

Full Length Research Paper

Knowledge, Attitude and Practice of Workers on Bovine Tuberculosis (bTB) in Two Abuja Abattoirs, Federal Capital Territory, Nigeria

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Abstract

Bovine tuberculosis is a disease caused by *Mycobacterium bovis* with significant impact to cattle, public health and international trade. The disease is endemic in Nigeria which led to this study in order to estimate the knowledge, attitude and practice of abattoir workers relating to bTB. Questionnaires were administered to 156 butchers and meat handlers out of which 115 (73.8%) were men and 41 (27.2%) were women. Using bivariate analysis, the following were significant (P -value ≤ 0.05); the length of time worked at the abattoir [Odds Ratio (OR) = 3.4, 95% CI = 1.6-7.4], knowledge of mode of transmission (OR = 2.4, 95% CI = 1.1-5.1) and Potential risk associated with your job (OR = 2.4, 95% CI = 1.1-5.0). Additionally, the poor knowledge of bTB was significantly associated with the drinking of fresh milk (OR 0.4, 95% CI 0.2- 0.8), milk not boiled before drinking (OR 0.4, 95% CI 0.2- 0.9), Seen a bovine tuberculosis lesion in your slaughtered animal (OR = 0.2, 95% CI = 0.2-0.5), What's done to lesion (OR = 2.2, 95% CI = 1.0-4.8) and Do you consume meat with these lesions (OR = 2.2, 95% CI = 1.1-4.7). Multivariate analysis showed that length of time worked at the abattoir [Adjusted Odds Ratio (AOR) = 3.45, 95% CI= 1.3-9.0], and whether seen a bovine tuberculosis lesion on your slaughtered cattle (AOR = 0.29, 95% CI= 0.1-0.7) were significant by the level of knowledge. Conclusively, Butchers and meat handlers have an increased risk of exposure due to consumption of meat with lesion of tuberculosis and what is done when they come across lesion of bTB due to the inadequate knowledge of the disease and its mode of transmission. Butchers and meat handlers should be encouraged to seek for medical attention early when a cough persists.

Key words: Bovine tuberculosis, butchers, abattoirs, knowledge, attitude, practice, Nigeria

Introduction

Bovine tuberculosis (bTB) is a chronic disease of cattle caused by *Mycobacterium bovis*. The disease has a significant impact on the international cattle trade, and – as it is a zoonotic disease – implications for animal and public health. Today, some of the world's developed countries have been certified to be bTB-free, whereas bTB is still a serious challenge in most developing countries (Kwaghe *et al.*, 2015).

In developing countries, eradication of bTB is hindered by lack of funding, proper logistics and inadequate adherence to basic procedures such as antemortem and post-mortem inspections (Kwaghe *et al.*, 2015). Effective control and management of bTB is essential to eliminate the disease. The battle against bTB in developing countries is far from being over due to reasons earlier stated. In developing countries, the number of laboratories that can diagnose bTB is limited, and diagnosing the disease in humans stops at the smear level making it impossible to estimate the role of *M. bovis* in human infections. There is also the scarcity of data on bTB in the developing countries, which influences the control of the disease (Kwaghe *et al.*, 2015).

Various reports which include recent and old reports from the country's abattoirs and other field activities have confirmed the presence of bTB in all parts of Nigeria (Ayanwale, 1984; Dusai and Abudullahi, 1994; Cadmus *et al.*, 1999; Cadmus *et al.*, 2004; Kwaghe *et al.*, 2011; Opara *et al.*, 2012; Ejeh *et al.*, 2014). In Nigeria, zoonotic tuberculosis owing to *M. bovis* is said to account for 5% of all cases of tuberculosis in humans and up to 3% of cases in children less than 5 years of age (Ofukwu, 2006).

The knowledge, attitude and practices of butchers and meat handlers was assessed in this study in order to verify the status of bTB among these group of individuals that are at a high risk of contracting the disease and to come up with methods that will aid in the control of the disease.

Materials and Methods

Questionnaire Administration

Questionnaires were administered to 156 butchers and meat handlers in Karu and Kubwa abattoirs in Abuja. The administration of the questionnaires was based on oral interview. Purposive and snow ball sampling was used in the administration of the questionnaires. The questionnaires were pre-tested in Lafiya main abattoir located in Nasarawa state and dully corrected and made suitable for the study before the questionnaires were used for the study. Interviews were conducted on eligible participants for data acquisition. Data was collected within the span of a month (March, 2013).

The questionnaire was structured to contain information to assess the level of awareness and risk factors that are associated with bTB infection. It was also structured to contain specific variables such as; demographic variables (name, age, sex, marital status, educational qualification, duration of work at abattoir and number the of people living in residence); knowledge of the disease (mode of transmission, keeping animals and other animal hosts); work related exposure factors(eating and drinking at work place, frequency of drinking unboiled fresh and sour milk, consumption of meat with lesion, practice upon seeing organ with tuberculous lesion); medical history (history of persistent cough and duration, family history of tuberculosis treatment and BCG administration); preventive practices (history of receiving training and willingness to receive more training). The questionnaire that was administered composed of open and closed ended questions.

Data Management and Analysis

All completed questionnaires were reviewed on the field to ensure it was administered correctly by the interviewers. Data obtained from the open and closed ended questions were coded according to the method of Thrusfield, (1997) and analyzed using Microsoft excel and Epi info 7 version. A total of 156 questionnaires were administered and all the study participants responded appropriately giving a response rate of 100%. The analysis of the data was done in a step wise manner; univariate, bivariate and multivariate analyses. To perform multivariate analyses, an unconditional logistic regression model was developed using the —step-up approach. The study results are presented in different sections in line with the specific objectives of the study. Descriptive and inferential statistics were used to summarize the data obtained (percentage, 95% confidence interval, mean, standard deviation). The level of knowledge of disease was compared across the investigated variables using odds ratio. Test results were considered as significant if p-value was ≤ 0.05 . Factors that were found to be significant in the bivariate analyses were subjected to multivariate analyses to control for confounding and effect modification. Tables and figures were used for an all-inclusive presentation of the results.

Ethical Considerations

Approval for this study was obtained from the Federal Capital Territory Health Research Ethics Committee as well as the Scientific and Ethical Committee of the Ahmadu Bello University Teaching Hospital, Zaria. Permission was also obtained from the Management of each abattoir where the study was carried out. Informed consent was obtained from each eligible abattoir worker before questionnaire administration. Confidentiality of information obtained was assured and maintained.

Results

Out of the 156 Butchers and Meat handlers on whom the questionnaire was administered, 115 (73.8%) were men and 41 (27.2%) were women. The proportions of the various abattoir workers in the category of each variable investigated during the course of this study are shown in Table 1 below. Majority of the participants fell within the age group of 18-25 (39.1%) years. Table 2 indicates the knowledge of the diseases 53.2% with a mean score of 5.5, Work related exposure factors (75%) with a mean score of 8.8, medical history (42.3%) with a mean score of 1.46 and preventive practices (21.8%) with a mean score of 1.2.

The odds ratio revealed the following:

Those that worked at the abattoir for greater than 6 years were associated with 3.4 times increased risk of exposure compared to those than worked for less than 6 years. Those that did not know the mode of transmission were 2.4 times more at risk of exposure than those that knew. Keeping animals at home was associated with increased risk compared to those that did not keep animals at home. Lack of awareness of disease in wild animals is 1.4 times associated with increased risk compared to those that aware of disease in wild animals. Those that did not know the potential risk associated with their job were 2.4 times more at risk than those that knew. Those that did not eat or drink at place of work are 0.6 time associated with decrease risk of exposure compared to those that ate and drank at place of work (Table 3). Drinking fresh milk without boiling is 0.4 time more likely to be exposed than those that boil milk before drinking. Drinking sour milk increases the risk of exposure 1.2 time than not drinking. Those that saw lesion were 0.2 time more at risk than those that did not see lesion. Those that ignore lesion were 2.2 times associated with increased risk of exposure than those that called the attention of the meat inspector (Table 4).Consuming meat with lesion increases the risk of exposure 2.2 times than those who do not consume meat with lesion. Having or had persistent cough increases risk of exposure 1.8 times compared to those that do not have or never had persistent cough. No BCG vaccination or not receiving training on bTB were 0.7 and 0.8 time respectively associated with increased risk of exposure than those that have been vaccinated or have received training on bTB (Table 5).

Bivariate analysis showed the following to be significant at p-values of ≤ 0.05 : length worked at the abattoir >6 years, do you know the mode of transmission, potential risk associated with your job, do you drink fresh milk, do you boil your milk before drinking, seen a bTB lesion in your slaughtered animal, what's done to lesion, do you consume meat with these lesions (Table 5).

Two factors – working at the abattoir for over 6 years [Adjusted Odds Ratio (AOR) = 3.5; 95% Confidence Interval (CI) = 1.3 – 9.0, p = 0.01] and seeing lesion in slaughtered animal [AOR = 0.3; 95% Confidence Interval (CI)=0.1-0.8, p=0.01] remained statistically significant when multivariate analyses was carried out among all factors that were significant at Bivariate analysis. However, there was no association found between Knowledge and other variables investigated (Table 6).

Table 1: Demographic characteristics of butchers and meat handlers at two abattoirs in FCT, North Central Nigeria

Characteristics	Female (n=41)	Male (n=115)
Age (Mean and Standard Deviation)	25.5 ± 5.3	30.5 ± 9.4
Marital Status		
Single	18(43.9%)	35(30.2%)
Married	20(48.8%)	80(69.8%)
Divorced	0(0%)	0
Widowed	4(9.6%)	0
Educational Status		
Primary	22(53.6%)	45(39.1%)
Secondary	18(43.9%)	60(52.2%)
Tertiary	1(2.4%)	3(2.6%)
Others (Qur'an)	0	7(6.1%)
Length of work at abattoir		
1 -2 Years	27(65.8%)	20(17.4%)
3 – 5 Years	3(7.3%)	30(26.1%)
>6 Years	19(46.3%)	57(49.6%)

Table 2: Assessment of Questionnaire

Variable	Mean score	Percentage (%)
Knowledge of the Disease	4.5	53.2
Work related exposure factors	8.8	75
Medical history	1.46	42.3
Preventive practices	1.2	21.8

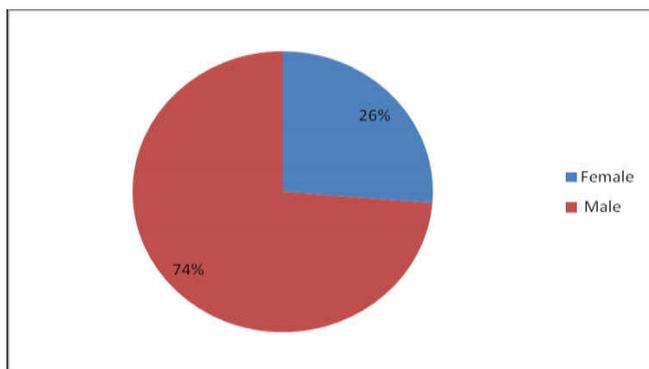


Fig 1: Sex distribution of butchers and meat handlers at the two abattoirs in F.C.T, North Central, Nigeria

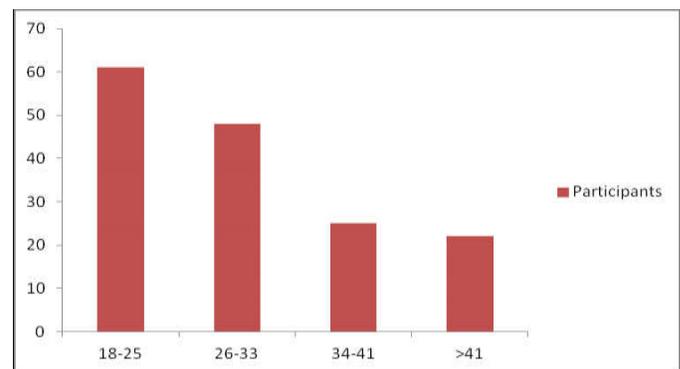


Fig 2: Age distribution of Butchers and meat handlers at the two abattoirs in F.C.T, North Central, Nigeria.

Table 3: Bivariate analysis of risk factor for bTB in butchers and meat handlers in two abattoirs in FCT, North Central, Nigeria

Variable Exposure	Odds Ratio	Confidence Interval [CI 95%]	P - value
Length worked at the abattoir >6 / <6 years	3.4	[1.6 -7.4]	0.001*
Do you know the mode of transmission- Yes/ No	2.4	[1.1-5.1]	0.02*
Do you keep animals at home- Yes/ No	1.8	[0.8-4.6]	0.1
Are you aware of bTB in wild animals- Yes /No	1.4	[0.7-3.1]	0.2
Potential risk associated With your job- Yes /No	2.4	[1.1-5.0]	0.02*
Do you eat or drink at place of work- Yes /No	0.6	[0.2-1.4]	0.2

Significant (P-value ≤ 0.05)*

Table 4: Bivariate analysis of risk factor for bTB in butchers and meat handlers in two abattoirs in FCT, North Central, Nigeria

Variable Exposure	Odds Ratio	Confidence Interval [CI 95%]	P - value
Do you drink fresh milk- Yes/ No	0.4	[0.2-0.8]	0.006*
Do you boil your milk before drinking- Yes/ No	0.4	[0.2-0.9]	0.02*
Do you drink sour milk- Yes/ No	1.2	[0.5-3.3]	0.5
Seen a bTB lesion in your slaughtered animal- Yes/ No	0.2	[0.1-0.5]	0.0001*
What's done to lesion-call meat inspector/ Ignore	2.2	[1.0-4.8]	0.04*

Significant (P -value ≤ 0.05)*

Table 5: Bivariate analysis of risk factor for bovine tuberculosis in butchers and meat handlers in two abattoirs in FCT, North Central, Nigeria

Variable Exposure	Odds Ratio	Confidence Interval	P - value
Do you consume meat with these lesions- Yes/ No	2.2	[1.1-4.7]	0.03*
Have/had persistent cough- Yes/ No	1.8	[0.7- 4.2]	0.2
Vaccinated with BCG- Yes/ No	0.7	[0.3-1.4]	0.2
Received any training on BTB- Yes/ No	0.8	[0.3-1.7]	0.3

Significant (P -value ≤ 0.05)*

Table 6: Shows values of multivariate analysis of risk factors for bTB in butchers and meat handlers in two abattoirs in FCT, North Central, Nigeria

Term	Odds Ratio	Confidence Interval [95%]	P-Value
Length of Work	3.4705	[1.3340-9.0288]	0.0108*
Transmission	1.5010	[0.5949-3.7876]	0.3898
Risk to job	1.5534	[0.5793-4.1652]	0.3815
Drink fresh Milk	0.4643	[0.1895-1.1376]	0.0933
Boil Milk	0.8607	[0.3248-2.2813]	0.7630
Lesion in animal	0.2993	[0.1193-0.7512]	0.0102*
Action on lesion	1.2999	[0.5062-3.3385]	0.5857
Consume lesion	1.8299	[0.7445-4.4975]	0.1878

*Values that remained significant in the unconditional logistic regression model.

Discussion

Butchers and meat handlers had a fair knowledge of the disease (bTB) and its means of transmission (53.2%) which was far less than what was reported by Sa'idu *et al.*, (2015) in Bauchi, Nigeria, where 90.3% of the respondents were aware of the zoonotic nature of bTB. A study in Addis Ababa, Ethiopia, revealed a much lower knowledge of bTB among secondary school students where only 13.9% were aware of bTB (Kidane *et al.*, 2015) when compared to what was obtained in our study. Results indicate that 75% of the respondents believed in the work related exposure factor which had a mean score of 8.8 and the participants' prioritize the message pertaining to bTB. This study is related to the study of Sa'idu *et al.*, (2015), where there was significant ($P < 0.05$) association between awareness of the respondents (abattoir staff) of bTB and duration of exposure to cattle carcasses. The medical investigation had mean score of 1.46 and 42.3% of the respondents had a good medical history.

The assessment of preventive practices reveal a mean score of 1.2 and 21.8% claim to practices that are safe which is contrary to what was obtained in the report of Sa'idu *et al.*, (2015), where majority of them (Bauchi abattoir staff) believed in the importance of the use of protective clothing while working. Similarly, Mfinanga *et al.*, (2003), investigated the level of knowledge and prevailing practices in rural Tanzania and found that about 40% of respondents practice habits deemed to be high risk for exposure to bTB, while 75% exhibited poor knowledge of bTB. Other reports by Amenu *et al.*, (2010), documented the lack of accurate knowledge on transmission of zoonoses and the prevalence of risky behaviour, as consumption of raw animal products and unsafe slaughtering practices in a rural district in Ethiopia while Swai *et al.*, (2010), assessed the knowledge and practice of animal health workers and livestock keepers in Tanzania and concluded that there was inadequate awareness (53.2%) and lack of knowledge of zoonoses (46.8%) combined with food consumption habits and poor animal husbandry which are likely to expose respondents to an increased risk of contracting zoonoses.

The unhygienic and unwholesome practices of hiding infected products increase the risk of selling to the public infected and contaminated meat product. Over time and with repeated meat inspections butchers acquire ample knowledge about the nature of pathologies that can lead to condemnation of carcasses just from observing the activities of the Veterinary staff. Unruly butchers could obstruct inspection of their animal carcasses or hide lesions from unassisted inspectors. Similar findings of Cadmus *et al.*, (2008), in Nigeria, stating that pathological cases including zoonoses in slaughtered animals were missed due to uncooperative attitudes of butchers in ensuring thorough meat inspection.

One of the limitations of this study is that questionnaires were administered based on face to face interview with the respondents and it is more likely to include bias due to the fact that the respondent may likely give answers that the interviewer is more likely to accept. Secondly, the questionnaire was administered based on purposive and snowball sampling methods which may not be the true representative of the sample size required unlike when probability sampling method is used.

Conclusion and Recommendations

This study has shown that butchers and meat handlers have an inadequate knowledge of the disease, there was eminent work related exposures and preventive practices are not in use. Based on the findings of this study, the following recommendations are hereby suggested; government at all levels should organize public enlightenment campaigns aimed at highlighting the zoonotic importance of bTB among Butchers and meat handlers who are at high risk of acquiring the disease; butchers and meat handlers should be discouraged from eating raw meat and educated on adherence to safe animal-product handling practices; educate those involved in animal handling in any form on the need to adopt strict hygiene measures especially washing their hands properly with soap by using the electronic and print media; encourage butchers and meat handlers to seek medical care early to treat persistent cough, health education and the use of personal protective equipment by abattoir workers in preventing infection in those at risk.

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