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Influenza vaccine acceptance among pregnant women in urban slum areas, Karachi, Pakistan

Afshin Alaf Khan[a], Aiden Kennedy Varan[a], Alejandra Esteves-Jaramillo[b], Mariam Siddiqui[a], Shazia Sultana[c], Asad S. Ali[c], Anita K.M. Zaidi[c], Saad B. Omer[a,d,e,*]

[a] Rollins School of Public Health, Emory University, 1518 Clifton Road NE, Atlanta, GA 30322, USA
[b] National Center for Child and Adolescent Health, Ministry of Health, Francisco de P. Miranda 177, Lomas de Plateros, Álvaro Obregón, 01600 Mexico City, Mexico
[c] Department of Pediatrics and Child Health, The Aga Khan University, Karachi 74800, Pakistan
[d] Emory Vaccine Center, 201 Dowman Drive, Atlanta, GA 30322, USA
[e] Emory University School of Medicine, 1648 Pierce Drive NE, Atlanta, GA 30322, USA

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ABSTRACT

Background: Facilitators and barriers to influenza vaccination among pregnant women in the developing world are poorly understood, particularly in South Asia. We assessed intention to accept influenza vaccine among ethnically diverse low-income pregnant women in Pakistan.
Methods: From May to August 2013, we conducted a cross-sectional survey of pregnant women who visited health centers in urban slums in Karachi city. We assessed intention to accept influenza vaccine against socio-demographic factors, vaccination history, vaccine recommendation sources, and other factors.
Results: In an unvaccinated study population of 283 respondents, 87% were willing to accept the vaccine, if offered. All except two participants were aware of symptoms typically associated with influenza. Perceived vaccine safety, efficacy, and disease susceptibility were significantly associated with intention to accept influenza vaccine ($p < 0.05$). Regardless of intention to accept influenza vaccine, 96% rated healthcare providers as highly reliable source of vaccine information. While a recommendation from a physician was critical for influenza vaccine acceptance, parents-in-law and husbands were often considered the primary decision-makers for pregnant women seeking healthcare including vaccination.
Conclusions: Maternal influenza vaccination initiatives in South Asia should strongly consider counseling of key familial decision-makers and inclusion of healthcare providers to help implement new vaccination programs.

1. Introduction

Pregnant women are at high risk of severe complications and death resulting from influenza [1]. Children under 6 months old are also vulnerable, bearing the highest rate of influenza-related hospitalizations [2]. Pakistan is the sixth most populous country in the world, with a large birth cohort. According to the latest population survey, 14% of Pakistani population is less than 5 years old [3]. Reports on influenza-related morbidity and mortality in Pakistan are limited [4]. However, lower respiratory tract infections are known to be the second largest cause of mortality in the country. Globally, Pakistan ranks third in terms of the number of acute respiratory infections among children under 5 years old (9.8 million cases in 2008) [5].

Vaccination is one of the most effective measures to prevent influenza-related morbidity and mortality in both pregnant women and infants [6]. Currently, no influenza vaccine has been licensed for use in children under 6 months old. However, pregnant women in any trimester have been deemed the highest priority group for influenza vaccination by the WHO's Strategic Advisory Group of Experts on Immunization (SAGE) [7]. In the United States, the Advisory Committee on Immunization Practices (ACIP) and the American College of Obstetricians and Gynecologists recommend annual vaccination for pregnant women [8]. Current evidence

* Corresponding author at: Emory University, Rollins School of Public Health and School of Medicine, Hubert Department of Global Health, 1518 Clifton Rd, Rm 7017, Atlanta, GA 30322, USA. Tel.: +1 404 727 9814; fax: +1 404 727 4590.
E-mail address: somer@emory.edu (S.B. Omer).

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suggests that influenza vaccine not only reduces risk of severe morbidity in pregnant women, but also offers secondary protection to infants for at least the first 6 months of their lives [9].

At present, Pakistan does not include vaccines against influenza in its Expanded Program on Immunization (EPI) schedule for pregnant women and children. The only vaccine currently recommended by EPI for pregnant women is tetanus. Despite being available free of charge, only about 59% of pregnant women in Pakistan have received one or more tetanus vaccinations during gestation in 2012–2013 [3]. There is a pending need to understand the factors underlying low rates of vaccine uptake, and evaluate various facilitators and barriers to maternal influenza vaccination in Pakistan. We were unable to identify any prior study investigating influenza vaccine acceptance rates among pregnant women in South Asia. Our study aimed to assess the factors underpinning the acceptance or rejection of the influenza vaccine by pregnant women seeking care at local health centers in Karachi city. Our findings may provide critical guidance for the implementation of future vaccine programs in Pakistan.

2. Methods

2.1. Study location

Three health centers were selected to participate in our study, all of which were located in Korangi Industrial Area of Karachi, Pakistan. Each health center invited to participate served as the primary healthcare support center in its respective sub-locality of Korangi Industrial Area (Bilal Colony, Ibrahim Haideri, and Ali Akbar Shah). These health centers serve low-income urban populations, including a significant number of migrants from other regions of Pakistan and Bangladesh pursuing employment opportunities. Two of these ethnic groups (Bengali and Pashtun migrants) are known to have the lowest DTP3 (Diphtheria–tetanus–pertussis) vaccination coverage among all ethnic groups of Pakistan (48% and 67%, respectively) [10]. During the period of 2011–2013, routine antenatal care (ANC) was sought by approximately 70% women living in the catchment area; of these women, around 55% sought ANC prior to the third trimester. About 70% of women who had an antenatal care visit had at least 3 antenatal care visits.

2.2. Study design

We conducted a cross-sectional observational study using a 51-item questionnaire to assess the knowledge and practices of pregnant women regarding influenza vaccine. Subjects were enrolled in the study from May to August 2013. Any woman between 18 and 49 years old inclusive, attending a participating health clinic and in any trimester of pregnancy, was eligible for inclusion in the study. Women presented at participating health clinics for routine antenatal care or with symptoms of weakness, low grade fever, sore throat, cough, burning micturition, etc. If pregnant women required hospital care, they were referred to tertiary care hospitals for further consultation and were not approached to participate in the study. Trained members of the study team, unaffiliated with the health staff, approached subjects and provided adequate details of study objectives, methods, associated risks, and potential benefits. Once verbal consent was obtained, each participant's name and signature was recorded on the consent form. If a woman was unable to read and write, a hospital staff member unaffiliated with the study explained the consent form and helped record the subject's thumbprint as proof of consent. Since a majority of study participants were unable to read or write, questions were read aloud by study staff and responses were recorded on printed versions of the questionnaire.

2.3. Outcome measures

The primary outcome of interest was whether a pregnant woman would accept vaccination against influenza if offered to her during pregnancy. Demographic information obtained included age, education, marital status, employment status, self-described ethnicity, ownership of house to assess gradation in socioeconomic status, total number of pregnancies, number of children, and whether any children had previously died of any illness.

We asked participants if they had been advised to receive vaccines during the current pregnancy, the source of such recommendation, and if the vaccines were received. Regardless of vaccination status, we inquired if they intended to get vaccinated against any disease in the current pregnancy. Additionally, pregnant women were asked to rate the reliability of information about vaccines from sources including healthcare staff members, religious leaders, friends or relatives, media, Ministry of Health, and vaccine producing companies. We asked participants to identify any family members who are involved in decision-making about seeking healthcare for their family. Questions were also asked pertaining to the participant's vaccination history, especially during childhood, previous pregnancies, including any post-vaccination complications or hospitalizations.

To assess participants' knowledge and perceptions, we asked whether she could identify symptoms commonly associated with influenza, if she thought pregnant women should be vaccinated against influenza, and if she herself would get vaccinated against the disease if allowed by her family members. The questionnaire also assessed health belief model dimensions, including whether a non-vaccinated and a vaccinated pregnant woman would be susceptible to contracting influenza, if the participant would consider it safe to receive the influenza vaccine, if she thought it was likely for an infant to contract influenza, and whether an infant of a vaccinated mother would be protected against influenza. Lastly, an optional question was asked to identify any and all reasons why pregnant women would accept or reject an influenza vaccine during pregnancy.

2.4. Statistical analyses

SAS 9.3 (SAS Institute Inc., Cary, NC) was used for all data analysis. Figures were produced using Microsoft Excel 2011. 'Don't know' responses were recoded as 'No' responses. Age (based on median), education, employment status, and socioeconomic status were dichotomized. Number of children was categorized into one, two, three, or more than three children.

Univariate statistics were calculated for all study variables. Bivariate analysis was used to identify correlations between socio-behavioral or demographic variables and vaccine acceptance. Univariate logistic regression modeling was used to examine unadjusted associations between each study variable and intention to accept influenza vaccine. Two sided $p < 0.05$ was considered statistically significant.

2.5. Ethical consideration & financial disclosures

The Institutional Review Board at Emory University and the Ethical Review Committee at The Aga Khan University in Karachi reviewed and approved our research study. The researchers declare no conflict of interest in the study. None of the participants received any financial or other incentives.