Knowledge, Attitude and Practice among the Community People Living in Gangni Upazila of Meherpur District Regarding Anthrax Infection

IEDCR

Institute of Epidemiology, Disease Control and Research (IEDCR)

Ministry of Health and Family Welfare

Government of the People's Republic of Bangladesh

Contents

Introduction

Anthrax (popularly known as "*Torka*" in Bangladesh) is an acute infectious zoonotic disease caused by *Bacillus anthracis*, a soil-borne, spore-forming bacterium (OIE 2008) . The anthrax spore is resistant to heat and chemical disinfectants, and this dormant stage may persist and remain viable for several decades in soil. The bacterium primarily infects herbivores such as cattle, sheep, goats, horses and pigs after entering the body through feed and water contaminated with viable spores. Usually, Anthrax is transmitted from the infected animals to humans through food or other material originated from an animal that is contaminated with *B. anthracis* or its spores (Sitali, Twambo et al. 2018).

Anthrax naturally occurs in almost all countries in the world; however, the disease is most prevalent in tropical and sub-tropical countries. In recent years, the disease has been reported in Sweden, USA, Italy, Australia and many places in Europe. In many Asian and African countries, anthrax outbreak occurs periodically in animals and humans (WHO 2008). In Bangladesh, the disease was found periodically in animals and humans until 2009, but in recent years the disease has occurred repeatedly; the outbreaks indicate that the disease is no longer sporadic rather than enzootic in Bangladesh. Anthrax was first reported in Bangladesh from 1982 to 1984 both in human and cattle. Up to 2009, no human anthrax cases had been reported in Bangladesh for more than 25 years.

Inadequate livestock vaccination coverage, butchering sick animals, disposing of butchering wastes and carcass in the environment where animals graze, handling raw meat, contact with sick animals, social norms, and poverty contributed to the outbreaks of anthrax in Bangladesh. Favorable environmental conditions such as soil pH, Ca content, moisture, soil type, high ambient temperature, and rainfall and topography are positively correlated with the persistence of anthrax spores and subsequent outbreaks (Ahsan, Rahman et al. 2015). Livestock Research Institute of Department of Livestock service produces only 6 million Anthrax vaccines for 55.13 million ruminants of Bangladesh.

Human infection is often associated with eating the meat of infected animals (Mwakapeje, Høgset et al. 2018, Nayak, Sodha et al. 2019), and as a result of coming into contact with infected animals or contaminated animal materials during agricultural activities, including the butchering of livestock or industrial exposures through the processing of hair and bone

(Joyner, Lukhnova et al. 2010, Mwakapeje, Høgset et al. 2018, Nayak, Sodha et al. 2019). One of the drivers that may contribute to the persistence of anthrax is human behavior (Opare, Nsiire et al. 2000). For instance, in Kenya, it was reported that human anthrax cases most often occur linked to animal anthrax. In most cases, human behaviors, especially slaughter and consumption of meat from animal anthrax cases, has been implicated (Obonyo, Farr et al. 2018). Human anthrax in Bangladesh is intrinsically related to enzootic anthrax affecting the livestock population. This is because of low vaccination coverage despite the country's routine anthrax vaccination program for livestock. On the country-side, people and their farm animals live in close vicinity, and direct or indirect human contact with sick and diseased animals is frequent. In previous years, inadequate livestock vaccination coverage, butchering sick animals, disposing of butchering wastes and carcass in the environment where animals graze, handling raw meat, social and environmental factors, scarcity and limitation contributed to the outbreaks of anthrax in Bangladesh (MAI 2017).

Control of anthrax among humans depends on the integration of veterinary and human health surveillance and control programs. Routine cross-notification between the veterinary and human health surveillance systems should be part of any zoonotic disease prevention and control program, and close collaboration between the two health sectors is particularly important during epidemiological and outbreak investigations.

Primarily, herbivores like cattle, sheep, goat, horse and pig are affected with anthrax, and the disease is usually fatal for ruminants. It has been reported that occurrence of anthrax in animals and humans partly influenced by lack of awareness, improper perceptions, reluctant attitude, and/or misconceptions about zoonotic nature of the disease. Hence, it is crucial for animal particularly cattle owners and the consumers to acquire a certain level of awareness about livestock diseases in their areas, the risks they pose, and possible transmission routes to humans. Although a few relevant studies in communal areas have focused on risk factors relating to human anthrax outbreaks, few reports are available describing the detail risk factors particularly among the people in rural areas. The objective of this study was to assess the risk factors of anthrax outbreak among cattle owners and consumers at high-, medium- and low-risk areas in Bangladesh.

Rationale

Anthrax is endemic in northern part of Bangladesh with frequent occurrence of outbreaks especially in Gangni Upazila of Meherpur district. It is therefore imperative to study the knowledge, perception, practices and identify risky practices of these diseases. The results obtained would provide valuable information to health planners that will guide decisions for interventions, coordination and integration of prevention and control strategies of anthrax before, during and after outbreaks. For the purpose of early recognition, detection and notification, the community needs to have correct knowledge regarding the disease. Attitude towards anthrax and practices regarding early recognition, detection and notification and health-seeking behavior in this community had not been properly documented too. In the presence of this information gap, this study was undertaken to assess knowledge, attitudes, and practices regarding anthrax among community members.

Aims and objectives

This study aims to understand community people's perception, attitude and practices regarding anthrax infection and disease transmission, animal rearing practices, vaccination, practices of sick animal slaughtering and disposal of dead animals. Depending on the research questions, the study will be carried out to serve the following objectives:

- To find out community perception on human and animal Anthrax,
- To identify community practices on domestic ruminant rearing for accelerating or preventing Anthrax,
- To characterize the practice of the community in handling sick animals with particular emphasis on Anthrax,
- To find out the practices of the community in carcass disposal of animals,
- To characterize the economic impact of anthrax at the household level,
- To find attitude and practices of the community and service providers in preventing Anthrax including vaccination,
- To find out the socio-ecological factors that influence human behaviors and practices towards accelerating or preventing Anthrax infection,
- To find out potential pathways of how this bacteria spreads,

- To uncover the challenges of and recommendation for community intervention of controlling Anthrax.

Methodology

Site Selection

We conducted this qualitative study in Gangni Upazila of Meherpur District where we find history of suspected human and animal anthrax report. According to hospital record the prevalence of anthrax among human varies depending on the location. Suspected anthrax outbreaks were defined as report of cutaneous lesions, context with anthrax infection, among people who had contact with a dead or acutely sick ruminant within 30 days prior to lesion onset.

Duration

This qualitative study carried out from August, 2020. It took Five days to train Research Assistants in the initial stage. From 19 September to 8 October 2020 we carried filed work and data collection component. After that it took another 2 months for analyzing and report writing.

Sampling

Qualitative data regarding this study were collected by direct observation, interviewing the respondents in small focus group discussion (FGD) and individual in-depth interview (IIDI. The participants were either affected or owner of the affected animal or the community people of the affected areas.

Participants were purposively sampled from anthrax affected areas, and inhabitants who are involved with domestic ruminant rearing practices, participate in animal slaughtering practices, affected persons or family members of the affected households, policymakers or administrators, service providers, community leaders.

Data Collection Tools

In-depth Interviews

In-depth Interviews were conducted to better understand ruminant rearing practices, animal slaughtering practices, and vaccination knowledge among the community people.

These interviews held with the patients from community level, community people whose livestock affected by anthrax, community people who are raising livestock and butcher. We have used purposive sample to select the participants.

Focus Group Discussion

FGDs were conducted among the community people, community leaders and service providers to better explore community people's knowledge, attitude and practices, the roles of community leaders and service providers. The participants were selected purposively from the community and health facility. 8 FGDs each with 6-12 participants has been conducted.

Key Informants' Interviews

KIIs were conducted to understand attitude and practices of community and policy regarding anthrax. We included as participants from local administration, local health service department, district and Upazila livestock office, Media representative and local level veterinary quack.

In total, sample size was 32 in-depth interviews (IDIs), 25 key informant interviews (KIIs) and 8 for focus group discussions (FGDs).

Table 1: Methods with numbers of interviews

Methods	Types of Informants	Sample size
Focus Group Discussion	Community people	4
	Service Providers	2
	Community People	2
Key Informant Interviews	Officials from District and Upazila livestock Office	2
	Local administrators (District, Upazila and Union level)	10
	Animal vaccinator	2
	Veterinary Quack	2
	Human health service providers	2

	Representative from market committee	2
	Media representative	1
	Community leaders	4
In-depth Interviews	Community people	32

Validity of data

There are several ways to address the aspect of validity in qualitative research components. We used a mix methodological approach to ensure validity. By methodological mix of this phase of the study meant to employ more than one method to investigate the concerns in relation to IVR survey. In this study, Focus group discussion, Key informant interview and semi-structure interview were conducted. Utilizing these methods the investigators assed the community knowledge, perception and attitude towards ruminant raising and anthrax disease in Gangni Upazila, Meherpur.

All of the findings, generated off the codes area comparative understanding gained from all the different methods mentioned above. This study component reported only those issues that have been confirmed from at least two different methods (e.g. KII, IDI & FGD).

Ethical Consideration

Ethical clearance was obtained from the Institutional Review Board of Institute of Epidemiology Disease Control and Research (IEDCR). Prior to the discussion/interview, the researchers explained the purpose of the study to the participants. The consent form was read and informants were subsequently requested to sign or give thumb impression on the form. Interviews and audio recordings were conducted only after consent was obtained. Efforts were made to maintain the confidentiality of data.

Besides maintaining confidentiality, researchers explained the informant's rights during interviews and discussions. All informants were told that they could refuse to answer any question or terminate interview at any time if they had reservations about responding a question.

Data Analysis

An iterative process followed to analyze the interviews and group sessions. Firstly, the interviews had transcribed verbatim into Bangla directly from the audio recordings. Data familiarization will be done by literal, interpretative and reflexive reading of transcripts by the research team. MAXQDA (qualitative data analysis software) version 2018 used to manage, organize and code the data. Both deductive (a priori codes) and inductive (emerging codes and sub-codes) approach had applied and quotations will be retrieved accordingly from the appropriate text segments. During the code creation process, a number of secondary sources were reviewed to make sure the created codes are consistence with previous studies. This process helped to establish accuracy of the codes and coding process. Data reduction done by clustering and comparing. Finally, thematic analysis had conducted.

Findings

Results were narrated on the themes that were generated out of the analytical process. In terms of presenting the data that we have collected from the community participants, a uniform structure was followed.

A table shows the number of informants in each category at the beginning of the discussion and it will be followed by a short description of the socio–economic context of our informants who have participated in different data collection procedures; e.g. Focus Group Discussions (FGD), Key Informant Interviews (KII) and In-depth Interviews (IDI). The next section would give a clear idea of our findings in the formative phase.

Socio-economic context of informants

The table below provides a glimpse of the socio–economic background of the informants in order to contextualize the findings. We found that the mean age of the participants were 40 years. One Third of the participants were female and rest was male. The highest educational level of IDI, FGD and KII participants were 18 years that is postgraduate level. Among the IDIs and FGDs 23 participants didn't take any formal education.

In terms of professional activities, in FGDs and IDIs, several number of female were working as school teacher, and a few number of respondents had been working at health services, and two of them were student and rest of them were housewives. Data shows that the male

respondents were involved in irregular professions i.e., agriculture, butcher, business, labor, mason, teacher, and Imam (religious). By nature, the Key Informants were affiliated with different government services.

Table 2: Socio-economic information of the informants

Variable	**KII (25 Participants)**	**IDI (32 Participants)**	**FGD (70 Participants)**
Age (Mean)	-	25	41.3
Sex			
Male	23	21	51
Female	2	11	19
Education			
No formal education	-	12	11
1-5 (in years)	-	6	8
6-10 (in years)	-	9	19
10+ (in years)	-	3	13
Graduate	-	1	9
Post Graduate	-	1	6
Occupation			
Farmer	-	12	18
Business	-	3	8
Butcher	-	2	-
Housewife	-	10	11
Labor	-	1	-
Mason	-	1	1
Teacher	-	1	4
Student	-	-	4
service	-	1	22
Imam	-	-	1

Village doctor	-	-	1

Current livestock rearing practices

In the studied villages, it was found that most of the family had own livestock. Most of the livestock owners keep their cattle in a cowshed and their goats either in their bedroom or on the veranda on their household premises. Sometimes, cow and goats remain in the same shed in separate part. It was reported that, usually farmers clean the cowshed once a day. A number of respondents reported that they keep their cows in the cowshed for whole day. As cows remain in the same place for the whole day, they clean shed for two times in a day. Some of their sheds were pucca floor and had drainage systems. As a result, they can clean the floor with water. In the studied areas, it was reported that most of the family members get involve in cattle rearing practices. Almost everyone takes care of their cattle whenever anyone remain free.

In the cowshed, the farmers fed the cattle dry rice straw, green leaves of rice and wheat, flour, chhola, banana leaves and tree, molasses and a variety of green grasses that grew locally and gathered from the pastures. In the beginning of the monsoon season, green leaves and tender stems grew from the old cut stems of rice in the pastures and farmers reported that they fed those tender stems to their livestock. Moreover, it was also reported that some villagers fed grass to their cattle that had been collected from the adjacent fields and water bodies. Throughout the year, farmers also fed their cattle concentrated feed, including rice husks, wheat bran, and oil cakes which they purchased from the local markets. However, it was revealed that community people do not wash grass to prior to feeding the livestock regularly. However, a

Case Study 1

During a rural male IDI, one 50 years old agriculture, who has primary education up to 3th grade. He has cattle and goat at his home. He feed his livestock grass, wheat, corn, chickpea etc. In his family every person take care of his livestock. He don't have any training on livestock raising. He said that he rarely bring out his cattle from the shed. Usually they keep cattle in the shed, feed there and regularly they clean the shed with water. Even they bath their cattle in the shed. He said that this is the common practice in their village.

number of participants reported that they clean the grass with water when they find/observe the dust and mud remain with the grass.

Slaughtering sick animals, and disposal of butchering waste

Slaughtering sick livestock found to be a common community practice in the studied area. Most of the respondents informed that the farmers preferred slaughtering moribund cattle and goats while the cattle or goats were still alive so that the meat could be eaten. Moreover, when cattle and goats got severely sick, the livestock owners, neighbors and peers often suggest to slaughter the livestock and sell the meat within the community to minimize the financial loss of owner. After slaughtering, the livestock owner keeps some meat for themselves and sold remaining meat to neighbors or residents of neighboring villages with a lower price. Due to the lower price, people also buy sick livestock meat willingly. One respondent stated that,

> *…….People slaughter their sick animals and they can sell their meat quickly. Because they keep the meat price 300 to 350 taka. People know that this is sick animal, therefore people buy because they can buy meat in cheap. (NH_IDI_LA_02)*

While discussing the slaughtering practices of sick livestock, it was found from the several interviews that, the owners of livestock usually slaughtered in their yard of the household. When any cattle were slaughtered on the household premises, the owners rinsed the slaughtering places with water to remove the blood.

As depicted one of the respondents,

> *The livestock will be slaughtered in such places, where that livestock got sick. Sometimes people have to slaughter their livestock within the shed. And a shed is located near to the living place or home. (NHN_IDI_Butcher_01)*

It was also reported from the FGDs (where community people participated) that sometimes butcher also buy sick livestock from the community with a cheap price. This finding also aligned with the statement of a key informant respondent,

> *Community people slaughter their cattle when they see any sickness. They announce about availability of meat by mike. People buy those meat and think that anthrax causes*

only skin wound, people don't die. So, community people don't think that Anthrax is harmful. Moreover, they also getting meat in low price than market price. But through the whole process including slaughtering sick animals, store meat, consumption and waste dumping increase the public health risks and create environmental hazard as well. (Livestock Officer)

Few of the respondents informed that after meat processing they buried the waste and leftovers. Several respondents informed that sometimes people dispose in open water sources, including river, canal, and ponds or in open spaces, bushes, owned agricultural fields. These waste products were reported to include blood, bones, hooves, horns, teeth, fat, bladder, stomach contents, and eyes. People usually sell the livestock skin to the cobbler or butcher.

Moreover, a number of participants reported that, crows, dogs, and cats eat discarded carcass waste and move pieces of the carcasses to other locations. Dogs were often seen carrying the carcass waste to other locations, both in and around household premises. When livestock die before they could have slaughtered, the carcasses were buried. However, often people throw these in the water bodies or agricultural fields, in case of unavailability of a suitable place for burying. Therefore, it is very difficult to move the cattle carcasses one place to another place and burry under the ground. However, the respondents also reported that the goats are comparatively easy to move and buried in shallow pits on privately owned land. The discarded waste from slaughtered animals, foxes and dogs often dig up these carcasses and scattered pieces or remains the carcass across larger areas. Several participants said that they don't allow to peel the skin after death of their livestock.

It was also found from the Key Informant that there was no central slaughtering system in the studied areas. Recently one central slaughtering place established under the City Corporation but there was no veterinary doctor/surgeon and not testing system whether livestock is sick or not. There is rules in book but practically no system remain.

Knowledge about human infection from anthrax infected livestock

In general, people do not take human anthrax seriously. Several participants said that they had consumed anthrax infected meat and did not face any problem. However, people have either partial or improper understanding on anthrax and how it spreads. Interestingly, people tended to describe anthrax from their very own perspective. For example, one of the respondents stated,

> *Anthrax is a wound. It is a virus. It happened if someone handle anthrax infected meat. I don't know what happened if someone have anthrax infected meat. (NH_IDI_LA_01)*

Stressing on the effect of the virus, people tried to explain the disease by the visual aspect of the problem. As a result, people may not take it seriously, since such wounds may occur for other reasons.

Most of the participants didn't have proper knowledge on anthrax. Several participants don't hear the name Anthrax or Torka. However, they even did not know the other infection pathways other than handling or slaughtering infected livestock or meat. The following respondent explained,

> *I had small wound on my hand, but didn't feel pain and fever, there was only itching. Doctors from Upazila hospital said that this is anthrax. I didn't slaughter and handle meat. I have bought mutton from the bazar and consumed. I don't know how I have got infected. (NH_IDI_New Patient_2)*

For this case, the respondent even did not believe whether they had anthrax or not. Few of the participants from the study areas informed that Anthrax is the new disease in their areas. They didn't see this type of sign and symptoms in their previous. They got informed from the doctors that the cows and goats died because of anthrax disease. One of the participants said that,

> *Suddenly the cow became sick and lying down. We slaughtered immediately. Local people bought the meat. We didn't know that it causes for anthrax diseases. After slaughtering and handling meat few people suffered for wound on their hands and mouth. (NH_IDI_LA_03)*

As anthrax is not serious for human so community people don't care to slaughter sick animals.

Anthrax vaccination program and challenges:

District and Upazila Level livestock officials informed that anthrax vaccine need to apply once in a year. Upazila Livestock Office (ULO) provides the vaccines through Bangladesh Livestock Research Institute (BLRI). In the last year the ULO office vaccinated about one lac thirty thousand cattle and goat. Moreover, in the first 4 months of 2020 (the study year) the ULO has vaccinated fifty thousand livestock. Due to the side effects of having vaccinated the livestock feels swelling and in some case goats die. As a result, many owners do not want to give vaccine to their livestock. This is a big challenge for the ULO or vaccine providing officers. One of the key informants informed that,

> *we can't cover 100% livestock under vaccination. Even we can't take pregnant animal under vaccination. One Key informant said that we face challenges from the field level that people are not interested for vaccinating to their small ruminants.*

Arrangement of proper transportation facilities from the storage centers to community found to be another challenge that reported in the study. As of the key informants stated

> *We have vaccine storage facilities but vaccine transportation is a main constrain. For easy carrying transporter sometimes don't use ice in cool box.*

ULO usually announces or informs about the vaccination program using a variety of communication channels including Mosque or public announce by mike. They schedule a time, date and place prior to starting the vaccination program. Vaccinator visited the household to inject the vaccine. Sometimes they arrange vaccination camp where villagers come with their livestock specially goats to inject vaccine.

As discussed earlier, side effect or after effect of getting vaccinated is another major challenge from demand side. It was informed from the community that, people are not interested to inject anthrax vaccine. Community people fear to lose their livestock after injecting vaccine. Moreover, some farmers were concerned that vaccinating lactating cows would decrease milk production. It was also informed that community people can't

remember when they vaccinated their livestock and when the next date. Moreover, the owners who have multiple livestock, they usually do not give vaccine to all livestock at same time. So the problem arise when they can't remember which livestock was under vaccination program.

Timing and decision of getting vaccine are two interlinked barriers for not having a wise coverage of vaccination program. The respondents of FGD and IDI frequently mentioned that male person do not remain at home due to their work in the day time. As there is a cost involve with having vaccine, the female cannot make decision to inject vaccine to their livestock as money is related there.

Another constraint was the difficulties faced when handling the cattle. It was also found that most of the farmers don't have knowledge on anthrax vaccination. It was also found from the community that there are lack of doctor and vaccinator. People can't get vaccine easily. Moreover, it was also revealed that there are shortage of human resources to cover the whole area for vaccination.

Popular beliefs of community people on vaccination

Our study revealed that community people believed that the vaccine made their animals sick instead of protecting them from anthrax. According to them, cattle especially goat continued to die even after being vaccinated. Therefore, community people did not consider the vaccine to be effective in protecting their animals.

Moreover, there were usually no clinical signs observed before the cattle died, most animals at risk or may already have been infected such that once vaccinated, some of those already infected succumbed to the disease as the vaccine itself is a live attenuated strain. Because of these beliefs, most farmers avoided taking their cattle for vaccinations because of fear of losing them from anthrax. Community members had a negative attitude towards the anthrax vaccine because they believed that the vaccine was not effective in protecting their cattle against anthrax. Therefore, they were not willing to have their cattle vaccinated.

Discussion

Anthrax knowledge, attitudes, and practices among the community people are not well known. In this study we intendant to identify risk factors in the community, vaccination program, we sought to collect exploratory data to develop of targeted interventions to reduce both animal and human anthrax. We have explored the factors that might increase the animals at risk of anthrax infection and how these factors may cyclically increase animal infection. Limited vaccine coverage and slaughter of anthrax infected animals permits the recurrent anthrax outbreak in animals and anthrax infection to human. Moreover, improper disposal of butchering waste and carcasses in the environment where livestock raise and graze also increase the chance of repeated anthrax outbreak.

Anthrax spores can cause new infections when animals are exposed to anthrax contaminated soil or when animals graze or/and feed from the contaminated environments. We have informed slaughtering anthrax-infected livestock in the cowsheds, backyards, and household premises, which could be potential sources of anthrax infection. As community people raise cattle as a major financial asset, owners slaughtered anthrax infected livestock and sell meat to minimize the loss of their investment. Among the Muslims, sick animal meat is not prohibited, so immediately they slaughter for food.
In the similar study investigators found anthrax spores in the soil where anthrax-infected animals were slaughtered and in the animal bones that were found at the site, (Fasanella, Garofolo et al. 2013) suggesting that spores stay viable in the environment where anthrax-infected livestock were slaughtered and where dead animals or their carcasses have been discarded.

Anthrax-infected carcass discarding in the environment permit the vegetative cells of B. anthracis to form spores and contaminate the environment (Dragon and Rennie 1995). In studied area, there are lack of knowledge to dispose carcasses.

Anthrax outbreaks among animals have frequently occurred in grasslands where a common source of infection is grazing on grasses grown in soil contaminated with anthrax spores, which may retain their infectivity for many years (Ashford, Perkins et al. 2000, Ndiva Mongoh, Dyer et al. 2008). Moreover, rainwater may collect and gather spores in

low-lying pastures, and contaminate fresh feed such as new grass and green rice straw. In the outbreak communities, the most common sources of feed for the infected cattle were grasses and straw grown in local fields or bring grass at home from the pastures. Farmers graze cattle in low-lying pastures which flood every year to reduce the need to purchase supplementary feed for their cattle and therefore minimize their production cost. Another potential source of anthrax could have been concentrated feed produced from anthrax-infected carcasses (Suverly, Kvasnicka et al. 2001).

Insufficient supply of anthrax vaccine, lack of staffing for vaccination, and an ineffective vaccine strategy that fails to target the highest risk areas, has left livestock susceptible to anthrax infection. Although the official price per dose of anthrax vaccine is low, a post outbreak ring-vaccination strategy is often implemented in high risk areas due to staffing shortages. However, the live-attenuated vaccine can only protect an animal effectively for 69 months; therefore, vaccinated cattle are susceptible again during the next year (Ndiva Mongoh, Dyer et al. 2008). In addition, livestock officers are reluctant to visit low-income communities and remote rural areas that are at risk due to the insufficient travel allowances for vaccination.

Overall anthrax knowledge was relatively low among the livestock raisers that have decades of experience and have a somewhat high proportion of exposure to both human and animal anthrax. Steps to control anthrax should be intended at breaking the cycle of anthrax infection (Opare, Nsiire et al. 2000). Repeated outbreaks of anthrax among domestic ruminants have been reported in these outbreak districts since the 1980s which indicates anthrax spores are likely to be present in the environment (Samad and Hoque 1986).

Limitations

We have conducted this study in one Upazila of Bangladesh. We could get more information if we could conduct study in other Upazila where Anthrax prevalence is less now. We did not ask economic or wealth indicator questions, which may have greater impact on practices. Additionally, the limited characteristics on which matching occurred could have led to confounding factors, such as the impact of herd size.

Recommendations

We have to consider the recommendation suggested by the study participants as they faced regarding Anthax infection among the animal and human. This study will help lessen anthrax infection in the studied areas if we can go for successful interventions.

1. Design and implemented education intervention to increase knowledge on Anthrax, pathways of anthrax infection, preventive measures and link the infected patients to the health service centers. Developing and distributing IEC materials should be integrate into this intervention.
2. Provide training to the community people regarding livestock raising, and about other rules like, feed the cattle, vaccination, medicine, slaughtering livestock, carcass disposal etc.
3. In such an areas where anthrax outbreak is recurrent, the Government should offer free animal vaccination to achieve close to 100% turnout.
4. The community members should be educated against traditional beliefs, myths and practices that pose a risk of anthrax like boiling meat severally, buying meat from the neighbors whose livestock has sick.
5. The capacity of Veterinary and Medical workers should be strengthened in diagnosis of zoonotic disease for early outbreak detection and subsequent interventions.
6. With availability of resources, additional studies be extended to other regions to compare findings and institute wholesome intervention measures of the disease. Further studies can also be done in Gangni, Meherpur to isolate anthrax spores in the soil.
7. Need community awareness like small meeting, 'Uthan Boidhok' with animal raiser to sensitize regarding anthrax. To fruitful the awareness program we can include local government, local influential people, school teacher.
8. Need regular training to the animal vaccinator to keep update.
9. Government should take policy to improve anthrax vaccine to minimize the reaction after vaccination, as vaccination site sallow and sometime causes death.

10. Need to improve the vaccine transportation facilities as they have to carry vaccine through cool box from central storage place to remote areas, sometimes career face problem with ice. Moreover need to improve peripheral storage systems.

Field work at a Glance






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