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Pathological findings of degenerative changes in intestine of pig (*Sus scrofa domestica*) of Rajasthan

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Abstract

The present study was done to elucidate the pathological findings of degenerative changes of intestine of pig. A total 380 samples of intestine irrespective of age, sex and breeds were examined. Out of these, 142 specimens of intestine, suspected for abnormalities, were processed for subsequent histopathological examination. An overall incidence of degenerative changes of intestine of pig was observed as 26.76% (38 out of 142). The occurrence of different types of different changes such as atrophy and necrosis were reported as 24.65 and 2.1% respectively.

Keywords: Pig, intestine, degenerative changes, histopathology, atrophy, necrosis

Introduction

Pigs are critical to small-scale farmers and pig farm owners economic stability. Native pigs are thriving and vying for scientist's attention (Singhal, 2019) [25]. Pigs are excellent as Xenotransplantation organ donors, vaccine and drug research models, and have considerable potential as biological models for understanding human developmental processes (Lunney, 2021) [16]. Degenerative changes include atrophy and necrosis occurs due to infection of various bacteria, virus, fungal and parasites. Villous atrophy is characterized by blunt villi, exfoliation of villous surface, and fusion of villi and infiltration of polymorphonuclear and mononuclear cells. Coagulative necrosis is characterized by only architecture persist, cellular detail lost and cytoplasm has no structure (Karanja *et al.*, 2011) [10].

Material and Methods

For the present study, 380 tissue samples of intestine were examined from carcasses of pigs of either sex, irrespective of age groups and breeds during post-mortem examination from January, 2020 to December, 2020. Out of these, 142 samples of intestine showing gross lesions were further processed for histopathological examination. All the representative tissue samples were collected in 10% buffered formalin for histopathological examination. The tissues were processed mechanically for paraffin embedding by acetone and benzene technique (Lillie, 1965) [14]. The tissue sections of 4-5 micron thickness were cut with the help of hand operated microtome and stained as per haematoxylin and eosin staining method (Luna, 1968) [15].

Results and Discussion: The incidence of degenerative changes of intestine of pig in the present study was recorded as 26.76%.

Degenerative Changes of Intestine of Pig

On pathological examination degenerative changes were recorded in 38 cases. The Occurrence of these changes was recorded as 26.76%. Major degenerative change in intestine of pig was atrophy recorded as 24.65%.

1. Atrophy

This condition was found in 35 cases. 24.65%. Almost similar incidence was reported by Kumar *et al.* (2015) [13] in camel and by Poonia (2018) [20] in buffalo. A relatively lower incidence was reported by Asopa (2019) [3] in camel.

Grossly, intestinal wall was reduced in thickness as compared to normal (Fig.1). This finding was in agreement with the earlier findings of Morin *et al.* (1973) [18], Regon and Pathak (2013) [22], Rout and Saikumar (2013) [23] and Meena (2020) [17].

Microscopically, there was atrophied villi and cellular infiltration in mucosa along with congestion in submucosa (Fig.2). In some cases, intestine revealed thinning, desquamation of surface of villi along with infiltration of inflammatory cells (Fig.3). In few cases atrophied, blunt villi, exfoliation of villous surface, fusion of villi and infiltration of polymorphonuclear and mononuclear cells was observed. Almost similar findings were reported by Woode *et al.* (1976) [27], Kim and Chae (2000) [11], Guo *et al.* (2001) [8], Zlotowski *et al.* (2008) [28], Karanja *et al.* (2011) [10], Kongsted *et al.* (2013) [12], Regon and Pathak (2013) [22], Jung *et al.* (2016) [9], Almeida *et al.* (2018) [1] and Asopa (2019) [3].

Atrophy of villi is a common pathological finding next to enteritis (Poonia, 2018) [20]. This condition may be due to viral infection like rota virus (Woode *et al.*, 1976 [27]; Regon and Pathak, 2013 [22]; Rout and Saikumar, 2013 [23]; Almeida *et al.*, 2018) [1], Porcine delta corona virus (Jung *et al.*, 2016) [9] and Porcine epidemic diarrhoea virus B (Kim and Chae 2000) [11], Porcine enteric calicivirus (Guo *et al.*, 2001) [8]. It may be due to bacterial infections such as *Escherichia coli* (Asopa *et al.*, 2015) [4]. It also appears in many helminth infections like *Ascaris suum* infection (Gaurat and Gatne, 2009) [7] and Protozoa infection such as *Isospora* infection (Stuart *et al.*, 1980) [26].

2. Necrosis

This condition was reported in 3 cases. The occurrence of this condition was recorded as 2.11%. Almost similar incidence was reported by Rathi (2020) [21] as 1.44%.

Grossly, necrosed area become dry, homogenous and whitish - grey in colour was in agreement with the findings of Rathi (2020) [21].

Microscopically, there was desquamation and necrosis of villi along with infiltration of lymphocytes in mucosa (Fig.3). In few cases, intestine revealed degenerated and necrosed villi in mucosa. In necrosed area, only architecture persist, cellular detail lost and cytoplasm has no structure. Almost similar findings were reported by Dykstra *et al.* (1993) [6], Penrith *et al.* (1995) [19], Sanchez- Cordon *et al.* (2003) [4], Zlotowski *et al.* (2009) [29] and Karanja *et al.* (2011) [10].

This condition may occur due to *Escherichia coli* (Dykstra *et al.*, 1993 [6]; Penrith *et al.*, 1995 [19]; Asopa, 2012), *Lawsonia intracellularis* (Cooper and Gebhart, 1998) [5], *Salmonella* spp. (Alsop, 2005) [2] and classical swine fever virus (Sanchez- Cordon *et al.*, 2003) [4].

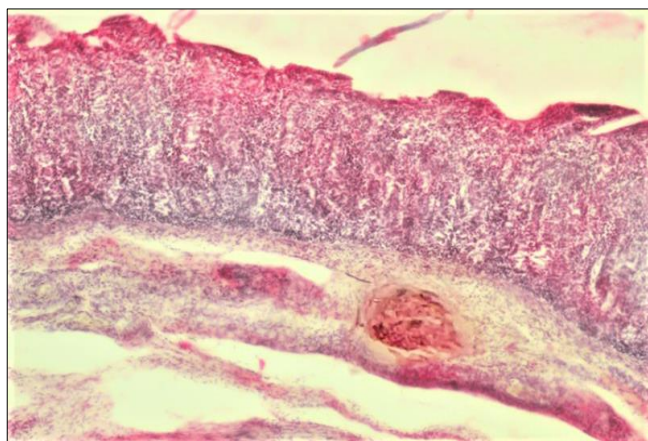


Fig 1: Microphotograph of intestine showing atrophied villi and cellular infiltration in mucosa along with congestion in submucosa. H&E. 100X

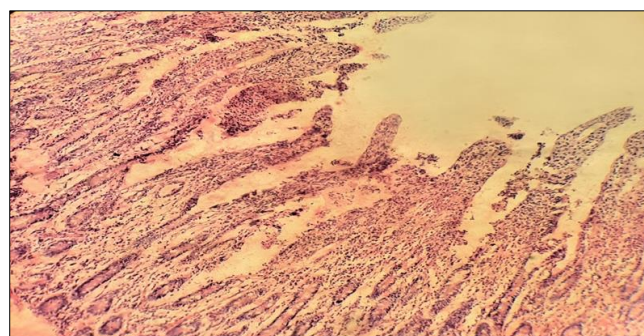


Fig 2: Microphotograph of intestine showing thinning, desquamation of surface of villi along with infiltration of inflammatory cells.H&E.100X

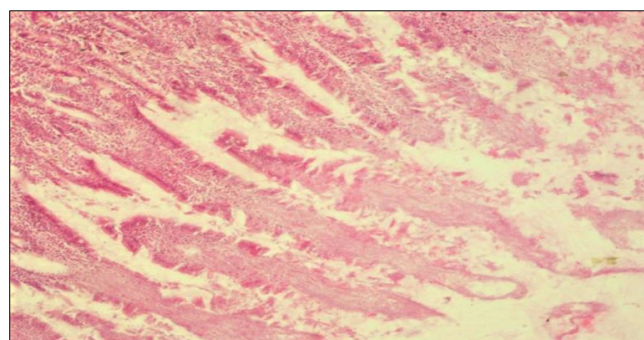


Fig 3: Microphotograph of intestine showing desquamated and necrosed villi along with infiltration of lymphocytes in mucosa.H&E.100X

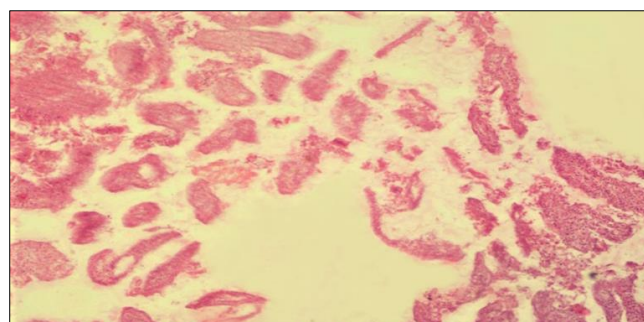


Fig 4: Microphotograph of intestine showing degenerated and necrosed villi in mucosa.H&E.100X

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