



## KNOWLEDGE, ATTITUDE AND PRACTICES OF HERDSMEN ABOUT TICKS AND TICK-BORNE DISEASES IN DISTRICT MULTAN

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### ABSTRACT

Ticks (Class Arachnida) are ectoparasites of many vertebrates from wild to domesticated ones. Following tick infestation and consequent blood sucking, animals weaken and their performance decrease considerably. Besides blood sucking, ticks are vector of diseases like Lyme disease and Crimean-Congo Hemorrhagic Fever (CCHF) to animals and also humans. To know how the factors affecting prevalence of ticks in herds in Punjab, the present study was conducted. Herdsmen were interviewed by using a pre-tested, semi-structured questionnaire. The majority (51.8%) of herdsmen interviewed was between 41-61 years old. Most interviewees (78.30%) knew well that their animals had ticks. Out of 106, only 22.6% farmers adopted hand picking method. Most respondents (96.2%) used nothing to prevent ticks. Only 31.13% herdsmen had private hospital facility present near them. It was observed during the study that the knowledge of herdsmen was not good and they did not access modern facilities of animal health. By improving knowledge of farmers about ticks and providing vet facilities near to them, not only production of domesticated animals can be increased but society also can be prevented from getting tick borne lethal diseases like CCHF.

**Keywords:** CCHF, Domesticated animals, Herdsmen, KAP, Southern Punjab, Ticks

### INTRODUCTION

Domesticated animals are the backbone of Pakistan's economy and due to ectoparasites, production of farm animals has not been achieved as per their potential capacity (Sajid *et al.*, 2008). Animals are not only a source of protein, other animal derived products such as hides and bones are important for man (Kakar and Kakarsulemankhel, 2008). Multan is in Southern Punjab, almost in the center of the country and serves as a major hub of agricultural activities in the country (Ali, 2013). Herders and sheep men from other provinces especially Baluchistan and Khyber Pakhtunkhwa (KPK) are frequently visiting the city for sale and purchase of their animals which laterally transported to all over Pakistan. Ticks are hematophagous arachnid ecto-parasites feed on blood of many animals including man (Furman and Loomis, 1984) and belong to Order Parasitiformes. Ticks have three important families *viz.* Ixodidae, Argasidae and Nuttalliellidae (Guglielmone *et al.*, 2010). Ixodidae and Argasidae have approximately 700 and 200 species, respectively while Nuttalliella has only one. Ticks are distributed all around the world (Jongejan and Uilenberg,

1994) and are vigorous disease vectors after mosquitoes (Bars, 2009). They are found mainly in the tropical and subtropical areas where they restrain livestock production (Githiori 2004; Swai *et al.*, 2005).

Ticks (both sexes) need blood as a main source of energy from its host. They locate their host by breath, odors, sensing body heat, vibration of the victim (s). Ticks are usually found on udder ears and tails of animals (Kabir *et al.*, 2011). These creatures are responsible for economic losses to cattle and sheep herders due to drop in milk production, retarded growth, damage to skins and wool (Biswas, 2003; Gharbi *et al.*, 2006). Victimized animals show anemia, weight-loss and feel uncomfortable due to irritation caused by ticks (FAO 1984; Norval *et al.*, 1992).

Ticks transmit diseases like babesiosis, theileriosis, anaplasmosis and other to animals and humans (Shemshad *et al.*, 2012; Alim *et al.*, 2011) worldwide. Tick-borne encephalitis (TBE) has been reported from various countries in Europe and Asia (Lindquist and Vapalahti, 2008). Humans become the host of TBE by using impure raw milk, livestock products or through the biting of infected tick (Charrel *et al.*, 2004). Crimean-Congo Hemorrhagic Fever (CCHF) is a very

serious contagious viral infection with 10% - 50% death rate (Qadir *et al.*, 2017). Many domestic and non-domestic animals such as goat, sheep, buffaloes, cows and small mammals, rodents, birds are hosts of this virus. CCHF has been reported from more than 30 countries in various continents including Asia, Africa, Europe and Mediterranean region (Qadir *et al.*, 2017).

In Asia, the disease has been reported mostly from Iran, Afghanistan, Pakistan and India (Qadir *et al.*, 2017). This infection spreads by many ways such as biting of tick vectors, through infested animal's blood or tissue contact. Because ticks are external parasites of animals, so the people handling or involved with livestock industry and slaughterhouses are at high risk of getting infected (Carter *et al.*, 2012). People having professions that demand manual handling like veterinarians, milkmen, staff of animal markets etc. can also acquire the virus by contact of body fluid from contaminated animals.

In Pakistan, CCHF incidents increased mostly due to poor management services, lack of knowledge about the disease, its vectors and negligence. As it is a fatal disease with no vaccine and particular treatment, so it can be controlled with sufficient knowledge about vector management strategies and with collaborators all stake holder industries and especially Livestock Farms. Therefore, information about the knowledge and practices adopted by herders and livestock farm managers is important to rectify and fine tune the prevailed ticks and disease control tactics.

Baluchistan is at more risk to get trans-boundary infection due to borders sharing with Iran and Afghanistan. The both countries had a long history of disease occurrence. In the situation, Multan is an ideal place to study the knowledge, aptitude and practices adopted by local herders. Considering the provided information, the management practices may be improved so that tick borne diseases especially fatal CCHF may be avoided and precious human lives can be saved.

**Table 1**

Socio-demographic characteristics of the Respondent.

Age (year)				Education			Monthly Income (Rs.)			
15-19	20-40	41-61	> 61	Illiterate	Middle	Matric	< 6000	6000-21000	22000-37000	>37000
8	42	55	1	46	17	43	46	27	17	16

Total 106 respondents, all were men involve in this survey because in these locations most livestock farming is practiced by men. The herdsmen interviewed about ticks in livestock were mostly (51.8%) between 41-61 years old, which shows that in the study area animal farming is mostly carried by middle aged people. There were 46 (43.39%) farmer's illiterate, 17 (16%) were with middle education and 43 (40.56%) respondents were matriculate. The monthly income of 46 (43.39%), 27 (25.47%), 16 (15.09%) herdsmen were <6000, 6000-21000 and >37000 respectively, in Pakistani currency.

**MATERIALS AND METHODS**

**Study area**

The study was conducted in Multan district (30.2° N and 71.4° E) 123-meter-high above sea level and comprised of three tehsils *viz.* Multan, Shujabad and Jalalpur Pirwala. The study was carried out in all tehsils. These places are famous for establishment of dairy farms, and marketing of animals and animal products like milk, meat, skins, hides and catguts.

**Breeds of domesticated animals**

The following breeds of domesticated animals are prevailed in the area under study:

Buffaloes: Nili Ravi, Kundi

Cattle: Sahiwal

Goats: Layllpuri, Beetal, Nachi, Dera Din Panah

Sheep: Buchi, Thalli

**Sampling, Data collection and Analysis**

A cross sectional survey was carried out from July to October 2017 from Multan District, using a semi structured, pre-tested questionnaire having 43 questions. Farms were selected by using random sampling method (Mureithi *et al.*, 2015). Age, gender, education and income of respondents were incorporated as demographic attributes in the study. A total of 106 herdsmen were interviewed to collect information. The questionnaire was prepared in English but the questions were asked in local languages (Urdu, Saraiki and Punjabi) after translation. Each interview was lasted about 45 minutes. The data collected was then entered in MS Excel 2016 spreadsheet and analyzed statistically by using SPSS.

**RESULTS AND DISCUSSION**

**Respondents Socio-demographic Characteristics**

**Table 2**  
Responses regarding Knowledge.

Knowledge about		ASSOCIATION OF VARIOUS QUESTIONS WITH						
		EDUCATION %			INCOME (Rs.) %			
		Illiterate	Middle	Matric	<6000	6000-21000	22000-37000	>37000
Animals have ticks	Yes	35.8	11.3	31.1	33	22.6	9.4	13.2
	No	7.5	4.7	9.4	10.3	2.8	6.6	1.8
Max infestation	Mar-Apr	0	2.8	0.9	0.9	1.8	0	0.9
	May-Jun	1.8	1.8	2.8	1.8	1.8	1.8	0.9
	Jun-Jul	31.1	11.3	26.4	31.1	16	10.3	9.4
Cause of tick infestation	Yes	27.3	8.4	26.4	30.1	16.9	10.3	4.7
	No	16	7.5	14.1	13.2	8.4	5.6	10.3
	Ticks come from	Yes	0.9	0	2.8	1.8	0	0.9
Animals water consumption	No	42.4	16	37.7	41.5	25.4	15	14.1
	Much	7.5	1.8	7.5	8.4	3.7	0.9	3.7
	Sufficient	31.1	13.2	30.1	30.1	20.7	13.2	9.4
	Less	4.7	0.9	2.8	3.7	0.9	1.8	1.8

**Responses regarding Knowledge**

The data revealed that 38 (35.8%), 12 (11.3%) and 33 (31.1%) respondents which knew about presence of ticks on their animals were illiterate, educated up to middle and matriculate, respectively. During survey, 68.86% interviewees responded that tick infestation mostly occurs in June-July. The study also depicted that people were aware

about the season of tick attack. According the results, they knew that in summer, ticks attack livestock and with the onset of winter; they disappear, hide in the cracks and crevices in the farm walls and under the animal dung (Table 2). Majority (62.26%) of the interviewees replied that animal dung caused the ticks infestation in livestock.

**Table 2**  
Responses regarding Attitude and Practices:

Variables		ASSOCIATION OF QUESTIONS WITH						
		EDUCATION %			INCOME % (Rs.)			
		Illiterate	Middle	Matric	<6000	6000-21000	22000-37000	>37000
Apparent health of animals	Over	3.7	2.8	5.6	8.4	1.8	1.8	0
	Ideal	34.9	12.2	31.1	32	22.6	12.2	11.3
	Under	4.7	0.9	3.7	2.8	0.9	1.8	3.7
Vet. available nearby	Yes	10.3	5.6	15	11.3	6.6	4.7	8.4
	No	33	10.3	25.4	32	18.8	11.3	6.6
Animal vaccinated	Yes	22.6	3.7	16	23.5	6.6	7.5	4.7
	No	20.7	12.2	24.5	19.8	18.8	8.4	10.3
Vet. checked the animals	Yes	25.4	1.8	16	19.8	5.6	11.3	6.6
	No	17.9	14.1	24.5	23.5	19.8	4.7	8.4
Management practices adopted	Chemical	28.3	10.3	28.3	28.3	17.9	13.2	7.5
	Manual	11.3	4.7	6.6	9.4	5.6	1.8	5.6
	Both 1&2	3.7	0.9	5.6	5.6	1.8	0.9	1.8

### Responses regarding Attitude and Practices

The study shows that illiterate (28.3%) and matriculate (28.3%) herdsmen use only chemicals for the control of tick infestation in domestic animals. Only 22.6% herdsmen adopted cultural (picking by hands) practices for the management of ticks in their animals, while others used both chemical and cultural practices for the same. During the study, only 46 (43.3%) respondents visited qualified Veterinarian for checking of their animals. During the surveyed period, only 45 (42.45%) interviewees vaccinated their animals against ticks. Large numbers of participants (68.8%) have no veterinary facility near their farm whereas only 31.1% have the same near the farm. According to the study, 28.3% respondents with monthly income <6000 and 7.5% with >37,000 used chemicals for the control of ticks.

Through the current survey, it has been known that most of the respondents were aware about tick infestation in livestock. In the study area, most farmers don't have nearby hospital facility for animals. According to respondents, no tick control services had been provided by the government in the district and they had to purchase medicine from private sectors which were costly. While in fact, a well-established Veterinary Department exists all over the province, including the area under study. It seems that due to poor extension services of the Department, herders did not get benefit from available services. Our results are different from those reported by Ndebele *et al.* (2007) from Zimbabwe, where extension officers and government provide acaricides for the control of ticks. In the study area, most farmers used traditional methods such as minerals and kerosene oil for the control of ticks because they think that acaricides provided by Government, may harm their animals. The regular use of acaricides may induce resistance in ticks against these chemicals. The mineral oils had been used for long time but can be harmful for animals due to absorption of lead in animals' body (Masika *et al.*, 1997) although these oils do not show any apparent allergic reactions. Moreover, the same are less effective as compared to acaricides used against ticks. Some respondents practice to crush the ticks with their hands resulting in contact with contaminated fluid from ticks, through which contagious diseases such as CCHF can be disseminated. It was not a healthy practice adopted by herdsmen in the study area. This should be discouraged and the use of proper control measures should be adopted.

In the area under study, the summer season is long followed by short rainy spell. Responding farmers informed that in summer, highest populations of ticks had been observed. These observations were similar to that observed in studies conducted by Spickett *et al.* (1989), Muchenje *et al.* (2008) and Marufu *et al.* (2008). Our study had been favored by those conducted by Sayin *et al.* (2003), in which they declared summer and fall as the seasons of highest and lowest tick infestation, respectively. Due to favorable humidity and temperature rainy season is best for tick production because hatching of eggs and reproduction of ticks increased during these months.

According to herdsmen, animals dung is the main reason of ticks' prevalence but some other factors were also involved in tick distribution like emitting of heat and carbon dioxide from animal's body. This information was not in accordance with some earlier studies conducted by Riaz *et al.* (2017) and Rony

*et al.* (2010) where they enlisted large number of factors promoting tick infestation, such as lack of veterinary services, climate change and lack of information about ticks. Some similar surveys carried out by Ikpeze *et al.* (2011) and Sajid *et al.* (2007) revealed that neck, ears and tails are suitable sites for tick attachment in livestock because these sites provide shelter for ticks hiding. Such concealed sites help to keep the ticks away from access of prey.

The present work showed that ticks infestation in sheep was more intense in Tehsil Shujabad and Jalalpur Pirwala as compared to Multan. The observed difference is probably due to the reason that residents of the tehsils mentioned earlier lack education, awareness and unhygienic condition. The situation remained unchanged since some earlier studies conducted by Khan *et al.* (1993) and Irshad *et al.* (2010). Contrasting the tehsils mentioned above, situation in Multan is somewhat better where less infestation of ticks was observed which may be due to regular vaccination, educational level and management practices. These results were similar to those depicted in work carried in Barani Livestock Production Research Institute (BLPRI) Kherimurat, District Attock and National Agricultural Research Centre (NARC), Islamabad, Pakistan, and reported by the workers mentioned above (Irshad *et al.*, 2010).

### CONCLUSION

Limitations for livestock production are imposed by ectoparasites and diseases they spread. In the survey area, livestock farming is among the main sources of employment for rural people. The domesticated animals of this region have high infestation of tick species (the results will be given elsewhere). During the present survey, it was observed that herdsmen were illiterate and less educated who are not able to update their knowledge regarding ticks and tick-borne diseases. So, there is need to educate them about the subject matter. Moreover, a gap of coordination between farmers and Extension staff of provincial Livestock department was observed which is needed to be mitigated. Therefore, it is recommended that fulfilling the above-mentioned shortfalls should be prioritized, so that health and production of the animals can be improved and lethal diseases transmitted by ticks in the animals and humans can also be avoided.

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### CONFLICT OF INTEREST

The authors affirm that there is no conflict of interest.

### AUTHORS' CONTRIBUTION

Mr. Ramzan collected data and write up of the manuscript. The research activity was performed by Mr. Gahulam Murtaza. Mr. Naeem Ullah planned

the study and also did the review of the manuscript. Mr. Haroon Bukhari helped in manuscript writeup. The statistical analysis was performed by Mr. Alamgir.

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