

Full Length Research Paper

Influenza A H1NI (Pandemic 2009): How prepared are healthcare providers in Calabar, Nigeria?

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In April 2009, an outbreak of influenza was reported in Mexico and California and within months, it spread to all continents of the world. An influenza pandemic has always posed a threat to global public health. The objective of this study was to assess the knowledge, attitude, reported practice and preparedness of health care providers in Calabar, Nigeria, regarding the H1N1 pandemic. This was a prospective study. A semi-structured questionnaire was administered on health care providers in Calabar, Nigeria. One hundred and forty-five (41.6%) respondents reported that the infection was transmitted from pigs to humans whereas 53 (15.1%) reported that it was transmitted from humans to humans. Two hundred and thirty-one (66.0%) respondents were not willing to work in a hospital unit where patients with Influenza A H1N1 are treated. One hundred and thirty-eight (39.4%) respondents were willing to receive vaccination against Influenza A H1N1 while majority, 212 (60.6%) were not willing. There are gaps in knowledge of respondents regarding H1N1 infection and their level of preparedness is low. Capacity building in emergency preparedness for infectious disease epidemic is recommended.

Key words: Influenza, H1N1, pandemic, infections, Calabar, Nigeria.

INTRODUCTION

The Black Death of the 14th century killed almost 100 million people worldwide (Suzanne, 2003). Apart from this, no other communicable disease has killed more people than the influenza pandemic of the early 20th century (Suzanne, 2003). There was an outbreak of influenza in 1918 and within 18 months, the disease had spread to all continents of the world, leaving a death toll of over 50 million (Tuabenberger and Morens, 2006). Subsequently, more outbreaks have occurred, including those of 1957 and 1968. All these outbreaks have had catastrophic impact on humanity.

In 2003, there was a crossing of highly pathogenic strains of avian influenza virus, including the H5N1 and H7N7 subtypes, from birds to humans. This resulted in

the death of a veterinarian (Webby and Webster, 2003).

In April 2009, another outbreak of influenza was reported in Mexico and Southern California. Within months, it spread to all continents of the world. By 4th October, 2009, the World Health Organization (WHO) had reported 375, 000 laboratory- confirmed cases of the disease (WHO, 2009). Although the disease is now called Pandemic Influenza H1N1 2009, there was some uncertainty concerning what should be its correct name at the beginning. It was initially called Mexican Flu. Later, when studies showed that the virus contains genes that were similar to those of the viruses that cause influenza among pigs in North America, the name was changed to swine influenza (swine flu). Further studies showed that this virus is actually a new virus that man has not known before. It was also found that it combines two genes from the viruses that cause (the real) swine flu in pigs, with those of viruses that cause bird flu and those of viruses

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that cause human flu. Transmission was found to be from humans to humans and not from pigs to humans as earlier postulated. On the basis of these findings, the WHO advised that the disease should no longer be called "Swine flu" but rather, Influenza A H1N1 (WHO, 2009).

Increasing global travel facilitated by advancement in means of transportation has led to globalization of disease. Nigeria was one of the first West African countries to report laboratory-confirmed cases of the disease (FMOH, 2009). Health care providers play a pivotal role in the control of this disease. Firstly, they are required to provide the necessary care for influenza A H1N1 patients. Secondly, because of the nature of their work, they can easily act as agents of transmission of the disease to other patients as well as their household and social contacts. The objective of this study was to determine how prepared healthcare providers were to handle a possible influenza A H1N1 outbreak in Calabar, Nigeria.

MATERIALS AND METHODS

This study was carried out in Calabar, the capital of Cross River State of Nigeria. Cross River State is a tourist haven, a situation that attracts people from all over the world to the state. Among the tourist attractions of note include the annual (international) Calabar Carnival, the Obudu International Mountain race and the TINAPA business resort. The city hosts Nigeria's Premier Free Zone which attracts workers and clients from all over the world. Calabar has an international airport and a seaport both of which facilitate travel to and from all parts of the world. The city's two universities attract both students and academics from different countries. The best health institutions in the state are located in Calabar; notable among them is the University of Calabar Teaching Hospital which receives referrals from neighboring states as well as Nigeria's eastern neighbors, Cameroun Republic and Equatorial Guinea.

This was a descriptive cross-sectional study. The study was conducted prospectively among healthcare providers in both public and private healthcare facilities in Calabar between August and December, 2010. The sample size for the study was three hundred and fifty. Ethical clearance for this study was obtained from the Research Ethics Committee of the University of Calabar Teaching Hospital, Calabar. The instrument for this study was a semi-structured questionnaire designed using the study objectives. The instrument was used to obtain information regarding respondents' socio-demographic variables, their knowledge regarding influenza A H1N1, source of information about the disease, including its causative agent, mode of transmission, training in emergency preparedness as well as knowledge of primary preventive measures. It also assessed their attitude towards caring for patients with the disease. Each respondent gave verbal informed consent before the administration of the questionnaire.

Data obtained from the study was entered into a computer and analysed using EPI –Info Statistical Software version 3.5.1.

RESULTS

Socio-demographic characteristics

One hundred and seven (30.6%) respondents were aged 20-29 while only 11 (3.1%) were aged 60 and above. The mean age of respondents was 28±3 years.

The majority of the respondents; n=209 (59.7%) were females with 140 (40.0%) males and one (0.3%) respondent did not indicate the sex. Majority of the respondents, 247 (70.5%) were married while 43 (12.2%) were never married. Two hundred and seventy respondents (77.1%) were employed in the public sector with 77 (22.0%) employed in private health institutions. Three hundred and eight (88%) respondents were Christians with 16 (4.6%) Muslims, 6 (1.7%) of the African Traditional Religion and 20 (5.7%) belonged to other categories.

One hundred and thirty-four (38.3%) were medical doctors while 127 (36.3%) were nurses, 7 (2.0%) were pharmacists and 37 (10.5%) were laboratory scientists. One hundred and twenty-seven (36.3%) respondents were of the Ibibio/Annang/Oron extraction with 90 (25.7%) Efiks.

Knowledge regarding Influenza A H1N1

Knowledge regarding influenza A H1N1 is summarized in Table 1. Two hundred and fifteen (61.3%) respondents reported that they obtained information about H1N1 from television and 99 (10.4%) reported that they obtained information from medical journals. Majority of respondents, 182 (52.0%) reported that H1N1 was a viral infection, 79 (22.6%) reported that it was a bacterial infection and 10 (2.8%) reported that it was a fungal infection. One hundred and seventy (48.6%) respondents reported that the names "swine flu and Influenza A H1N1 can be used synonymously with 60 (17.1%) reporting that it was a misnomer to use both names interchangeably.

Only 38 (10.9%) respondents reported that the first country to report Influenza A H1N1 was Mexico with 76 (21.7%) reporting that it was Canada and 72 (20.6%) reporting that it was the United States of America.

One hundred and two (29.1%) respondents reported that vaccines against seasonal flu offer little or no protection against Influenza A H1N1 and 150 (48.9%) reported that children who have been fully immunized against the childhood killer diseases are immune to the virus. Ninety (25.7%) respondents reported that adults who experienced the influenza epidemic of the 1960's have absolute natural immunity against influenza A H1N1.

Fifty (14.3%) respondents reported that Ethiopia was the first African country to report a case of Influenza A H1N1 and 130 (37.0%) reported that the disease was first reported in Nigeria.

Attitude towards Influenza A H1N1

Two hundred and sixty-one (74.6%) respondents reported that they would not be willing to work in a hospital unit where patients with Influenza A H1N1 are treated while only 89 (25.4%) respondents reported willingness to work in such a unit (Tables 2 and 3).

Table 1. knowledge regarding Influenza A H1N1.

| | Frequency | Percent |
|--|-----------|---------|
| What is the cause of swine flu? | | |
| Bacterial infection | 79 | 22.6 |
| Fungal infection | 10 | 2.8 |
| Viral infection | 182 | 52.0 |
| Cause not yet known | 79 | 22.6 |
| Total | 350 | 100.0 |
| Should swine flu and Influenza A H1N1 be used synonymously? | | |
| I do not know if there is a difference between the two names | 120 | 34.3 |
| It is a misnomer | 60 | 17.1 |
| It is appropriate to use both synonymously | 170 | 48.6 |
| Total | 350 | 100.0 |
| How is Influenza A H1N1 transmitted | | |
| From humans to humans | 53 | 15.1 |
| From humans to pigs | 17 | 4.9 |
| From pigs to humans | 145 | 41.6 |
| Through eating infected pork meat | 46 | 13.2 |
| Through drinking water and food that have been contaminated | 11 | 3.1 |
| Mode of transmission has not yet been discovered | 35 | 10 |
| Total | 350 | 100.0 |
| Which country reported the first case of H1N1? | | |
| Argentina | 30 | 8.6 |
| Canada | 76 | 21.7 |
| Mexico | 38 | 10.9 |
| South Africa | 34 | 9.6 |
| United states of America | 72 | 20.6 |
| Don't know | 100 | 28.6 |
| Total | 350 | 100.0 |
| Concerning vaccination against influenza A H1N1 | | |
| Vaccines against seasonal flu offer little or no protection | 102 | 29.1 |
| Children who have been fully immunized against the childhood killer diseases are immune to the virus | 150 | 48.9 |
| Adults who experienced the influenza epidemic of the 1960s have absolute natural immunity against influenza A H1N1 | 90 | 25.7 |
| Non-response | 8 | 2.3 |
| Total | 350 | 100.0 |
| Which country was the first to record a case of influenza A H1N1 in West Africa? | | |
| Egypt | 58 | 16.5 |
| Ethiopia | 50 | 14.3 |
| India | 17 | 4.9 |
| Nigeria | 130 | 37.0 |
| South africa | 95 | 27.3 |
| Total | 350 | 100.0 |

Preparedness to tackle Influenza A H1N1 infection

One hundred and thirty-eight (39.0%) respondents had

ever received training on emergency preparedness for infectious diseases epidemic while 212 (61.0%) had not received such training. Out of the 138 respondents that

Table 2. Preparedness for Influenza A H1N1 epidemic.

| Have you ever received training on emergency preparedness for infectious diseases epidemic? | Frequency | % |
|--|------------------|----------|
| Yes | 138 | 39.0% |
| No | 212 | 61.0% |
| Total | 350 | 100% |

| Did the training include preparedness for influenza A H1N1 infection? | Frequency | % |
|--|------------------|----------|
| Yes | 20 | 5.7% |
| No | 118 | 94.3% |
| Total | 138 | 100% |

Table 3. Attitude towards Influenza A H1N1.

| Would you be willing to work in a unit meant for the treatment of influenza A H1N1 patients only? | Frequency | % |
|--|------------------|----------|
| Yes | 89 | 25.4% |
| No | 261 | 74.6% |
| Total | 350 | 100% |

| Would you be willing to receive vaccination against H1N1? | Frequency | % |
|--|------------------|----------|
| Yes | 138 | 39.4% |
| No | 212 | 60.6% |
| Total | 350 | 100% |

had received training in emergency preparedness for infectious diseases, only 20 (5.7%) reported that the training included preparedness for influenza A H1N1 while for 118 (94.3%), the training did not include preparedness for influenza A H1N1. One hundred and thirty-eight (39.4%) respondents would be willing to receive vaccination against Influenza A H1N1 while majority, 212 (60.6%) would not be willing to receive the vaccination (Table 2).

Association between previous training in emergency preparedness and willingness to work in a unit for treatment of Influenza A H1N1 patients

There was a statistically significant association between previous training in emergency preparedness and willingness to work in a unit for treatment of Influenza A H1N1 patients ($P = 0.0000$) (Table 4).

Association between previous training in emergency preparedness and willingness to receive vaccination against Influenza A H1N1

There was a statistically significant association between previous training in emergency preparedness and willingness to receive vaccination against Influenza A

H1N1 ($P = 0.0000$) (Table 5).

Association between professional group and knowledge of the causative agent of Influenza A H1N1

There was a statistically significant association between professional group and knowledge of the causative agent of Influenza A H1N1 ($P=0.0000$) (Table 5).

Association between professional group and willingness to receive vaccination against Influenza A H1N1

There was a statistically significant association between professional group and willingness to receive vaccination against Influenza A H1N1 ($P=0.0000$).

Association between previous training including Influenza A H1N1 and willingness to work in a unit for Influenza A H1N1 patients

There was a statistically significant association between previous training including Influenza A H1N1 and willingness to work in a unit for treatment of Influenza A H1N1 patients ($P=0.0020$).

Table 4. Source of information regarding Influenza A H1N1.

| Source of information about H1N1 | Frequency* | Percent |
|-------------------------------------|------------|---------|
| Radio | 202 | 21.4 |
| Television | 215 | 22.8 |
| Newspapers | 164 | 17.4 |
| Healthcare providers and colleagues | 165 | 17.5 |
| Medical Journals | 99 | 10.4 |
| Internet | 100 | 10.5 |
| Total | 945 | 100 |

*Multiple responses allowed.

Table 5. Association between some variables.

| Previous training in emergency preparedness | Willingness to work in unit for H1N1 patients | | Total | |
|---|---|-----------------|-------|--|
| | Yes | No | | |
| Yes | 67 | 71 | 138 | chi square = 64.24 p = 0.0000 |
| No | 22 | 190 | 212 | |
| Total | 89 | 261 | 350 | |
| Previous training in emergency preparedness | Willingness to receive vaccination against H1N1 | | Total | |
| | Yes | No | | |
| Yes | 85 | 53 | 138 | chi-square = 71.71, df = 3 p = 0.0000 |
| No | 37 | 175 | 212 | |
| Total | 122 | 228 | 350 | |
| Professional group | Knowledge of the causative agent of h1n1 | | Total | |
| | Correct knowledge | Wrong knowledge | | |
| Medical doctor | 110 | 24 | 134 | chi -square 76.84, df=5,p=0.0000 |
| Pharmacist | 5 | 2 | 7 | |
| Nurse | 81 | 46 | 127 | |
| Laboratory scientist/technician | 20 | 17 | 37 | |
| Ward orderly/assistant | 5 | 18 | 23 | |
| Other | 0 | 22 | 22 | |
| Total | 221 | 129 | 350 | |

Association between previous training including influenza a H1N1 and willingness to receive Influenza A H1N1 vaccination

There was no statistically significant association between previous training including Influenza A H1N1 and willingness to receive Influenza A H1N1 vaccination; (Fischer's Exact =0.738).

DISCUSSION

Health care providers play a pivotal role in the control of any infectious disease. Firstly, they are required to provide the necessary care for patients. Secondly, because of the nature of their work, they can easily act as agents of transmission of the disease to other patients as well as their household and social contacts.

Majority of respondents obtained information about H1N1 from television while the least obtained it from medical journals. This finding is in contrast to that of Fatiregun et al. (2011) in Osogbo, South-Western Nigeria, where it was found that 73.6% of health care providers obtained information about the disease from newspapers. That very few respondents obtained information about the disease from medical journals may be due to the paucity of information about it in such journals, since few studies have been done on it. It may also be due to non-availability of current journals as the lean financial resources of Nigerian health care providers may not be enough for them to meet their basic existential needs with left over for the purchase of journals. The number of respondents who knew that H1N1 was a viral infection in this study was surprisingly low since the word "influenza" has been a common word among health care providers and the general populace

for a long time now.

Almost half of the respondents felt that the infection is transmitted from pigs to human while very few knew that it was transmitted from person to person. This was in contrast to the findings of Aslan et al. (2010) in Turkey, which reported that 65% of health care workers knew that the infection was transmitted from person to person. Similarly, Fatiregun et al. (2011) in Ibadan also found that 51.6% of health care providers knew that the infection was transmitted from one person to another. This problem could be associated with the fact that in the early days of the outbreak of the infection, it was erroneously called "swine flu".

The state of preparedness of the health care providers to handle H1N1 as indicated by the number who would be willing to work in a hospital unit where H1N1 patients are being treated may be attributed to lack of training in emergency preparedness. Even for the few providers that had received training in emergency preparedness, most of such training did not contain preparedness for H1N1 pandemic. This may also explain why majority of the respondents would not be willing to receive vaccination against H1N1. More so, the health care providers may be afraid of the possibility of having vaccine induced disease. In a study among health care workers in Turkey, Savas and Tanriverdi (2010) reported that the vaccination rate was low. Chore et al. (2009) had earlier reported low acceptance rate of 47.9% in Hong Kong. In Mexico, Esteves-Jaramillo et al. (2009) found that 80% of health care providers were willing to receive Influenza H1N1 vaccine while Kaboli et al. (2010) reported 69% acceptance rate among health care providers in British Columbia. FitzGerald et al. (2009) found that only 26% of emergency department staff in Australia reported being vaccinated against Influenza A H1N1. A statistically significant association was found between previous training in emergency preparedness and willingness to work in a unit for treatment of Influenza A H1N1 patients ($P = 0.0000$). Similarly, there was a statistically significant association between previous training in emergency preparedness and willingness to receive vaccination against Influenza A H1N1 ($P = 0.0000$). These findings could suggest that health care providers who received such training may have obtained the right type of information about H1N1 which is in contrast to the wrong information others may have obtained about the infection from some other (wrong) sources. Such wrong information may negatively affect their perception and attitude regarding the disease.

That there was a statistically significant association between professional group and willingness to receive vaccination against Influenza A H1N1 could suggest that medical doctors, nurses and laboratory scientists may be more willing to receive vaccination than ward orderlies and other categories of staff. This could be because doctors, nurses and laboratory scientists and technicians often carry out procedures on patients that may involve

direct contact with patient's blood. Such procedures may include venectomy and surgical procedures. Ward orderlies and other categories of staff who do not undertake such procedures may underestimate their risk and this false sense of low risk may be responsible for their not being eager to be vaccinated against H1N1.

Conclusion and recommendations

There are gaps in knowledge of respondents concerning H1N1 infection and their level of preparedness is low. Their attitude towards caring for patients with Influenza A H1N1 is also poor. Capacity building in emergency preparedness for infectious diseases epidemic is recommended.

REFERENCES

- Aslan S, Gulsun S, Citak EC, Oncul A, Pirinccioglu H (2010). An inquiry of knowledge, attitudes and practices against pandemic H1N1 influenza among Turkish health care workers: Experience of a single center in Southeast of Turkey *Journal of infection in developing countries*, 4(10):636-644.
- Chor JS, Ngai KL, Goggins WB (2009). Willingness of Hong Kong healthcare workers to accept pre-pandemic influenza vaccination at different WHO alert levels: two questionnaire surveys. *BMJ*; 25:339.
- Esteves-Jaramillo A, Omer SB, Gonzalez-Diaz E, Salmon DA, Hixson B, Navarro F, Kawa-Karasik S, Paula Frew P, Morfin-Otero R, Noriega ER, Ramirez Y, Rosas A, Acosta A, Badillo VV, Del Rio C (2009). Acceptance of a Vaccine Against Novel Influenza A (H1N1) Virus Among Health Care Workers in Two Major Cities in Mexico. ; 40(8): 705-711.
- Fatiregun AA, Olowookere SA, Oyebade AO (2011). Pandemic Influenza A (H1N1): knowledge among senior health workers at a secondary health care institution in Southwest, Nigeria. *African Health Sciences* (11)2.
- FitzGerald GJ (2011). Pandemic (H1N1) 2009 Influenza Outbreak in Australia: Impact on Emergency Departments. http://eprints.qut.edu.au/38003/1/H1N1_Monograph.pdf, Accessed December 4.
- Kaboli F, Astrakianakis G, Li G, Guzman J, Donovan T, Naus M (2010). Influenza vaccination and intention to receive the pandemic H1N1 influenza vaccine among healthcare workers of British Columbia, Canada: a cross-sectional study. *Infect Control Hosp Epidemiol.*; 31(10):1017-24.
- Savas E, Tanriverdi (2010). Knowledge, attitudes and anxiety towards influenza A/H1N1 vaccination of healthcare workers in Turkey *D BMC Infectious Diseases*, 10:281.
- Suzanne A A (2003). *A pest in the land: new world epidemics in a global perspective*. University of New Mexico Press.. ISBN 0826328717. pp. 21
- Tuabenger JK, Morens DM (2006). 1918 Influenza: The mother of all pandemics. *Emerg Infect Dis.* 12(1):15-22.
- Webby RJ, Webster RG (2003). Are We Ready for Pandemic Influenza? *Science* 302:1519-28
- WHO (2009). Situation updates: Pandemic (H1N1) 2009. http://www.who.int/csr/don/2009_10_09/en/index.html . Accessed on August 23, 2009.
- WHO/AFRO (2009). What the general public must know about Pandemic Influenza H1N1 2009. http://www.afro.who.int/ddc/influenzaa/guidelines/mes_public_eng.pdf . Accessed on October 1, 2009.