

EPIDEMIOLOGY OF SCHISTOSOMIASIS IN BUFFALOES UNDER DIFFERENT MANAGEMENTAL CONDITIONS IN FOUR DISTRICT OF PUNJAB, PAKISTAN

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ABSTRACT

The study was conducted to record the prevalence of Schistosomiasis in buffaloes in four districts of the Punjab, i.e., Lahore, Sargodha, Kasur and Sheikhpura. Overall prevalence of Schistosomiasis in different managemental conditions in farms of Punjab province indicated that infection was the highest (17%) in Kasur district followed by Sheikhpura (14.83), then Lahore (14.6%) and the lowest (13.66%) in Sargodha. The highest month wise prevalence was recorded during August (25.5%) followed by July whereas the lowest during December and January. Infection in buffaloes was higher in animals over two years of age (19%) than animals below two years of age (5%) in all the four districts of Punjab. The prevalence was higher in females (15.98%) than male (9.48%). There is variation in the prevalence as there is difference in the environmental and managemental condition of the area.

Key words: Epidemiology, Schistosomiasis, Buffaloes, Punjab, Pakistan.

INTRODUCTION

Schistosomiasis (also known as bilharzia) was first identified by German Pathologist Thoder Bilharz, in Egypt in 1851. Schistosomiasis is second major parasitic problem of the world affecting 200 million people of the world and about 800 million people are at risk to this infestation. It has been estimated that about 500,000 deaths occurred every year due to Schistosomiasis. (Chitsulo *et al.* 2000 and Capron *et al.* 2002). It has been reported that 165 million cattle becomes infected with Schistosomiasis all over the world during neonatal life of the calves. The passive immunity of the calves which they receive by the colostrum in the prenatal and postnatal period reacts for the infection which they receive in the early age through water contact. (Gabriel *et al.* 2002). Transmission of schistosomiasis is mainly based on pollution of water, use of such water for bathing or irrigation and the presence of snails in area. This hazardous malady is caused by variety of species of digenetic trematode parasites of the genus *Schistosoma* which are commonly known as blood flukes. All species of this genus are found in the mesenteries, portal, intestinal, sub-serosal, pancreatic, and sometimes splenic veins and the branches of the pulmonary arteries and also in the nasal mucosal veins of cattle, buffaloes, goats, horses and men (Nithiuthai *et al.* 2004).

The study was designed to investigate certain epidemiological aspects of Schistosomiasis in animals (buffaloes), along with relationship of meteorological factors such as maximum and minimum temperature, relative humidity, rainfall and pan evaporation rate with the occurrence of disease and snail population was also be studied.

MATERIALS AND METHODS

Survey of the animals from livestock farms: To record the prevalence of Schistosomiasis in buffaloes 40 different farms were selected, 10 farms from each four districts of the Punjab, i.e., Lahore, Sargodha, Kasur and Sheikhpura. Faecal samples were collected randomly from 50 animals on the monthly basis throughout the year from each farm.

Parasitological Techniques: Faecal samples were examined by direct smear, Sedimentation and Floation techniques (Soulsby 1982 and Urquhart *et al.* 2001). Eggs were identified on the basis of morphology and key as described by (Yamaguti 1975 and Georgi *et al.* 1999). Counting of eggs was made by Mc Master Egg counting technique (Zajac *et al.*, 2006).

Collection of Faecal Samples: About 10 grams of fresh samples were collected directly from the rectum of the buffaloes or at the time of defecation. These samples were brought to the Postgraduate Laboratory, Department of Parasitology, University of Veterinary and Animal Sciences Lahore. Majority of these samples were examined on the same day while a few which were examined on the other day were preserved in 10% formalin for preventing the development and hatching.

Meteorological data: Information on maximum and minimum temperature, humidity, rainfall and pan-evaporation was collected daily from the meteorological records of Lahore and Sargodha. The monthly averages for each weather factor were collected.

Statistical Analysis: The results from four districts of the Punjab province were statistically analyzed by the chi square method

RESULTS AND DISCUSSION

Overall prevalence of Schistosomiasis in buffaloes in all the four districts of Punjab province i.e., Lahore, Sargodha, Kasur and Sheikhpura indicated that infection was the highest (17%) at Kasur followed by Sheikhpura (14.83), then Lahore (14.6%) and the lowest (13.66%) at Sargodha ($p=0.0001$). The highest month wise prevalence was recorded during August (25.5%) followed by July and the lowest during December and January. The lowest prevalence was recorded in all these districts during the months of January and December. It was noted that in all the four districts infection was higher in animals over two years of age than below two years ($p=0.00001$). Similarly prevalence was higher in females than males ($p=0.002$) in all four districts of Punjab. The presence of schistosomiasis and difference in their prevalence was influenced by the local climatic conditions, presence or absence of water reservoirs, lakes, rivers and availability of suitable hosts. (Maqbool *et al.* 2003, Cameron *et al.* 2004, Narcis *et al.* 2004, Jesus *et al.* 2004 and Langeler *et al.* 2004). It was reported that infection in buffaloes was the highest (20.7%) during summer declining in autumn (17.5%), followed by spring (11.5%) whereas, the lowest in winter (10.12). These findings are closely related to those of (Misra *et al.* 1997, Georgi *et al.* 1999 and Fabiana *et al.* 2002). (Irshad 1998) examined total 200 fecal samples of these 32% were positive for schistosomiasis.

Seasonal reproduction in schistosomes species showed marked seasonality in egg production, with peak activity during the monsoon and post monsoon months. Chaudhri *et al.* (1993), Irshad (1998) and Georgi *et al.* (1999) also reported similar results. The highest (24%) prevalence in buffaloes was recorded in the month of August while the lowest (6.8%) during December and January. The findings agreed with the reports of Asif *et al.* 2007. These results differ with those of (Keyyu *et al.* 2006) who reported 75.2% prevalence in adults and 47.2% in younger. The prevalence of infection, number of lesion and severity of lesions increased with advancement of age of cattle as was also reported by (Glasser 1995) reported that there is also chance of schistosoma infection in adult associated with such professional activities as rice cultivation areas.

Overall prevalence of schistosomiasis in clinically affected buffaloes in different districts of Punjab province showed that it was the highest at Kasur followed by Sheikhpura than Lahore and the lowest at Sargodha. Gill, 1985 reported 26.87% prevalence in poorly drained areas and in the present study 18.54% and 11.60% in well drained areas of Lahore and Kasur.

Around Kasur there were enough marshy areas which favor the development of snails (Tanveer 1989, 1990, 1992 and Irshad 1998) also reported that incidence of schistosomiasis was high in flooded pasture than plain. Yapi *et al.* (2004, 2005) reported that irrigation canals increased the incidence.

In the study it was reported that infection was higher (15 to 18%) in females than males (7-12%). The reason seems to be related to special practice of keeping females under better management and feeding condition in comparison to males which are generally let lose to graze freely in pastures. Chaudhri *et al.* (1993) found the same results. Hillyer, *et al.* 1999 reported similar results in which the infection of female with a Schistosomiasis was 2 times more than that in males. Asif *et al.* (2007) observed higher prevalence in males than females in buffaloes. These results contradict with the observations who observed that female cattle were significantly more affected than males in France.

When the data on the monthly and seasonal prevalence of Schistosomiasis were analyzed, it was observed that higher incidence of Schistosomiasis occurred in the month of August. Appleton (1978 and William (2001) also reported that the two important factors influencing the incidence of Schistosomiasis are adequate temperature and moisture in the environment, which helped the hatching of fluke eggs, the availability of cercariae and population of the snails. Pfukeni *et al.* (2005 and Stensgaard *et al.* (2006) also reported similar findings.

Table1: Prevalence of Schistosomiasis in Buffaloes in four Districts of Punjab Province

Parameters	No.	No.	% age	
	Examined	Infected	of Infection	
Months	Dec-05	200	18	9
	Jan-06	200	18	9
	Feb	200	21	10
	March	200	22	11
	April	200	24	12
	May	200	27	13.5
	June	200	40	20
	July	200	46	23
	August	200	51	25.5
	Sep	200	38	19
	Oct	200	32	16
	Nov	200	24	12
Seasons	Winter	800	81	10.12
	Spring	400	46	11.5
	Summer	800	164	20.5
	Autumn	400	70	17.5
Sex	Male	348	33	9.48
	Female	2052	328	15.98
Age	< 2 years	590	30	5
	> 2 Years	1810	331	19.22
Overall		2400	361	15.19

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