International Journal of Science and Business

An Epidemiological Investigation the Outbreak of Stephanofilariasis in Kanaighat Upazila, Sylhet, Bangladesh

Foyez Ahmed, Prantho Malakar Dipta, Md. Saidul Haque, Iffat Ara & Chamali Akter Shykat

Abstract:

Parasitic diseases in domestic animals are common in Bangladesh. Filarial worm *Stephanofilarial assamensis* is the causal agent of Humpsore and it is transmitted by a vector (fly) named *Musca conducens*. The study was directed to find out the occurrence of Humpsore in cattle population in Kanaighat Upazila of Sylhet, Bangladesh. The study began from November 2016 to October 2017. In this period, a total of 7702 cattle were brought to the Kanaighat Upazila veterinary hospital and examined. From the total, 99 cattle were found to be clinically affected with Humpsore. The disease was diagnosed on the basis of owner complaint, clinical signs, physical signs and gross examination of the lesion. In this study the overall prevalence was (1.28%) and disease prevalent more in adult cattle. The outbreak of diseases occurs throughout the year but the maximum prevalence was found in May (2.93%). Disease prevalence mostly found in male than female. The disease prevalence in male was

Foyez Ahmed, (Corresponding author) DVM, MS Student, Department of Parasitology. Sylhet Agricultural University, Bangladesh.

Prantho Malakar Dipta, DVM, MS Student, Department of Pathology. Sylhet Agricultural University, Bangladesh.

Md. Saidul Haque, DVM, MS Student, Department of Pharmacology. Sylhet Agricultural University, Bangladesh.

Iffat Ara, DVM, MS Student, Department of Pathology. Sylhet Agricultural University, Bangladesh.

Chamali Akter Shykat, DVM, MS Student, Department of Parasitology. Sylhet Agricultural University, Bangladesh.

(1.75%) and in female (0.76%). In this research, the highest prevalence (2.06%) was found in the age group of over 5 years. The velocity of infection grown with the increase of the age of the animals. According to seasonal influence, a maximal disease outbreak in rainy season and prevalence was (2.37%) and lowest prevalence found in the winter season and it was (0.69%). P-value (P<0.05) was considered as level of significant.

Key words: Cattle, Dermatitis, Humpsore, Prevalence, *Stephanofilarial assamensis.*

1. Introduction:

Bangladesh is a populous developing country and most people depend on agriculture for their livelihood. Livestock are an important element of developing agricultural-economically-based countries, like Bangladesh. Domestic animals play a momentous role in developing countries. Livestock is mainly used for draft strength and skin (leather) and it provides fertilizer, meat, and milk among most people of Bangladesh (Banglapedia, 2015). The current contribution of livestock GDP is approximately 1.60% and GDP growth rate is 3.32% (DLS 2017). At present, the livestock population and GDP decreases due to climate change and the rate of disease increases. Infestation of the skin of cattle by a nematode namely *Stephanofilarial assamensis* and also the hide-damaging lesions caused by such infestation especially about the hump and neck. The main lesions of Humpsore are mainly found in the skin of hump and neck region. Hides (outer covering of large animal) and skin (outer covering of small animal) of cattle, sheep, and goat in the Indian subcontinent are frequently influenced by the filarial parasitic contamination, which is commonly known as "Humpsore". Stephanofilariasis is common in Bangladesh and India (Sign et al., 2014). Humpsore or stephanofilariasis is an important parasitic disease causing severe economic losses by damaging of lather, decreased of animal productivity, the effect on animal health and performance in work, reduce the market value of animals and its skin and hides. Most of these diseases are found in mountainous regions like Sylhet, Chittagong and 2.5% of cattle population being attacked by this disease in Bangladesh (Ibrahim et al., 2013). The outbreak

of Humpsore is found almost all seasons of the year but most occurs in the rainy season because the animals are mainly used for plowing purpose this time of the year (Baki, 1995). Only *Stephanofilaria assamensis* is only responsible for Humpsore in cattle in Indian subcontinent but nine species of Stephanofilarial parasites has been reported around the worldwide. The main lesion found in the hump region but Stephanofilarial dermatitis also found in the all parts of the body as for example legs, around the eyes, head, belly region, and scrotum. This disease is transmitted by the vector *Musca conducens* and distributed throughout the world (Subha, 2013). The major outcome of this disease is verminous dermatitis in the skin by damaging the hair follicles and skin glands. Stress affected animals are easily infected by the disease and show severe infections. Dermatitis on the neck regions as well as other body parts produces continuous itching. As a result, the male animals become incompatible for draught purposes. Affected cattle, especially milk cows show poor growth and decrease in productivity. In this way, farmers suffer heavy financial losses. Due to the indirect life cycle of the parasite, it is very difficult to control this disease (Akter et al, 2016 and Rai et al., 2010)

The main objective of this research is to find out the prevalence of humpsore in cattle in Kanaighat Upazila of Sylhet.

2. Materials and Methods

2.1. Study area and study population

The research on Humpsore was carried out at Upazilla Veterinary hospital, Kanaighat under the district of Sylhet, Bangladesh. The study was conducted from November 2016 to October 2017 and a total of 7702 Cattle were admitted during this period. The data were collected from the Veterinary hospital registered book, primary data were also gathered from the field visit as well as some of the prospective data collected from the owner.

2.2 Sample and sample size

The study was conducted on naturally Humpsore suspected cattle brought to the veterinary hospital during the study period. The total 7702 cattle populations registered at Kanaighat Veterinary Hospital during the period of one year (Nov 16 to Oct 17). From this total, 99

cattle were found to be clinically affected with Humpsore. During the study period; different months, seasons, ages and sexes of cattle were considered.

2.3 Data analysis

The unprocessed data were collected from owner's complaint and Veterinary registered book. Collected data were organized and analyzed statistically using MS Excel 2010.

2.4 Diagnostic procedure

The diagnosis of the disease was based on the clinical history, History of uses of the animal and clinical examination of the lesions. The lesions of Humpsore were detected by the physical examination technique. Loss of hair from the affected areas, increased thickness of the affected part, dermatitis in both neck region, lesion found in the head region, dermatitis also found in the leg part and also found in the base of the ear, swelling of the neck region and hardening, irritation, rubbing with objects, lacrimation, formation of crusts, blood-stained fluid were the clinical findings. These clinical findings help to the diagnosis of disease.

Fig: Initial stage of Humpsore

3. Formula of Prevalence

The percentage of a population that is affected with a particular disease at a given time.

$$\text{Prevalence} = \frac{\text{All new and pre-existing case during a given time period}}{\text{Total population during the same time}} \times 100$$

4. Results and Discussion

4.1 Overall prevalence of Humpsore

The present research was conducted to observe the prevalence of Humpsore in cattle in Kanaighat Upazila. The prevalence and associated results of this study are summarized in the table given below:

Data analysis: Table 1: Overall prevalence of Humpsore in cattle at Kanaighat Upazila

Region	No .of cattle (n=7702)	Affected	Prevalence	Prevalence %
Kanaighat Upazila	7702	99	0.01285	1.28%

To investigate the outbreak of Humpsore at Kanaighat Upazila of Sylhet, a total of 7702 clinical cases were diagnosed. Total 99 numbers of cattle were diagnosed as Humpsore among 7702 adult cattle in the present study and overall prevalence of Humpsore was found to be (1.28%) in Kanaighat Upazila given in table 1. This result is almost similar to the result of (Karim et al., 2014; Azam et al., 2017 and Hossain et al., 2016) and it was (1.1%) at the Upazila Veterinary Hospital, Mohammadpur, Magura, (1.18%) in Joypurhat Sadar Upazila of Bangladesh and (1.51%) in the Moulvibazar district. The present result has conversed to the earlier observation of (Nooruddin and Dey, 1990) who recorded (14.60%) prevalence of Humpsore in cattle in Bangladesh. In opposed with the result higher prevalence reported by (Akter et al., 2016 and Talukder et al., 2017) who reported (43.14%) in different areas of the Mymensingh district and 7.52% in irrespective areas of Bangladesh. In another finding of (Sunder et al., 2005 and Masud et al., 2017) they found that (35%) and (20%) animals were affected with Humpsore. It is very hard to draw any conclusion and this variation occurs because of different environmental location, over rainfall, because of the differences in study population, sampling procedures, research period, and different management practices.

4.2 Prevalence of Humpsore on the basis of months

In animals, the highest prevalence was found in May (2.93%) followed by June (2.16%), July (2.11%) while the lowest prevalence (0.60%) during November followed by December

(0.63%), January (0.90%) and October (0.97%) shown in table 2. Researcher Phukan declared that the maximum (45%) outbreak of Humpsoe was recorded in *Musca pattoni* in August and the lowest (16%) in December (Phukan et al., 2005). According to (Sign et al., 2014) who observed that the prevalence of the disease went up from the month of May (20.66%) till it reached the highest point in August (66.96%) and start decreased after that, till December.

Data analysis: Table 2: Month-wise prevalence of Humpsore

Months	Animals (n=7702)	Affected	Prevalence	Prevalence %
November 2016	824	5	0.0060	0.60%
December 16	632	4	0.0063	0.63%
January 2017	552	5	0.0090	0.90%
February 17	919	9	0.0097	0.97%
March 17	724	11	0.0151	1.51%
April 17	865	10	0.1156	1.15%
May 17	409	12	0.0293	2.93%
June 17	415	9	0.0216	2.16%
July 17	568	12	0.0211	2.11%
August 17	649	10	0.0154	1.54%
September 17	633	7	0.0110	1.10%
October 17	512	5	0.0097	0.97%
Overall	7702	99	0.0128	1.28%

By the above data analysis, we found that maximum prevalence of Humpsore found in the May month due to the rainy season. It is almost available in all seasons of the year but generally in the summer and rainy season due to high environmental temperatures and high moisture which optimizes the wide growth of microfilariae and fly vectors (Akter et al., 2016). Minimum Prevalence of Humpsore found in winter because parasite & vector cannot multiply properly due to the dry condition.

4.3 Sex wise prevalence of Humpsore

Data analysis: Table: 3: Sex -wise prevalence of Humpsore in cattle

Months	Male	Affected	Prevalence %	Female	Affected	Prevalence %	χ_2 test	P -value
Nov 16	211	2	0.94%	127	2	1.57%		
Dec 16	364	3	0.82%	321	1	0.31%		
Jan 17	411	5	1.21%	349	1	0.28%		
Feb 17	127	8	6.29%	102	-	-		
Mar 17	197	10	5.07%	497	2	0.40%		
Apr 17	203	3	1.47%	562	7	1.24%	14.378	0.0001
May 17	627	9	1.43%	293	3	1.02%		
June 17	458	6	1.31%	364	1	0.27%		
July 17	402	14	3.48%	312	-	-		
Aug 17	519	4	0.77%	229	5	2.18%		
Sep 17	311	2	0.64%	288	4	1.38%		
Oct 17	219	5	2.28%	209	2	0.95%		
Overall	4049	71	1.75%	3653	28	0.76%		

In this study, it was found that overall prevalence in males (1.75%) and have more prone to affect in Humpsore than female (0.76%) given in table (3) with chi square test (14.378) and P value (0.0001) which is less than 0.05 and that was statistically significant. In February and July there were no female cattle affected with Humpsore but in February highest prevalence found in male and it was 6.29%. On the other hand (2.18%) prevalence found in the female in August. This result is alike with the study of (Azam et al., 2017) who finds out the prevalence of Humpsore in male (1.56%) and in female was 0.79%. In contrary with the result higher prevalence recorded by (Sign et al., 2014 and Talukder et al., 2017) who reported that prevalence of male and female was (29.25%), (21.84%) and (58.65%), (41.65%) respectively. In one more study in West Bengal, the prevalence rate of the male was recorded about (17.34%) and (14.03%) of females (Roy and Misra., 1990). According to (Johnson et al., 1986) who declared that male is generally more affected than female cattle. The overall prevalence was higher in males (42.5%) than in females (37.8%) recorded by (Rai et al., 2010). Conversely, According to (Akter et al., 2016) who described that the prevalence of humpsore was higher in females (85.7%) than males (14.3%). Humpsore mainly found in male cattle due to higher used in draft purpose. Female cattle mainly used for the dairy purpose.

4.4 The outbreak of Humpsore Depending on the Age

The age of cattle was determined as 1-3 years, 3-5 years and above 5 years. In this age group, the highest prevalence associated with Humpsore within cattle was recorded in the adult cattle. The disease rate aggravated by the increase in age of animals. The older animals most liable to Humpsore due to loss of immunity and parasite can simply grow and multiply on the affected part. There is no contamination found in calves beneath 1 year of age. In this study it is found that the prevalence is high (2.06%) in the age group of over the 5 years old cattle followed by (1.24%) prevalence was found in 3-5 years age group, exhibited in table (4) and P was statistically significant (P<0.05). whereas other researchers found that the prevalence increases with the age of animals and then decreases for almost zero (resistance to Humpsore) to ten years because at this time animals are not used for working purpose (Roy and Misra, 1989 and Agrawal and Shah, 1984). In the view of (Talukder et al., 2017) highest prevalence was found to be between 3–6 years of age and it was (67.31%) which is more than that result.

In another study (Dewan, 1971 and Phukan et al., 2005) declared that cattle aged between three to six years had uppermost infection rate. Most of the clinical case found in adult male might be due to plowing.

Data analysis: Table 4: Age- wise prevalence of Humpsore

Age (year)	Affected	No. of Animals	Prevalence	Prevalence%	$\chi 2$ test	P –value
1-3	15	2416	0.0062	0.62%		
3-5	38	3061	0.0124	1.24%	18.666	0.0001
Above 5	46	2225	0.0206	2.06%		

4.5 Association in the expansion of Humpsore with seasonal effects

As a result of the change of season, the outbreak of Humpsore shows greatest during Rainy season and it was (2.37%) indicated in table 5. Second peak prevalence was found in the summer season and it was (1.19%) as well as autumn season (1.12%) and winter season (0.69%). According to seasonal influence, the statistical data investigation of this shows that the result (P- value 0.0004) was significant (P<0.05). Following to (Phukan et al., 2005) he finds out the maximum prevalence in the wet season and it was (53.34%) in Assam, India. Pursuant to (Ghosh et al., 2016) seasonal prevalence of Humpsore in Ishwargonj Upazila was (2.00%) in summer, (1.33%) in rainy and (2.89%) in the winter season. He also finds out the seasonal prevalence of Humpsore in Mymensingh Sadar Upazila and it was (1.03%) in summer, (1.10%) in rainy and (0.66%) in the winter season and almost similar to the present study. According to (Singh et al., 2014) who observed that the highest prevalence was found in rainy reason and it was (47.13%) compared with the summer season (21.64%) and as well as winter season (8.76%) but (Talukder et al., 2017) stated that highest prevalence was found in the summer season and it was (45.67%), but these findings are significantly higher than the present study. This result is nearly analogous with (Azam et al., 2017) who described that highest prevalence was in summer season (1.29%) followed by rainy season (1.24%) and winter season (0.98%). Therefore, the existing study has shown that the incidence of Humpsore increased during the rainy season but decreased in the winter season. These

variations can be due to different geographical regions and study periods. Disease rate high during summer and the rainy season might be due to high temperature, humidity and rainfall resulting increased the population of vectors by their extended reproduction performance during the rainy season. In the rainy season, nearly all the animals (males) are used for plowing of lands for cultivation and during plowing the hump, neck region and other parts of the body are manifested to injury. When animals show unwilling for plowing in the field, farmers often beat them with the whip or a stick etc. to make them active which makes the skin damage. Damage skin attracts the flies for their feeding and creates a favorable condition for parasites for their development and duplication. In injury parts, vector flies relies L3 stage of parasite when the flies suck exudates from the wound. Then L3 sage attained sexual maturity and continues their life cycle and concluding outcome is verminous dermatitis. At the beginning of the monsoon (May to June), the wounds on the surface were mostly in the crust form and were commonly small in size. Then it persists (this crust remained same or increased in size up to September with infrequent oozing. The wound progressively improved in size from October and became active with the oozing affinity (Rai et al., 2010).

Data analysis: Table 5: Season- wise prevalence of Humpsore.

Season	Month	Total animal n= 7702	Affected	Prevalence	Prevalence %	$\chi2$ test	P – value
Winter	Nov 16	2008	14	0.0069	0.69%		
	Dec 16						
	Jan 17						
Summer	Feb 17	2508	30	0.0119	1.19%		
	Mar 17						
	Apr 17						
Rainy	May 17	1392	33	0.0237	2.37%	18.029	0.0004
	Jun 17						
	Jul 17						
Autumn	Aug17	1794	22	0.0122	1.22%		
	Sep 17						
	Oct 17						

5. Conclusion

Parasites are an organism that can't survive without hosts. Multiplication is the major purpose of their life. That's why they enter into the host and take up valuable nutrient from the host. As a result, host suffers from malnutrition & therefore animals are infected with various diseases. Humpsore or stephanofilariasis is a parasitic skin disease caused by the presence of nematode in the skin of cattle. Males and young adults (over 5 years) are most affected. Lesions found mostly in hump region and also in the neck region. Disease transmitted via flies is very easy. Considering the current result outbreak of Humpsore occurred throughout the years and more prevalent in the rainy season as well as male cattle is more prone to this disease. Livestock of Bangladesh is playing a crucial role to develop our economy. When the parasite attacks, the animal reduces its production. As a result, there is an adverse impact on the economy of Bangladesh. For the good production of animals should be kept free of parasites all the time.

Acknowledgement

References

Agrawal, M.C and Shah, H.L. (1984). Stephanofilarial dermatitis in India. *Veterinary Research Community,* 8: 93102.

Akter, M., Hassan, M.K., Ahammed, M., Ali, M.A., Biswas, G.C., Islam, M.T., and Ehsan, M.A. (2016). Descriptive epidemiology of stephanofilariasis (humpsore) in cattle. *Bangladesh Journal of Veterinary Medicine,* 14 (2): 167-17.

Azam, M.G., Rahman, M.G. and Ali, M.H. (2017). Prevalence of Parasitic Diseases (Clinical Cases) in Cattle at JoypurhatSadar Upazila of Bangladesh. *International Journal of Science and Business*, 1(3): 140-148.

Badruzzaman, A.T.M., Siddiqui, M.S.I., Faruk, M.O., Lucky, N.S., Zinnah, M.A., Hossain, F.M.A. and Rahman, M.M. (2015). Prevalence of infectious and non-infectious

diseases in cattle population in Chittagong district of Bangladesh. *International Journal of Biological Research*, 3(1): 1.

Baki, M.A. (1995). Experimental transmission and pathology of humpsore (stephanofilariasis) in cattle. Ph. D. Thesis, Department of Pathology, Bangladesh Agricultural University (BAU), Mymensingh 2202, Bangladesh

Banglapedia (2015). Livestock National Encyclopedia Bangladesh pp: 1-15.

Dewan, M.L. (1971). Clinical features of stephanofilariasis in Zebu cattle in East Pakistan. Veterinariya Mascow, 3: 113-115.

DLS (2017). Annual Report of Directorate of Livestock Services (2016-2017), Bangladesh.

Ghosh, P.K., Kader, M.A., Riaz, M.M.U. and Rahman, M.M. (2016). Retrospective Study on Parasitic Diseases of Cattle at Mymensingh District of Bangladesh. *Veterinary Research International*, 4(4):144-147.

Hossain, M., Hasan, M .and Bhuiyan, M.J.U. (2016). Prevalence of clinical diseases of cattle of Moulvibazar district in Bangladesh. *International Journal of Natural Sciences*, 6(2): 54- 61.

Hossen, M.L., Mostofa, M., and Saiful, M. (2002). Comparative efficacy of some indigenous medicinal plant and a patent drug ivermectin against stephanofilariasis in Cattle. *Bangladesh Journal of Animal Science,* 31: 69-73.

Ibrahim, M.Z.U., Hashim, M.A., and Hossain, M.A. (2013). Comparative efficacy between surgical intervention, organophosphorus and ivermectin against humpsore (stephanofilariasis) in cattle. *Journal Advanced Biomedical Pathobiologial Research,* 3: 100-109.

Islam, A., Mostofa, M., Awal, M.A., Islam, M.A., Alam, M.R., Rahman, J., Rahman, M.M. and Anwar, A.K.M. (2003). Efficacy of Ivermectin against gastrointestinal nematodes and ectoparasites in calves. *Indian Veterinary Journal,* 80: 1173-1176.

Johnson, S.J., Arthur, R.J. and Shepherd, R.K. (1986). The distribution and prevalence of stephanofilariasis in cattle in Queensland. *Australian Veterinary Journal, 63*: 121-124.

Karim, M.R., Parvin, M.S., Hossain, M.Z., Islam, M.T. and Hussan, M.T. (2014). A report on clinical prevalence of diseases and disorders in cattle and goats at the upazilla veterinary hospital, Mohammadpur, Magura, Banglades. *Journal of Veterinary Medicine*, 12 (1): 47-53.

Masud, MA..A., Aziz, F.B., Labony, S S., Hasan, M.M., Islam, R., Rashid, M.B., Setu, S.A., Kabir, M.E. and Anisuzzaman. (2017). Comparative efficacy of tobacco leaves ointment and neem leaves extract against stephanofilariasis in cattle. *International Journal of Natural and Social Sciences*, 4(4): 39-42.

Nooruddin, M. and Dey, A.S. (1990). Further study on the prevalence and degree of severity of skin disease in domestic ruminants in Bangladesh. Bangladesh Veterinarian, 7: 75-81.

Phukan, S.C., Das, M. and Barkakoty, M.R. (2005). Humpsore in cattle in Assam. *Journal of Veterinary Parasitology*, 19: 19-22.

Rai, B.R., Rivastava, N., Jaisunder., Kundu, A., and Jeykuma, S. (2010). Stephanofilariasis in bovines: Prevalence, control and eradication in Andaman and Nicobar Islands, India. *Indian Journal of Animal Sciences,* 80 (6): 500–505, June 2010.

Roy and Misra. (1989). Incidence of stephanofilarial dermatitis in cattle in Nadia district of West Bengal. *Indian Veterinary Journal,* 66: 111-114.

Roy and Misra. (1990). Prevalence of stephanofilariasis in domestic animals in different districts of West Bengal. *Journal of Veterinary   Parasitology,* 4: 41-43.

Singh, K.S., Mukhopadhayay, S.K., Majumder. S., Laha, R., Niyogi, D. and Ganguly, S. (2014). Study on different aspects of stephanofilarial dermatitis infection in cattle population of West Bengal 5:19- 22.

Singn, K.S., Mukhopadhayay, S.K., Majumder, S., Laha, R., Niyogi, D. and Ganguly, S. (2014). Study on different aspects of stephanofilarial dermatitis infection in cattle population of west Bengal. *Journal of Institute of Integrative Omics and Applied Biotechnology*, 5(1):19–22.

Subha, G. (2013) Biological and scientific opinion on study on the various aspects of "humpsore" in cattle population of India. *A Review of Journal Biological Science Opinion,* 1: 98-100.

Sunder, J.A.I., Rai, R.B., Kund, A., Chatterjee, R.N., Senani, S. and Jeykumar, S. (2005).Incidence and prevalence of livestock diseases of Andaman and Nicobar islands. *Indian Journal of Animal Sciences*, 75(9):1041-1043.

Talukder, M., Sikder, S., Sarker, K., Pau,l A.K. and Amin, M.R. (2017). Comparative efficacy of ivermectin (Vermic®), neem and trichlorfon (Negotox®) against humpsore in cattle. *Asian Australasian Journal of Bioscience and Biotechnology*, 2 (1): 68-74.

Cite this article:

Published by