).

Conclusion:

Hepatic telangiectasis has been reported in many countries, such as the USA, France, Germany, Italy, and Argentina [11,15,17]. The basic lesion of liver telangiectasis consists in a focal dilation and congestion of the hepatic sinusoids. Its etiology is unknown. However, in cattle. It has been associated to several factors such as vascular inflammation of the portal system [2], focal hepatic necrosis [10] and toxic plants [25]. In humans, it has been associated to long term therapy with anabolic steroids [18] and in laboratory animals it has experimentally been produced with B1 aflatoxin [9], vinyl chloride [26], Lasiocarpine [12], experimental inoculations with murine leukemia9Hvirus [6] or in mice transplanted with granulosa cell tumors or interstitial cell tumors [27]. It is recorded that telangiectatic lesions tend to develop either in the top parietal portion of the liver and at the periphery of the liver lobules or in any area of the organ [5,13,14,17,22]. In this study, these lesions were generally located at any site on the parietal surface of the lobus dexter. Gross and microscopic lesions of telangiectasis were similar in all respects to those previously described [1,5,10,21]. The pathogenesis of bovine liver telangiectasis is still unknown and several theories have been proposed. Jensen et al. [12] have proposed that telangiectasis may be produced by occlusion of sinusoids and necrosis of hepatocytes as a consequence of embolism caused by ulcerative lesions of the gastrointestinal tract. They have demonstrated the presence of venopathies associated with liver telangiectasis in animals with spontaneous lesions or experimentally inoculated with Hemophilus somnus, and concluded that the ischemia of hepatocytes was the initial cause of the lesion [12]. Getty [10] has proposed that the primary lesion of bovine liver telangiectasis is an inflammatory focus of hepatic necrosis. Andersen and Hart [1] proposed that hepatic
telangiectasis is due to glycogen accumulation in the sub endothelial region of the sinusoid which distort and destroy the endothelium, allowing the blood to enter the space of Disse, eroding the hepatocytes. Foschi [8] has pointed out that liver compression by tympany or pregnancy can cause vascular compression and telangiectasis. In this study, although most of the telangiectatic lesions were located on the parietal surface of the liver. This study is the first report on liver telangiectasis in cattle in East Azerbaijan province.

Reference
