Research Article

Pathology of *Choanotenia infundibulum* in the Intestine of Free Range Chickens from Hyderabad, Sindh, Pakistan

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Abstract

An attempt was made to investigate the pathological changes in the intestine of free range scavenging chickens infected with cestodes parasite *Choanotenia infundibulum*. For the purpose 100 birds (*Gallus domesticus*) were randomly purchased from different villages and local markets of district Hyderabad, Pakistan. Chicken were dissected and different parts of intestine were searched. Out of 100 birds 94 (89.5%) were found infested with *Choanotenia infundibulum*. For histopathological examination different parts of infected intestine were fixed in Bouin's fixative for period of 24 hours. Paraffin embedded tissues were cut 5-6 micron thick and stained with hematoxylin and eosin (H&E). Histopathological findings revealed sever damage including distortion, fusion, inflammation and destruction of architecture of muscular layers, villi and glands. It was concluded that high level of parasitic infestation cause severe health problems in birds and this can lead significant losses of poultry production.

Key words: Histopathology, chicken, intestine, *Choanotenia infundibulum*.

Introduction

The Poultry sector plays a vital role in national economy with an essential contributor of revenue by producing animal protein (meat and egg) to humans [1]. Poultry is one of the most important segments to rear the domesticated species and playing enormous role as profitable animal production enterprises [2].

Poultry is one the most organized group of the livestock which is producing an

estimated to number about 14,000 million, consisting mainly of chickens, ducks and turkeys. Approximately 80% of the poultry population is kept as free range poultry [3]. Chickens are generally raised in free range system, scavenging around the compound of house hold, feeding on locally available resources like earth worm, house hold refuse, insects residue from harvest, animal and human faeces etc [4].

Parasitic infestation causes severe health problems; slow growth, low egg production, low weight, anemia and mortality [5]. High parasitism in chicken has been reported from various part of the world [6-8] and also from Pakistan [9-12]. Keeping above in view the present study was designed to assess the parasitic infestation and their hazardous effects on poultry sector. Therefore this study provides guideline and awareness to improve better poultry management for minimizing the parasitic infections.

Material and Methods

Collection of intestine samples

Present study was conducted with the approval of the Advanced Studies and Research Board (ASRB) under the guidelines at Department of Zoology, University of Sindh Jamshoro, Pakistan. For the purpose live birds (*Gallus domesticus*) were collected from different locations of district Hyderabad and brought to the Parasitology Laboratory. After that collected birds were dissected and different parts of intestinal tract were carefully removed. These recovered intestines were examined under disectory microscope for parasitic infestation.

Collection, Staining and Identification of Parasites

The assorted parts of intestinal tract were examined for parasitic infestation by applying the method of Dharejo [13]. Various parasites were recovered from the different parts of infected intestine; jejunum, ileum and duodenum. It is important to relax and kill recovered parasites before fixation, which was done by putting them in saline water 15-30 minutes or by putting 70% alcohol drop by drop. There after killed parasites were potted in 70% alcohol and kept into small glass jars for further process of staining and identification. Preserved parasites were cautiously pressed between two glass slides and these slides were tie

with thread by applying spongy pressure. The tied slides were kept in 70% alcohol for 48 hours. The pressed parasites were passed through graded alcohol series and stained with Borax carmine. Moreover parasites were washed in 70% alcohol and entirely dehydrated with 90% and absolute alcohol. The clove oil was used on the stained slides then cleared in xylol. The specimen permanently mounted in Canada balsam by putting them a glass cover slip.

Results and Discussion

In present studies 100 birds (*Gallus domesticus*) were examined out of which 94(89.5%) were found infected with *Choanotenia infundibulum*. The parasites were identified on the basis of structural characteristics with the help of keys and literature [14, 15]. The incidence of *Choanotenia infundibulum* infection from the chicken (*Gallus domesticus*) previously have been reported throughout world Butt et al., [16] from Pakistan reported 89.5% ; Uho et al., [17] 36.7%; Medjouel et al., [18] 11.8%; Zahrani et al., [19] 12.38%; Radfar et al., [20] 40.67%; Hussien et al., [21] 13.7%; Shahin et al., [22] 40.5%; Eslami et al., [23] 8%.

Histopathological observations of the infected sections of intestine revealed severe tissue damage. Obviously, severity of lesions that aggravate by the parasite in the host tissue mainly depends on the parasite morphology, particularly its composition and size of the attachment organ. In the present findings histology of intestine of control chicken showing complete architecture of villi, muscular layer, crypt glands and lamina propria (Fig.2). Histopathological observations associated with *Choanotenia infundibulum* showed alteration, fusion, swelling and damaged muscular layers, villi and glands (Fig. 3 and 4). The deterioration of the glands was commonly observed. These findings are agreed with Butt et al.,

[24]. The infected intestine of chicken (*Gallus domesticus*) with *Raillietina cesticillus* showed architectural disintegration of villi and crypt glands and this also line with the results of Shaikh et al., [25]. The helminth parasites when they lodge in the inner walls of intestine with the help of their adhesive organs where they cause damage to the villi and also other layers of the intestine [26]. In present experimental study defused crypt glands associated with unidentifiable structure of crypt cells were observed (Fig.5). Their lumen were demonstrated completely congested (Fig.6). The helminthes adversely affects all layers of the intestine in kite (*Milvus Migrus migrus*) [27]. During Histopathological assessments inflammation in cells along with necrosis of the lamina propria was observed at the base of crypts (Fig. 7). These findings were in accordance with the results described by Muti-ur-

Rehman [28] in the intestine of eagle infected with *Medioorhynchus fatimae* reported necrosis, inflammation and hyperplasia of glands. As a result of shrinkage muscular layer has been tear up showing fibers. Similar observations were made by other workers Laxma Reddy and Benarjee [26] who reported degeneration and hyperplasia of intestinal villi, necrosis and vacuolation of muscular mucosa. Sanil et al., [29] reported hyperplasia of intestinal villi, lamina propria, degeneration and necrosis of muscular layer.

Conclusion

This work strongly suggests that free range poultry is susceptible to high risk of parasitic infection and have high economic impact in the poultry production. Therefore, further investigations are needed to elucidate the economic and hygiene impact of parasitic infection on poultry reared in free range backyard system.

Fig. 1

Fig.1. Showing scolex of cestode parasite *Choanotaenia infundibulum* X 100.

Fig. 2

Fig.2. Showing over all non-infected intestine including muscular layer crypt glands and villi X 200

Fig.3-4. Section of infected intestine showing architectural disintegration: distortion, fusion of glands and gaps in the muscular layer X100.

Fig.5-6. Section of infected intestine showing crypts, lumen of the glands is closed. Inflammatory cells are clearly visible X100.

Fig.7. Section of infected intestine showing inflammatory cells throughout the section and at the base of crypts necrosis of the lamina propria is clearly visible X200.

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