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Prevalence and pathology of degenerative changes in liver of pig in Rajasthan

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Abstract

A total of 545 samples of pig liver were collected from both organised and unorganised farms in the Rajasthan regions of Bikaner, Jaipur, and Alwar. Out of these, 157 samples with obvious macroscopic lesions underwent further processing for histopathological analysis. Degenerative changes were reported in 34 (26.66 per cent) cases. The occurrence of different type of degenerative changes like cloudy swelling and fatty change was 9.55 per cent and 12.10 per cent respectively.

Keywords: Fatty change, liver, pig, histopathology, degenerative changes

Introduction

The current objective of the pig business is to produce high-quality, lean meat at a reasonable price, which will have a significant impact on the socioeconomic condition of pig producers (Anubrata and Bujarbaruah, 2005) [3]. Financial losses result from the liver's partial or complete condemnation because it is an edible organ (Purohit PK, 2021) [14]. Hepatic lipidosis, often known as fatty liver, is the condition in which the liver has an excessive amount of lipid (triglycerides, which are neutral fat). This happens when the hepatocytes' rate of triglyceride storage outpaces either their activity of physiological breakdown or their rate of release of triglycerides as lipoproteins (Vegad and Katiyar 2004) [15]. Cellular swelling, also known as hydropic change, vacuolar degeneration, or cellular edema, is an immediate, reversible alteration that happens in response to non-fatal wounds. Because the cells cannot keep the ionic and fluid equilibrium, there is an intracytoplasmic deposition of water. It could be widespread or localised, affecting the entire organ (McGavin and Zachary, 2006) [11].

Material and Methods

In the present study, a total number of 545 specimens of the liver of pig of different age groups, sex and breeds were collected from organized and unorganized farms of Bikaner, Jaipur and Alwar districts of Rajasthan. Out of these, 157 samples showing frank macroscopic lesions were used for further histopathological examination. The samples were properly preserved in 10 percent formalin and processed mechanically for paraffin embedding by acetone benzene technique (Lillie, 1965) [10]. Sections of 4–6-micron thickness were cut and stained with haematoxylin and eosin method.

Results and Discussion

Degenerative changes

This condition was recorded in 34 (21.66 per cent) cases. The occurrence of different type of degenerative changes like cloudy swelling and fatty change was 9.55 per cent and 12.10 per cent respectively.

1. Cloudy swelling

This condition was found in 15 (9.55 per cent) cases. Higher occurrence recorded by Mundotiya (2018) as 12.39 per cent. Almost similar occurrence was recorded by Smitha (2003) [16] as 10 per cent. Whereas, lower occurrence was recorded by Agrawal (2006) as 3.40 per cent.

Grossly, the livers were slightly pale, enlarged with rounded edges, friable and the cut surface bulged out slightly on section (Fig.1) and (Fig.2). Almost similar observation was recorded by Estheru (2010) and Mitkari (2016) [4, 12].

Microscopically, the cells were swollen with indistinct membrane and hazy architecture. The cytoplasm was more granular than normal and the sinusoids were also obliterated (Fig.3) and (Fig.4). Almost Similar findings was recorded by Singh (1998) and Estheru (2010) [5].

It might be caused by antsnake venom (Mitkari, 2016) [12] and the effect of isothermal non-ionizing electromagnetic fields (EMFs) on the liver of mice (Khayyat and Abou-Zaid, 2009) [8].

2. Fatty change

In present study, this condition was recorded in 19 (12.10 per cent) cases. Lower occurrence was recorded by Yamini (1999) [22] as 6.09 per cent, Goswami (2002) [6] as 6.28 per cent, Sreevidya (2017) [17] as 0.64 per cent and Mundotiya (2018) as 5.19 per cent.

Grossly, the liver appeared pale and enlarged with rounded borders (Fig.5). The cut surface of liver was bulged with greasy in appearance and droplets of fat were visible on the blade of knife. Liver was soft and doughy in consistency. These findings corresponded well with the earlier reports of Szczech (1973), Jubb *et al.* (1993), Sastry (1983) and Baruah *et al.* (2019) [19, 7, 14, 4].

Microscopically, the liver cells become swollen and contained numerous small clear vacuoles of different sizes mainly found around central vein. The nucleus was pushed towards periphery that gives signet ring appearance (Fig.6) and (Fig.7). There was rupture of adjoining enlarged hepatocytes resulting into fatty cyst (Fig.8). Almost Similar observation were recorded by Singh (1998), Goswami (2002), Shankar (2011), Anoopraj (2014), Vegad (2015), Sreevidya (2017) and Mundotiya (2018) [6, 15, 2, 20, 17-18].

In present study, it may be due to Aflatoxin (Yang *et al.*, 1988) [23] or helminth infection such as *Schistosoma incognitum* (Agrawal *et al.*, 2001) [1].

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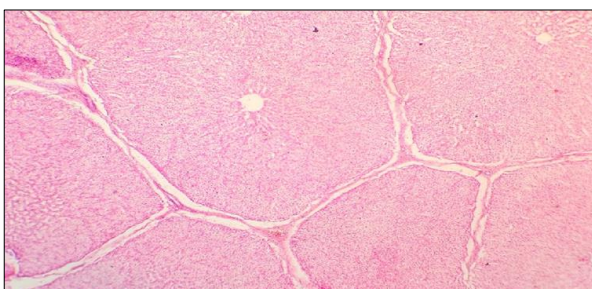


Fig 1: Microphotograph of liver showing cloudy swelling of hepatic cells. (H&E. 40X)

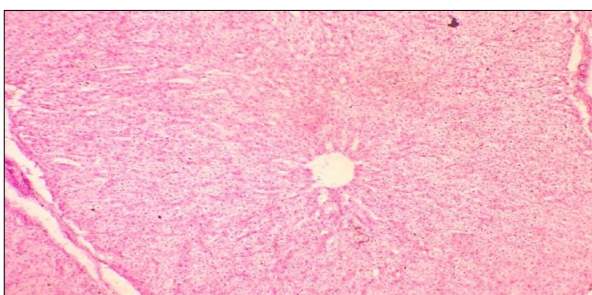


Fig 2: Microphotograph of liver showing higher magnification of

Fig. 32. (H&E. 100X)

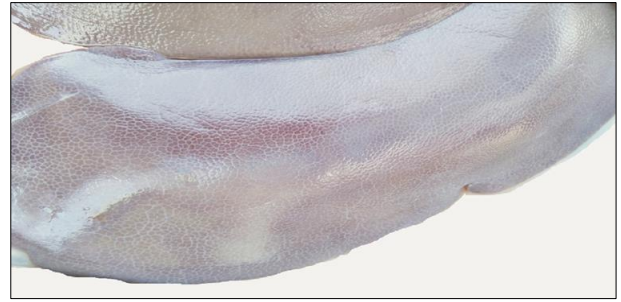


Fig 3: Gross photograph of liver showing slightly pale, enlarged with rounded borders.

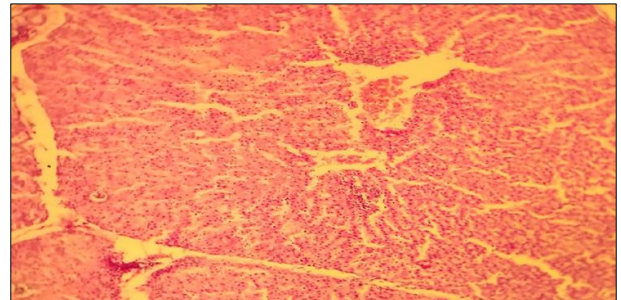


Fig 4: Microphotograph of liver showing fatty change around central vein and congestion in central vein. (H&E. 100X)

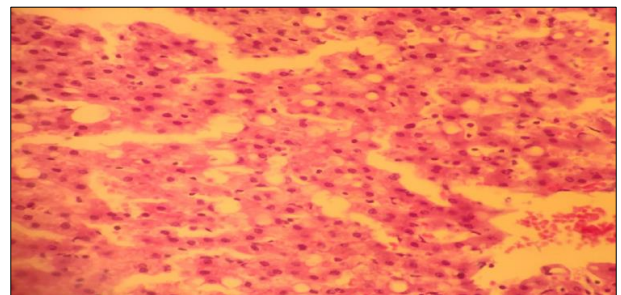


Fig 5: Microphotograph of liver showing higher magnification of Fig 4 (H&E. 400X)

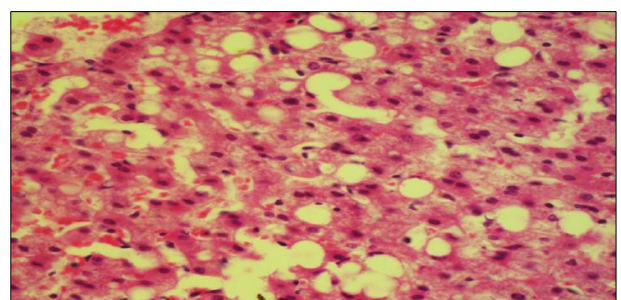


Fig 6: Microphotograph of liver showing fatty cyst. (H & E, 400x)

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