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Epidemiological risk factors of knowledge and preventive practice regarding avian influenza among poultry farmers and live bird traders in Ikorodu, Lagos State

Nusirat Elelu

Department of Veterinary Public Health and Preventive Medicine, University of Ilorin, Kwara State, Nigeria

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ABSTRACT

Avian Influenza (AI) is an infectious disease of birds caused by type A influenza virus. The disease which poses a pandemic risk has led to death or depopulation of millions of birds. This study determined the risk factors that predict adequate knowledge and good preventive practice measures towards AI, among poultry farmers and live bird traders in Ikorodu, Lagos State South-western Nigeria.

A descriptive cross sectional survey was conducted with questionnaire on socio- demographics, knowledge of definition, and transmission of avian influenza administered to 244 respondents at interview. Descriptive, Chi-square and logistic regression analysis were carried out to explore associations between demographic characteristics, knowledge and preventive practice scores. All levels of significance were set at $p < 0.05$.

The total knowledge score computed on a 25-item scale revealed a mean total knowledge of 9.9 (SD ± 6.6). Respondents aged <20 years, live bird traders and those with no formal education had the poorest knowledge. The total preventive practice score regarding avian influenza on a 9-item scale revealed a mean of 5.3 (SD ± 2.1). Younger respondents, live bird traders; those with no tertiary education and those that had spent <24 months in their profession had the poorest preventive practice score. Logistic regression analysis shows that increasing education ($p < 0.05$) significantly predicted adequate knowledge of avian influenza and good preventive practice among respondents.

A sustained biosecurity combined with knowledge of transmission, zoonotic and pandemic risk training will improve prevention and control.

1. Introduction

The emergence of highly pathogenic avian influenza (HPAI), subtype H5N1 has led to increased global attention to the disease as the virus could potentially represent the source of the next human influenza pandemic [1]. Avian Influenza (AI) is an infectious disease of birds caused by type A influenza virus. In poultry, the virus causes distinctly different form of disease – one common and mild, the other rare and highly lethal. The mild form may be expressed only as ruffled feather, reduced egg production or mild effects on the respiratory system. The second and less common highly pathogenic form is characterized by sudden onset of severe disease, rapid contagion invading multiple organ and tissues and a mortality rate that can approach 100% in 48 h. The resulting massive, internal haemorrhage has earned it the lay name "chicken Ebola" [2]. The first outbreak within the poultry population in Africa was reported in Kaduna State, Nigeria, in February 2006 [3]. Since then, the disease has spread within the poultry population in most parts of the continent, which has resulted in the death or depopulation of millions of birds and up to US$5.4million paid in compensation in Nigeria alone [4]. A second outbreak of the disease was also reported in 18 out of 37 states of Nigeria involving both farms and live bird markets (LBM) in January 2015 [4]. In January 2017, the Nigerian Agriculture minister reported the avian influenza virus has invaded the Nigerian poultry in 26 states killing over 3.5 million birds and millions of Naira paid as compensation

Abbreviations: AI, Avian Influenza; AICP, Avian influenza control project; CDA, community development area; FAO, Food and Agriculture Organization of United Nations; H, Haemagglutinin; KAP, knowledge, attitude and practice; LBM, live bird markets; LGA, Local Government Area; N, Neuraminidase; SPSS, Statistical package for social scientists; WHO, World health organization.

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E-mail address: nusyelelu@yahoo.com

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[5]. Also a recent study confirmed that 39.4% of the LBMs surveyed in Africa were infected with the virus [6].

Of all influenza viruses that circulate in birds, the H5N1 virus is of greatest concern for human health for two main reasons. First, the H5N1 virus has crossed the species barrier to infect humans and the second implication for human health of far greater concern is the risk of a pandemic [2]. The first human case of avian influenza was reported in Hong Kong in 1997 [7]. Since then there have been several alarming cases in humans. As of March 20, 2015, the WHO has reported 430 deaths in 16 countries attributable to H5N1, with a case fatality ratio of 55% [8]. In January 2007, there was a confirmed human death from H5N1 in Lagos, Nigeria where there was continuing sporadic outbreak [9].

In the past years a number of studies have been published investigating knowledge, attitudes, and practice (KAP) regarding avian influenza among target groups such as poultry workers and general population [10–12]. This area of investigation seems to be an important one because members of the public often misinterpret their risk of health problems [13]. In addition past studies have demonstrated that live poultry famers are high-risk groups in avian influenza virus transmission and LBMs play an important role in its spread from birds to humans [14,15]. Moreover, LBMs have also been reported in previous studies to serve a central distributive function for the dissemination of the virus [6]. The virus can also persist in LBMs for several weeks [16] and thus these environments are suitable for viral re-assortment [4].

Most people are not knowledgeable about AI and the dangers it's likely to pose, rather they perceive such outbreak as an opportunity for them to eat cheap poultry (being disposed of). In a knowledge, attitude and practice (KAP) study conducted in adult population in Italy, it revealed that only 33.5% of respondents correctly identified the modes of transmission of avian influenza [13]. There is a need to identify the factors that will improve uptake of control strategies by high risk groups. This present study therefore seeks to determine the predictors of knowledge and practice of preventive measures regarding avian influenza among live bird traders and poultry farmers in Ikorodu Local Government Area (LGA) of Lagos State.

2. Materials and methods

2.1. Study location and design

A Descriptive cross sectional survey was conducted in Ikorodu LGA, Lagos State, Nigeria among commercial poultry farmers and live bird traders. Ikorodu LGA (Fig. 1) is one of the administrative divisions of Lagos State. It lays approximately between latitude 6°36′ N and longitude 3°30′ E. Lagos state has a population of approximately 341 poultry farms [17]. Ikorodu local government has one of the largest concentrations these farms and market in Lagos state, was thus selected as the study location. The investigators included the author and two avian influenza desk officers located in Ikorodu LGA who identified the poultry farmers and live bird traders within 3 community development areas (CDA) in Ikorodu LGA. Poultry farmers in Ikorodu North and Imota community development areas; and live bird market in Ikorodu Central were surveyed for this study. (Figs. 2–4) A structured questionnaire modified from a previous KAP study carried out in Italy was used in this survey [11]. The respondents were interviewed confidentially on demographic, knowledge of definition, knowledge of transmission and preventive practices regarding avian influenza. The response choices for all knowledge questions were on a three-point Likert-type scale using "yes", "No", "do not know" whilst those of preventive measures were "always", "often", "sometimes", "rarely" and "never". The questionnaires were back translated to the local language, which is Yoruba. All the poultry workers and live bird traders identified in the area that agreed to participate were recruited into the study. A response rate of 91% (244 respondents) was achieved and was included in the analysis.

2.2. Statistical analyses

Data collected were entered into Microsoft Excel® (Microsoft Redmond, USA) for data cleanup and collation. They were then analyzed using descriptive statistics such as frequencies and percentages on key indicators. To determine the measure of knowledge and preventive practice measures of respondents on AI, a scoring system was used by addition of scores from the variables pertaining to these items. Knowledge regarding avian influenza was scored on a 25-item scale while total preventive practice score was scored on a 9-item scale. A correct response attracted a score of 1, while an incorrect response attracted a score of 0. The mean knowledge and preventive score was computed in which adequate knowledge/good preventive practice was then categorized using the mean as cutoff. Respondents with scores above the mean while inadequate knowledge/poor preventive practice scores were those with scores below the mean. Data were then exported into SPSS software version 16.0 (SPSS Inc., Chicago, IL, USA) to carry out Chi-square tests or Fisher's exact tests in order to explore associations between demographic variables, knowledge scores and preventive practice scores. Variables that were significant from the bivariate analysis was further subjected to logistic regression analysis using forward stepwise method to identify possible predictors of knowledge and preventive practice regarding avian influenza. These predictors from the analysis were compared to past studies from literatures from other parts of the world. All levels of significance were set at $p < 0.05$.

3. Results

3.1. Knowledge score analysis regarding avian influenza

The total knowledge score computed in this study regarding avian influenza on a 25-item scale revealed a mean knowledge score of 9.9 (SD ± 6.6). Respondents with knowledge score above 9.9 were classified as having adequate knowledge while respondents with scores below the mean were classified as having inadequate knowledge. About 60.0% of respondents had adequate total mean knowledge scores. Table 1 below shows the knowledge scores of respondents based in different demographic variables. Greater knowledge was recorded in older respondents, female, poultry farmers and respondents with tertiary education.

Further logistic regression analyses of knowledge score showed that increasing education ($p < 0.05$) was significantly associated with good knowledge score.

3.2. Preventive practice score analysis regarding avian influenza

The total preventive practice score regarding avian influenza on a 9-item scale revealed a mean score of 5.3 (SD ± 2.1). Respondents with total preventive scores above the 5.3 were classified as having good preventive practice regarding avian influenza while respondents below the mean were categorized as having poor practice scores. Sixty-eight percent (68.0%) of all respondents had good practice scores. Table 2 shows the total preventive practice score of respondents based in different groups.

Logistic regression analyses of preventive practice score showed that increasing education ($p < 0.05$) significantly predicted good preventive practice among the respondents.

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