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RESEARCH ARTICLE

DISTRIBUTION OF FASCIOLOSIS IN BUFFALOES IN RELATION TO AREA, AGE AND GENDER, IN PUNJAB (PAKISTAN)

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ABSTRACT
To determine the distribution of fasciolosis in buffaloes, a total of 4800 feacal samples were analysed by direct microscopic examination from four different Districts of Punjab Province (Pakistan). Fecal samples examination showed overall prevalence of 17.46% in two years. Highest infection was noted in Gujranwala (18.25%) followed by Lahore (18.08%), Kasur (17.67%) and Sheikhupura (15.83%). All areas have non-significant difference (P>0.05) between their infection. In adult buffaloes (>2years) infection was significantly (P<0.01) higher (15.9%) as compared to young ones (8.82%). Males were found more susceptible (15.43%) than females (14.64%) but statistically there was non-significant difference between infections of both sexes.

*Article is part of PhD Research of Author.

INTRODUCTION

Fasciolosis or liver rot caused by *Fasciola* spp. (mainly *Fasciola gigantica* and *F. hepatica*) is cosmopolitan in distribution. It is normally a disease of bile duct of domestic herbivorous animals such as sheep, cattle and goats, which are the normal hosts (Mulcahy and Dalton, 2001, Cucher et al., 2006; Mehmood et al., 2017). It contributes to great economic and health losses in cattle industry in many countries of the world (Phiri et al., 2005; Mehmood et al., 2017; Barbosa et al., 2019; Opio et al., 2021). On livestock it has both direct effects, actual liver condemnation at slaughter and indirect effects such as decrease in feed efficiency, weight gains, milk production and reproductive performance (Shaikh et al., 2004; Molina et al., 2005; Piri et al., 2018).

The presence of fascioliosis as one of the major problems in cattle raising area of Punjab, Pakistan was first of all reported by Kendall (1954; 1965). Later on, after a long gap, some work was done on animals brought to veterinary hospitals and abattoirs of Punjab to assess the prevalence of this disease (Maqbool et al., 1994, 2002, Khan et al., 2009; Qureshi et al., 2009; Ahmed et al., 2017). Reports were also published from other provinces of Pakistan including Sindh (Bhutto et al., 2012), Baluchistan (Kakar et al., 2011) and KPK (Khan et al., 2020), indicating that fasciolosis is endemic in Pakistan.

In our country buffaloes are of great economic importance, as provide more than 50% of the total milk and meat production. The present study was aimed to conduct study on fascioliosis in buffaloes of selected cattle raising districts of Punjab and find out prevalence of this parasitic disease in relation to area, age and gender. The data thus obtained will facilitate in developing strategy for the prevention and control of fasciolosis in buffaloes in Pakistan.

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MATERIALS AND METHOD

Study area

Study was conducted in 4 agro-ecological Districts of Punjab Province i.e., Lahore, Gujranwala, Kasur and Sheikhupura (Fig 1).

Sample collection

To record the prevalence of fasciolosis in buffaloes, a total of 4800 faecal samples were collected from above mentioned sites from June 2003-June 2005 (Study year 1=June 2003-June 2004 and Study year 2= July 2004 to June 2005). These samples were collected in sterilize plastic jars from rectum of each buffaloes. All samples were labelled with all required information of age, gender and area and stored at 4° C after adding 10% formalin.

Coprological analysis

A small amount (approximately one gram) of each solid faecal material was mixed with 1ml of normal saline and mixed well. A smear was prepared on glass slide of this mixture, covered with cover slip and examined for the presence of *Fasciola* eggs by microscope at 10 and 40X (Urquhart et al., 2000). Faecal samples of liquid consistency were examined without mixing with saline solution. Eggs were identified on the basis of morphology described by Soulsby (1982).

Statistical analysis

Data was analyzed statistically by using Student's t-test and ANOVA through computer software (Microsoft SPSS 10.0).

RESULTS

An overall prevalence of fasciolosis was found 17.46% in selected district of Punjab in two study years.

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Fig 1: Map Showing: A) Punjab province (Green) of Pakistan, (B) study Districts (gray) of Punjab: (a) Gujranwala, (b) Sheikhupura, (c) Lahore and (d) Kasur.

Area wise (%) distribution

Studies in different districts showed a varied degree of infection. The highest mean infection rate was found in Gujranwala (18.25%) followed by Lahore (18.08%), Kasur (17.67%) and lowest in Sheikhupura (15.83%). In both study years more or less same pattern of infection was noted (Fig 2). ANOVA test showed that all areas had non- significant (P=0.055) difference between their infection rates when compared with each other.

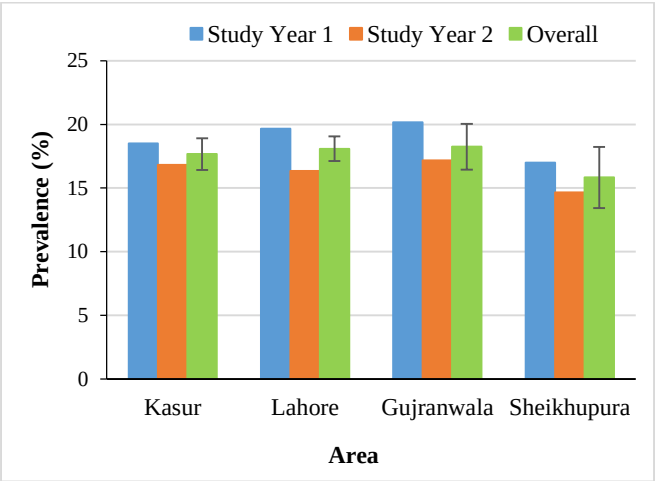

Fig 2: District wise distribution of Fasciolosis in buffaloes of North-East Punjab.

Age wise (%) distribution

It was observed in overall infection that adult animals have significantly (P<0.01) higher infection (15.9%) than young ones (8.82%) as shown in Fig 3.

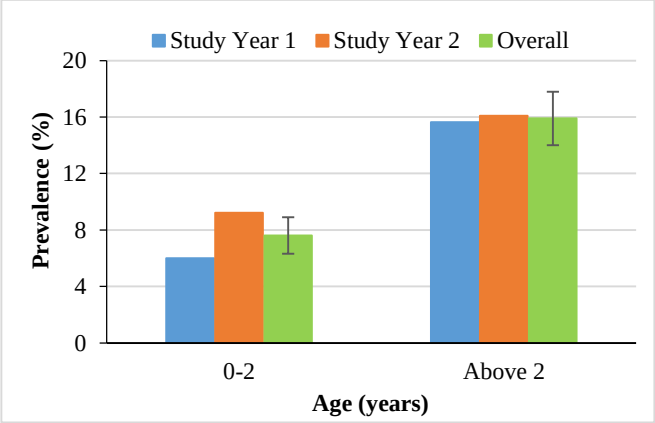

Fig 3: Age wise distribution of Fasciolosis in buffaloes of North-East Punjab

Gender wise (%) distribution

Overall gender wise prevalence showed males (15.43%) were more susceptible than females (13.56%) for fasciolosis. Odds ratio showed males were 1.125 times more at risk than females. Statically difference was not significant (P>0.05) between the infection rates of both sexes (Fig 4).

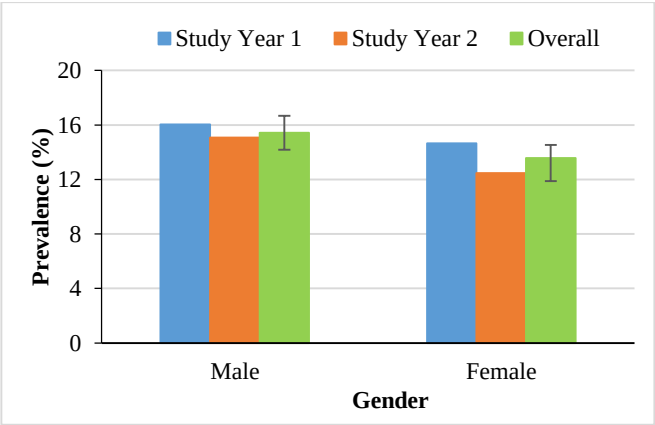

Fig 4: Gender wise distribution of Fasciolosis in buffaloes of North-East Punjab

DISCUSSION

In present study overall infection of fasciolosis in buffaloes was noted as 17. 46% in two years in Punjab province, while highest infection was in Gujranwala and lowest in Sheikhupura. These results are more or less equal to report by Maqbool *et al.* (1994, 2002). But in contrast with Khan et al. (2009), who reported higher bovine fasciolosis (25.46%) from Punjab. This difference may be due to difference in study areas having different climatic conditions and livestock management in specific area (Ahmad et al., 2017). The level of infection in an area was thought to be associated with the extension of the canal system providing additional areas of swamp and marsh where the buffaloes were exposed to infective

larvae of helminthes. Such areas provide habitat for intermediate host and ensure propagation of parasite life cycle (Chaudhri et al., 1993; Maqbool *et al*., 2002 Ahmad et al., 2017).

Although males showed higher infection than females but difference is not significant. Aal et al. (1999) and Maqbool et al. (2002) also reported non-significant difference between infections of both sexes of buffaloes The lower infection in females may be related to their better care for milk production and breeding. Bhutto el al. (2012) and Ahmed et al. (2017) reported significant higher infection in females in buffaloes and small ruminants, respectively. While, Khan et al. (2009) reported no sex-related differences (P>0.05) in prevalence of bovine fasciolosis. The difference in infection depends on the management conditions for animals. Usually females' specially lactating and pregnant buffaloes were kept under better conditions of care than older females and male animals.

The incidence of fasciolosis in respect to the physiological status of buffaloes revealed significantly higher infection rate (P< 0.001) in adult buffaloes than young ones. Maqbool et al. (2002) and Bhutto et al. (2012) also found higher infection in adult buffaloes. Keyyu et al. (2005) and Pfukenyi et al. (2005, 2006) reported same results in cattle of Tanzania and Zambia respectively. It indicated adult animals are more prone to fasciolosis. This may be due to long time exposure of adult animals to infective larvae as compared to young ones. Other reason may be better care of young ones as compared to adult animals. Khan et al. (2009) also reported non-significant difference of infection related to age groups. It indicated that all age groups animals are almost equally susceptible.

This survey indicated that a significantly higher prevalence of fasciolosis in buffaloes of Punjab (Pakistan) which can cause great economic loss. Infected animals can also be considered as contaminating source of environment, especially fresh water bodies, with *Fasciola* eggs. The study showed clearly area, age, gender wise distribution of fasciolosis.

Ethical Statement: For collection of faecal samples from farm and house hold animals, written consent was taken from owners.

Conflict of interest: There is no conflict of interest of current study

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