Knowledge, Attitudes, and Practices of Avian Influenza among Poultry traders in Nigeria

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Abstract

Traders at Live Poultry Markets (LPM) are at increased risk of acquiring Avian Influenza (AI) infection through contact with sick poultry or their products. Concern exists that the potential AI transmission could lead to a pandemic especially from resource-constrained countries with weak health systems and veterinary services. We conducted a survey in 140 Nigerian poultry traders in traditional LPM enquiring on their knowledge, attitudes and infection control preventive practices regarding AI. Knowledge was inadequate and the infection was perceived to be a low occupational hazard. Wearing protective equipment and hand washing were not routine practices. In logistic regression models high educational level and risk perception were independent predictors of knowledge of AI with [Odds Ratio (95% Confidence Intervals)] 2.16 (1.03-4.54) and 5.36 (1.70-16.91)] respectively. Belief that AI is a preventable and serious disease independently predicted behavior modification practices 4.05 (1.28-12.81) and 3.24 (1.29-8.14) respectively. Knowledge of transmission and preventive measures should be improved. More effective information should be provided to this high risk group as well as improvements in infrastructure and working conditions to facilitate behavior modification.

BACKGROUND

Infection of poultry with influenza A (subtype H5N1) virus is responsible for outbreaks in birds and a cumulative human case-fatality rate of 60.5% has been reported to date (1). The most likely means of transmission is from infected birds to humans and from the environment to humans, but evidence for human-to-human transmission is limited. The virus can be transmitted if a person has direct contact with infected poultry or surfaces and objects contaminated by poultry droppings. The first case of Avian influenza (H5N1) reported in Africa was in Nigeria where it appeared at a commercial poultry farm in Kaduna State in early 2006. Subsequently, it spread throughout the country and a human case was reported in 2007. A multi-sectoral multi-component plan was developed and is being implemented for containing and responding to the epidemic, and for educating healthcare workers on diagnosis, detection, and prevention of AI spread (2). Workers in poultry trading, who commonly have contact with live, sick, or dying poultry, are at high risk for AI. These workers are at increased risk through contact, sale, slaughter, de-feathering and preparation of raw poultry products at Live Poultry Markets [LPM] (Figure 1). Concern exists that AI could be transmitted from uncooked poultry or their products to humans (3) and could lead to a pandemic especially from little prepared resource-constrained countries with weak health systems and veterinary services. This study evaluated the knowledge, attitudes, and infection control practices of poultry traders in Nigeria regarding AI.

METHODS

A total of 145 poultry traders and workers at the three major LPM in Zaria, Kaduna state, Nigeria were recruited into the study from March to April 2009 after obtaining approvals from heads of the LPM and individual consents from the respondents. Subsequently, the workers were interviewed in their workplace about socio-demographic characteristics, knowledge of transmission and prevention, attitudes towards AI, behaviors regarding use of preventive measures and barriers to use as preventive measures against spread of AI. A structured questionnaire used in a similar study in Italy (4) was modified, adapted and used for administration and data collection. Logistic regression analysis with adjusted Odds Ratio and 95% confidence intervals were derived with Stata software version 10. Variables which were associated in univariate analysis ($p \leq 0.2$) with a derived binary knowledge score, risk perception and work habit modifications were entered into logistic regressions and subsequently modelled with a backward stepwise approach using likelihood ratio

test (LRT). Only variables that significantly ($p < 0.05$) affected the model in LRT statistics were retained in the final models.

RESULTS

A total of 145 poultry traders and workers were interviewed (response rate 96.6%). Average age was 30 years (range 15 – 80 years), average duration of work activity was 12 years, and median time of exposure spent daily on poultry related activity was 8 hours. All the traders were males who were involved with selling (63%), slaughtering (11%) and de-feathering (26%) poultry. One half of the workers had a secondary school or university education.

Of the 140 workers, 57.9% correctly defined AI as a contagious disease caused by microorganism that affects all species of birds and 91.4% knew that it can be transmitted from one infected animal to another (Table 1). However, only 10.7% knew that AI could be transmitted by touching uncooked poultry. Over two thirds of workers knew that poultry and wild birds are vectors of the disease. Knowledge of people at risk of contracting AI was generally low with only 17.9% having good or adequate AI knowledge. With respect to identifying measures that help to prevent spread of AI, most workers (60.7%) knew about washing hands with soap and water, but knowledge on the use of glove and face masks was low.

Most knew that AI is a preventable (68.6%) and serious (55.0%) disease. Mean score (scale of 1-10) for perceived risk of contracting AI among workers and their families were 2.6 and 2.5 respectively, indicating low risk perception.

Knowledge was greater in persons with more education and those who believed they were at high risk of contracting AI (Table 2). Respondents who were more likely to believe they were at high risk (18.6%) worked fewer hours and had greater knowledge (Table 2). A total of 28.6% reported they modified their work habits since they knew of AI because of fear of contracting it. Those who modified their habits reported always washing their hands (63.6%), washing/disinfecting surfaces/utensils (20.0%), using gloves (2.9%) and using face mask (0.7%). Those who agreed AI may be preventable and serious were more likely to modify their behavior (Table 2).

Majority of the respondents (45.7%) do not use protective measures or devices because they do not think they are important. The next important barriers were cost (33.6%) and ignorance of the measures (29.3%) while the least common barrier was scarcity of water (8.6%).

No association was found between respondent's age, marital status, number of children or years spent in poultry trade and self perceived risk or with likelihood of modifying their behavior. But these variables were associated with knowledge in univariate analyses; with younger poultry traders, those with fewer children or years spent in poultry trade having greater knowledge while married respondents had less knowledge.

Poultry traders received information on AI through mass media campaigns, posters and other sources following the AI planning and response.

Figure 1

Table 1: Knowledge of avian influenza among 140 poultry traders in Live Poultry Markets (LPM) in Zaria, Nigeria

Variable	Correctly answered, No. (%)
Definition (contagious infection caused by microbes that can affect all species of birds)	81 (57.9)
Modes of transmission	
• Animal to human	• 29 (20.7)
• Animal to animal	• 128 (91.4)
• Human to human	• 124 (88.6)
• Environment to human	• 12 (8.6)
• Eating uncooked poultry	• 29 (20.7)
• Eating cooked poultry	• 136 (97.24)
• Eating uncooked eggs	• 23 (16.4)
• Eating cooked eggs	• 138 (98.6)
• Touching uncooked poultry	• 15 (10.7)
• Touching cooked poultry	• 139 (99.3)
• Touching saliva, nasal secretions, feces and fomites of infected birds	• 39 (27.9)
• Poultry	• 98 (70.0)
• Wild birds	• 93 (66.4)
• Rabbits	• 112 (80.0)
Risk group	
Poultry workers	31 (22.3)
Butchers	18 (12.86)
Veterinarians	16 (11.43)
Use of preventive measures	
Washing hands with soap and water	85 (60.7)
Face mask	39 (27.9)
Gloves	49 (35.0)
Wash and disinfect utensils	81 (57.8)
Wash and disinfect surfaces	80 (57.1)

Figure 2

Table 2. Logistic regression models results of knowledge, attitudes, and practices of AI among 140 poultry traders in Zaria, Nigeria

Variable	OR	95%CI	P value
Model 1: General knowledge of AI and its preventive measures; log likelihood = 47.74, $\chi^2$32.40, df 3, p <0.0001			
Hours spent daily on poultry work	0.93	0.76-1.15	0.507
Educational level	2.16	1.03-4.54	0.042
Number of children of the worker	0.73	0.52-1.02	0.064
High versus low risk perception of AI	5.36	1.70-16.91	0.004
Model 2: Risk perception of AI; log likelihood = 51.06, $\chi^2$32.26, df 3, p <0.0001			
High versus low knowledge score	3.89	1.24-12.17	0.020
Type of poultry trading/work (selling, slaughtering, de-feathering)	0.53	0.27-1.03	0.061
Hours spent daily on poultry trading/work	0.76	0.61-0.95	0.016
Believes AI is a serious disease	0.42	0.21-0.83	0.012
Model 3: Modification of working habits since you know about AI; log likelihood = 72.15, $\chi^2$23.22, df 3, p =0.0001			
Believed AI may be prevented	4.05	1.28-12.81	0.017
Believed AI is a serious disease	3.24	1.29-8.14	0.012
High versus low knowledge score	1.14	0.42-3.14	0.796
High versus low risk perception of AI	1.59	0.59-4.27	0.360

Figure 3

Figure 1. Live Poultry Market (LPM) with slaughtering/de-feathering ongoing beside

Figure 4

Figure 2. Improved building for rendering poultry beside a LPM as part of the AI control project

DISCUSSION

This study found poor knowledge, risk perception and work habit behavior modification practices among poultry traders in Nigeria. Risk perception of contracting AI among poultry traders and their family members was low similar to findings from Hong Kong (5) where only 15% perceived they were likely to get sick from handling poultry. This low risk perception may be attributable to paucity of knowledge and information about the disease with less than a fifth of respondents in this study having adequate knowledge of AI.

Though knowledge of preventive measures was fair, adoption of personal protective devices such as gloves and face masks was found to be low although 59 (42.1%) reported washing hands with soap and water always or often after handling poultry. This is higher than results obtained in the Hong Kong study (5), but significantly lower than that of the Egyptian study where up to 97% of the general public washed their hands with soap and water after handling poultry (6). This implies that the study population is highly at risk of contracting the disease in case of an epidemic.

Using micro-neutralization and modified horse red cell haemagglutination inhibition serologic assays no evidence for avian-to-human transmission of AI was found among 295 poultry workers in Kano, northern Nigeria (7) but studies elsewhere have confirmed direct exposure to infected poultry as the primary risk factor in transmission of AI virus to humans. A study conducted at Vietnam (8) in a rural area with outbreaks of highly pathogenic AI showed a positive relationship between poultry exposure and illness of members of the population. In Hong Kong a study of poultry workers showed that greater exposure to poultry was associated with antibody to H5 hemagglutinin (3).

Women were not studied and the study was conducted in northern Nigeria but it is probable that findings can be generalized to whole country. Thus, improving knowledge of transmission and application of preventive measures will be a useful public health strategy for reducing the effects of AI in poultry traders/workers in Nigeria. Improvements in poultry working conditions and infrastructural upgrades at LPMs are slowly being implemented (Figure 2) but the government should broaden these improvements throughout the country, ensure steady water supply and maintenance of general hygienic standards at the LPMs. Provision of protective equipment at subsidized rates in such high risk places which play a pivotal role in maintaining the AI epidemic should be explored. As these are implemented effective and coordinated information should be provided through mass media, health professionals and supervisory authorities like the Ministries of Agriculture, Health, Information and Labour to these high risk workers.

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References

1. World Health Organisation: Cumulative number of confirmed human cases of avian influenza A (H5N1) reported to WHO. [http://www.who.int/csr/disease/avian_influenza/country/cases_table_2009_06_02/en/index.html].
2. Breiman RF, Nasidi A, Katz MA, Njenga MK, Vertefeuille J. Preparedness for highly pathogenic avian influenza pandemic in Africa. Emerging Infectious Diseases 2007; 13: 1453 – 8.
3. Bridges CB, Lim W, Hu-Primmer J, Fukuda K, Mak KH, et al. Risk of influenza A (H5N1) infection among poultry workers, Hong Kong, 1997-1998. J Infect Dis. 2002; 185: 1005-10
4. Abbate R, Di Giuseppe G, Marinelli P, Angelillo IF. Knowledge, attitudes, and practices of avian influenza, poultry workers, Italy. Emerging Infectious Diseases 2006; 12: 1762 – 5.
5. Kung NY, Morris RS, Perkins NR, Sims LD, Ellis TM, Bisset L, et al. Risk for infection with highly pathogenic influenza A virus (H5N1) in chickens, Hong Kong 2002. Emerging Infectious Diseases 2007; 13: 412 – 8.
6. El-Zanaty F and El-Ghazaly N. Avian influenza survey: knowledge, attitudes and practices of the Egyptian public. [Available from Soul Beat Africa, Institute Health & Development Communication, July 2007 at - http://www.comminit.com/en/node/223876/38]
7. Ortiz JR, Katz MA, Mahmoud MN et al. Lack of evidence of avian-to-human transmission of AI (H5N1) virus among poultry workers, Kano, Nigeria, 2006. West African College of Physicians (WACP). 32nd General & Scientific meeting Abuja, Nigeria [abstract 28], November, 2008.
8. Dinh PN, Long HT, Tien NTK, Hien NT, Mai LQ, Phong LH et al. Risk factors for human infection with AI A H5N1,

Vietnam, 2004. Emerging Infectious Diseases 2006; 12: 1841 – 7.

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