TANZANIA VETERINARY ASSOCIATION

PROCEEDING OF THE 35 SCIENTIFIC CONFERENCE OF THE TANZANIA VETERINARY ASSOCIATION HELD AT AICC ARUSHA, TANZANIA ON THE *5TH TO 7TH* DECEMBER, 2017

Volume 35 2017 ISSN 0856 - 1451

All correspondences should be addressed to:
Editor, Tanzania Veterinary Association, P.O. Box 3021, Chuo Kikuu, Morogoro, Tanzania.
e-mail: nongahezron@yahoo.co.uk OR zmakondo@gmail.com

Instruction to authors are provided on the inside of the back cover of every issue of the Tanzania Veterinary Journal

Publishers: Tanzanina Veterinary Association.

Knowledge, perceptions and practices regarding brucellosis in pastoral communities of Kagera Region, Tanzania

J. B. Ntirandekura[1], L. E Matemba.[2], H. A. Ngowi [1], S. I. Kimera.[1] and E. D. Karimuribo [1]

[1]Sokoine University of Agriculture, College of Veterinary Medicine and Biomedical Sciences, Department of Veterinary Medicine and Public Health, Morogoro, Tanzania; [2]National Institute for Medical Research, Morogoro, Tanzania.
Email: bojenti2010@gmail.com

SUAMMARY

A cross-sectional study was conducted in June 2017 to assess the knowledge, perception and practices of brucellosis by pastoralists of Kagera ecosystem, Tanzania using qualitative methods. Five focus group discussions of six participants were conducted with livestock farmers, administration leaders, religious representatives and youth. In addition, discussions with three key informants were conducted, involving officials of livestock, wildlife and public health department in each district. Data were analyzed using content analysis with inductive and deductive methods. This study revealed low knowledge regarding brucellosis by interviewees. Although participants recognized brucellosis as a zoonotic disease, they seemed to consider it of less importance. In addition, participants had low knowledge on causes, symptoms and mode of transmission of this disease. However, they perceived the interactions between humans, livestock and wildlife together with the neighborhood with other countries to be potential risks for introduction of brucellosis in their communities. Moreover, their habit of drinking unpasteurized milk, the lack of protective gears assisting animals giving birth and poor vaccination program need to be improved by community health education. A coordinated one Health approach is needed and further studies are suggested to reveal the status of brucellosis in Kagera ecosystem to guide its control and prevention.

Key words: Knowledge, practices, brucellosis, pastoral communities, Kagera, Tanzania.

INTRODUCTION

Brucellosis is a worldwide zoonotic disease for both public health and economic importance, affecting humans, livestock and wildlife. Brucellosis has a worldwide distribution where Africa continent is one of the endemic areas (Corbel, 1997). This infectious disease causes important losses and human burdens in infected zones (Boschiroli *et al.*, 2001). Different *Brucella* species are identified as causative agents of brucellosis and some of them are known to be pathogenic to humans: *B. abortus, B. canis, B. inopinata, B. melitensis, B. pinnipedialis, and B. suis* (Tiller *et al.*, 2010; Zheludkov and Tsirelson, 2010; Whatmore *et al.*, 2014). It is known that brucellosis is endemic in several areas in East African region (Chota *et al.*, 2016) and it reduces productivity through abortions and weak offsprings; causing a major threat in national and international livestock trade.

In Tanzania, some previous studies have reported existence of risk factors for brucellosis transmission in pastoral communities such as occurrence of abortions in herds, assistance of animals during parturitions, individuals living in close proximity with livestock and animal slaughtering occupation (Swai and Schoonman, 2009; John *et al.*, 2010; Assenga *et al.*, 2016). Brucellosis is associated by many communities to people who drink raw-milk/ animal blood, consume raw meat; or to those who share a bed or utensils with brucellosis patients (Mubyazi *et al.*, 2013). Lessons learnt from public and local knowledge, perceptions and practices regarding infectious diseases and other communicable diseases in selected areas of Tanzania demonstrated higher understanding by pastoralist of the existences of a number of certain diseases transmitted between humans and animals (Swai *et al.*, 2010; Mangesho *et al.*, 2017). Moreover, livestock keepers could recognize abortions, emaciation, a drop in milk production and fever as clinical signs associated with brucellosis (Shirima, 2005). Despite the good perception and knowledge of common diseases circulating in their area, livestock farmers needs to improve their practices to control those diseases, which most of the times leads to failure at individual and national levels (Chengula *et al.*, 2013). The activities undertaken for controlling brucellosis, may involve the capacities for detection of the disease, the participation of the stakeholders for mass vaccination or culling; the epidemiosurveillance system based on the perception of the risk for the humans, livestock and wildlife in the ecosystem. Despite their knowledge and perception of the threat caused by certain diseases in their communities, pastoralists adopt some cultural behaviors which

could favor the transmission of infectious disease in the localities (Musallam *et al.*, 2016).

The understanding and the eradication of brucellosis, needs a characterization of the disease, the multidisciplinary actions from different stakeholders in the infected zones (Zinsstag *et al.*, 2005). Also, the transboundary transmission of zoonotic diseases may be considered and be evaluated from the local understanding of communities; this reinforced by cross-border molecular tracing which can confirm brucellosis as a zoonosis of concern for regional public health (Gwida *et al.*, 2012). Little is known about the local understanding of brucellosis by pastoralists in Kagera, Tanzania. This study was conducted to assess the knowledge, perception, and practices regarding brucellosis of different stakeholders in the pastoral communities of Kagera Region; an ecosystem located on borders between Tanzania, Burundi, Rwanda and Uganda.

MATERIALS AND METHODS

Study area

This study was conducted in two districts namely Karagwe and Ngara, of Kagera Region, in north-western part of Tanzania. Livestock contributes significantly to the economy of Kagera region, and animals are exported to neighboring countries (Ministry of Livestock and Fisheries Development, 2011). According to National Sample Census of Agriculture report of 2012, cattle population in Kagera region was 837,204. Other animals were 593,607 goats, 53,061 sheep, 44,402 pigs, 1,005,415 poultry, 2 water buffaloes, 15,627 rabbits, 40,471 dogs, 159 donkeys, 18 horses and 6,629 cats. Dairy farming is spread throughout the Region with an estimated 21,438 dairy cattle. Kagera ecosystem is subdivided into three agro-ecological zones (Lake Shore and Islands, Plateau Area and Low land) in which crops grown are mainly bananas, cassava, beans, maize, coffee and tea. The area has game reserves such as Kimisi and Burigi in which zebras, impalas, buffalos, elephants, giraffes, leopards, hippos and crocodiles can be found. Health facilities are distributed in all districts and various transport means link Kagera to other regions and neighboring countries particularly Burundi, Rwanda and Uganda. The climate is equatorial with temperatures ranging between 20°C and 28°C. Kagera Region, in general has rainfall ranging between 900 - 2,000 mm per annum.

Study design

A cross-sectional study design was used to assess the knowledge, perception and practices of brucellosis by the pastoral communities of Kagera in June 2017, using a qualitative research method.

Participants selection and data collection procedure

Two focus group discussions (FGDs) and one Key Informants Interview (KIIs) were conducted in Ngara district, while three FGDs and one KII were done in Karagwe district. Each FGD involved a minimum of six persons selected purposively: three farmers, one person from local administration, youth representative, and one person from religious confessions. Discussions in KIIs involved three persons of government officials from animal health, public health and wildlife departments at each district level. Participants were originated from five villages selected purposively (urban, peri-urban and rural areas) to get a variation of insights on brucellosis from different people according to their location. FGDs and KIIs approaches were combined to get coverage of information from experts and non-experts regarding brucellosis disease.

The FGDs and KIIs were conducted in the respective communities of the participants; i.e, ward executive and district official's offices (hospitals). Digital recording by mobiles phones was used to record discussions and to take pictures. FGDs were conducted in Swahili language by a facilitator, while interviews with KI were conducted in English by the researcher. The interview guide was structured around four main themes as follows:

(i) Perception of brucellosis by the population in Kagera ecosystem: Participants were asked about the local name of brucellosis, existence of the disease in their locality. The knowledge on the causes, the presenting symptoms, and the mode of transmission of brucellosis were also assessed. Furthermore, the socio economic impact and the prophylactic approach of this zoonotic disease in the ecosystem were discussed.

(ii) Risk factors for brucellosis prevalence in Kagera ecosystem,

(iii) Potential for transmission of brucellosis in Kagera ecosystem due to neighboring with other countries

(iv) Roles of different stakeholders in the ecosystem in the control of brucellosis.

The facilitator introduced the aim of the study, explaining each theme clearly to participants. The discussions lasted for approximately 45 minutes. For the KIIs, the interviews were conducted in

English by the researcher and both FGDs and KIIs groups were asked the same questions.

Data analysis

Data recorded from FGDs were transcribed verbatim to Microsoft Word and later translated from Swahili to English. The coding of the categories was done manually using Microsoft Excel inasmuch as, the data were small and themes and sub themes were identified. Later the content analysis was done with inductive and deductive methods based on the categories grouped in different themes and subthemes as well as emerging themes. Themes and subthemes were analyzed in their chronologic order of inquiry.

Ethical considerations

This study was approved by institutional review board of Sokoine University of Agriculture, and ethics clearance was also obtained from the Medical Research Coordinating Committee of the National Institute for Medical Research (ref: NIMR/HQ/R.8a/Vol.IX/2456). Verbal consent was obtained before conducting each FGD by all the team members. For confidentiality matter, participants were ensured for none use of their names during analysis, report or publication. Approval by participants for recording and taking pictures was requested before starting this activity.

RESULTS

Socio-demographic description of the participants

Thirty seven participants from six villages of Karagwe and Ngara districts were recruited to participate into Focus group discussions. The mean age of the participants was 49 years with a standard deviation of 10.55 and 30.55% of participants were females. The focus group discussions involved farmers, youth, religious leaders and local administration representatives. Four of the participants had no formal education, 21 had primary education, and 12 had secondary school or higher education. Key informants interviews were conducted in group of three individuals from public health, livestock and wildlife departments at district level (Table1). All the key informants were degree holders.

The knowledge and perceptions on brucellosis by the pastoral communities of Kagera ecosystem

The understanding brucellosis among the study participants in Kagera Region was not direct because some of them confused this disease with the "abortion process". In Tanzania, brucellosis is normally known in Kiswahili as "ugonjwa wa kutupa mimba" meaning the "disease of abortion". The facilitator had difficulties to get the right words in local language to signify "brucellosis". Describing the disease to participants, the term abortion was used as a prominent symptom; but, it wasn't enough to differentiate brucellosis from other abortive diseases which people are accustom to see or to report in humans and their livestock. Explanations and discussions were needed to make participants understand the phenomena of abortions, which was influencing much the answers given in the focus group discussions conducted in the two Districts.

Participants gave different local names of brucellosis: Amakole, Omwizi, Entandago, Kuramburura, and Kururumura. However, the most common local name of brucellosis used in the two districts was "Kutoroga".

Also, the existence of brucellosis in their locality, as well as the zoonotic nature of the disease was recognized by all the groups who participated in this study. However, participants provided different causes of brucellosis. Five groups out of seven believed that brucellosis is caused by seasons (three groups mentioned dry season and two groups mentioned rain seasons), while three groups said that brucellosis is caused by other diseases (malaria, foot and mouth disease. One group mentioned vectors (tsetse flies, mosquitos), age, contaminated water, drought and famine as causes of this disease.

> "*..... Few days ago, I was a farmer this disease can occur when the cattle drink contaminated water with bacteria. Also dry season causes abortion because of high temperature. There are so many causes' including different diseases. That's what I know*." (FGD Bweranyange- Karagwe District).

Six out of seven groups mentioned abortion as a symptom of brucellosis in humans and livestock. Other symptoms in humans mentioned were fever, tiredness, skin changes, and the two key informants groups insisted on the fact that brucellosis may have a resemblance of symptoms with other febrile diseases such as malaria.

In livestock, participants mentioned additional symptoms of brucellosis such as fever, hygroma, vaginal discharges, skin changes, inappetence, orchitis, tiredness, general weakness and coughing. Only one group of key informants mentioned hygroma as symptom of brucellosis observed in wildlife.

> *"The signs are the same, cattle can feel like fever, then hair rise up and blood start to come out, and abortion can occur almost within two days. We as farmers are very accustomed to the problems of cows than those riches (cattle owners) who give us the cattle to graze for them"* (FGD conducted in Nyakasimbi-Karagwe District - farmer).

Table1. FGDs per District and locations

District	Village	Characteristic	Participants		No. of FGDs conducted
			Female	Male	
Karagwe	Bweranyange	Rural area participants	1	6	1
	Nyagasimbi	Rural area participants	1	5	1
	Nyakahanga	Urban and peri-urban area participants	2	4	1
	Kayanga	Officials from Livestock, Public health and wildlife department	1	2	1
	Benako	Rural area participants	3	3	1
Ngara	Ngara mjini	Urban and peri-urban area participants	2	4	1
	Ngara	Officials from Livestock, Public health and wildlife department	1	2	1
Total			1	26	7

Mode of brucellosis transmission also retained the attention of participants when they mentioned different ways in humans: consumption of uncooked meat and unpasteurized milk, sexual intercourse and unprotected assistance of their animals during parturition. In addition, they mentioned the poor disposal of aborted materials and placentas. In livestock, participants centered the transmission of brucellosis on the sharing of pasture and water between domestic animals and wildlife, the physical and sexual contact between animals, vectors (mosquitos and tsetse flies) and contact with vaginal discharges of infected animals. Two groups mentioned the interactions between animals and the dissemination of vaginal discharges as source of contamination of brucellosis in wildlife.

> *"In animals, the transmission can be due to the increase of the number of cattle in the same area where self-infection between those cattle can occur; or, if the livestock is not well vaccinated, also during the sharing of pastures with those cattle which are not vaccinated well. It may happen that you perform vaccination very well but the problem becomes on sharing pastures with others who have some diseases. This may result in the transmission of some diseases which you cannot recognize"* (FGD - Nyakahanga-Karagwe District Farmer1).

Throughout the discussions, the participants talked about the social impact of brucellosis in their localities. Three out of seven groups believed that brucellosis could affect their willing of raising animals and could lose their faith in their marriage. In addition, the economic impact of brucellosis was pointed on the issue of the loss of milk production, unnecessary expenditure to cover the treatments (incomes decrease), which could also contribute to the inability to pay school fees for their children. All the groups converged to say that brucellosis decreases the total number of livestock. Furthermore, participants highlighted the negative impact of brucellosis on their health through the loss of pregnancies, the deaths and the nutrition problems due to the decrease of milk production.

> *"Maybe on medical aspect, first of all, if you fail to diagnose brucellosis timely, you will not treat correctly and result into an avoidable death, if you treat wrongly the patient, thinking that maybe is malaria or typhoid while is not, the outcome of improper*

treatment is bad consequences to the patient, like death; and misuse of medicines" (KII1- Ngara District).

"… but this problem can cause the fall of production for both animals and humans." (Cheikh - FGD Ngara District).

Regarding the prophylactic approach for brucellosis, focus group participants agreed that women actually are seeking in general for medical care in health centers and hospitals. Key informants groups specified the use of antibacterial drugs such as doxycycline and rifampicin as treatment options in case of suspicion of brucellosis, even if according to them, some of these drugs particularly rifampicin were commonly used to treat tuberculosis. For livestock sector, farmers in all groups attested to call for veterinary services, also they confirmed buying drugs themselves and rarely applying for vaccination program. The use of traditional medicine to treat brucellosis in livestock and humans in case of abortions was mentioned by two groups during discussions.

"Ah no, when you suspect something even if it is not yet confirmed, but if you see that it is likely to be, you start to treat. So alternatively, we use doxycycline; even if it is not available in the hospital, in the pharmacies, it is available" (KII1 Ngara District).

"Here the government has never provided such vaccine or medicine but ourselves when the problem happens, we go to the pharmacy to buy some medicines for treating our livestock. But about prevention cases from the government; we didn't receive any." (FGD Bweranyange- Karagwe District farmer2).

Risk factors for brucellosis in humans, livestock and wildlife

The important risk factors for brucellosis mentioned by participants (five groups) were: a movement of livestock and wildlife in the ecosystem, the sharing of pastures and watering points between wildlife and livestock.

"….because most of the people who are living here close to this Kimisi game reserve are involved in movement in game reserve. They take their livestock to graze inside the game reserve. So, their interaction with wildlife can increase the disease. So, these animals can cunningly increase the risk" (KII- Karagwe District-wildlife official).

KII groups recognized the existence habits of drinking unpasteurized milk, poaching and the poor disposal of aborted material (placentas and aborted materials are thrown in the environment or given to dogs) as major risk factors for brucellosis in humans in the communities. Climate change, consumption of uncooked meat and sexual intercourse (favored by the movement of people in the ecosystem) were also reported as risk of introduction of brucellosis in the study area by two groups.

The risk for transmission of brucellosis in Kagera ecosystem due to neighboring with other countries

Six groups stated that the interactions observed on borders between livestock and wildlife and the existence of games reserves on borders constitute a risk for transmission of brucellosis from others countries. Furthermore, the existence of movement of people crossing borders for pastoralism and business (commercial activities), the migration of people (sites for refugees) were evidenced by different groups as potential risks for the introduction of brucellosis from neighboring countries.

"During the conflicts war in Rwanda and Burundi I was here and during that time I was keeping goats but this disease was already there before the refugees came here. But during that period there are some refugees who brought some cattle and used to sell it to indigenous people but there were no any benefit from this, because all of them died. We are not sure if those cattle died because of this disease or if the problem was the climate changes they faced once they arrived here. But I think the problem was the environment, they were not support the weather. After the refugees returned to their home, the process of keeping animals increased in high percent and lobbers of cattle increased also." (Pastor in FGD in Benako- Ngara District).

During the discussions, five groups mentioned also the uncontrolled movement of wildlife on borders (wild animals don't know borders) to be a risk of introduction of brucellosis from a country to another.

The role of different stakeholders in the ecosystem in the brucellosis control

Actually brucellosis is not controlled in the pastoral communities of Kagera. Little is being done for the