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ORIGINAL RESEARCH – QUANTITATIVE

Trends in seasonal influenza vaccine uptake during pregnancy in Western Australia: Implications for midwives

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ABSTRACT

Background: Antenatal influenza vaccination is an important public health intervention for preventing serious illness in mothers and newborns, yet uptake remains low.

Aim: To evaluate trends in seasonal influenza vaccine coverage and identify determinants for vaccination among pregnant women in Western Australia.

Methods: We conducted an annual telephone survey in a random sample of post-partum women who delivered a baby in Western Australia between 2012 and 2014. Women were asked whether influenza vaccination was recommended and/or received during their most recent pregnancy; women were also asked why or why they were not immunised.

Findings: Between 2012 and 2014, influenza vaccine coverage increased from 22.9% to 41.4%. Women who reported receiving the majority of their antenatal care from a private obstetrician were significantly more likely to have influenza vaccination recommended to them than those receiving the majority of their care from a public antenatal hospital or general practitioner ($p < 0.001$). In 2014, the most common reason women reported for accepting influenza vaccination was to protect the baby (92.8%) and the most common reason for being unimmunised was lack of a healthcare provider recommendation (48.5%).

Discussion: Antenatal influenza vaccination uptake is increasing, but coverage remains below 50%. A recommendation from the principal care provider is an important predictor of maternal influenza vaccination.

Conclusion: Antenatal care providers, including midwives, have a key role in providing appropriate information and evidence-based recommendations to pregnant women to ensure they are making informed decisions. Consistent recommendations from antenatal care providers are critical to improving influenza vaccine coverage in pregnant women.

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Summary of Relevance:

Problem

- Influenza vaccination during pregnancy prevents serious morbidity in mothers and their infants; however, uptake has been suboptimal historically.

What is Already Known

- Previous studies have shown that 60% of pregnant women are recommended to receive seasonal influenza vaccine during their pregnancy, and as a result, one in three pregnant women receives an influenza vaccine each year.

What this Paper Adds

- Uptake improved between 2012 and 2014. Advice from an antenatal care provider was the most important motivator for

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influenza vaccination in pregnant women, yet 40% of pregnant women were not recommended an influenza vaccine. These results imply there is a greater role for antenatal care providers, including midwives, in encouraging antenatal vaccination and promoting the health of pregnant women and their newborns.

Introduction

Antenatal influenza vaccination has been demonstrated to reduce morbidity in both mothers and their infants.^{1–3} Infection with seasonal influenza during pregnancy is associated with severe illness and increased risk of hospitalisation and adverse infant outcomes, including small for gestational age and low birth weight births.^{4,5} Influenza vaccination during pregnancy has been shown to reduce the risk of these poor neonatal health outcomes.^{6,7} Despite the known benefits of maternal influenza vaccination, historically, fewer than 50% of pregnant women in Australia receive an influenza vaccine each year.^{8–10}

Previous research has found that a recommendation by an antenatal care provider is the primary reason pregnant women get vaccinated against influenza, and lack of discussion with a provider remains a commonly cited reason for non-vaccination.^{11–13} Protecting the infant from infection, perceiving influenza as a serious illness, and believing that the vaccine is safe and effective have also been identified as strong predictors of influenza vaccination during pregnancy.^{14–16} Concerns about the safety of the vaccine for the developing foetus and potential side effects are other commonly cited reasons for non-vaccination among pregnant women.^{8,11,15,16} Because information on maternal influenza vaccination has generally been unavailable in Western Australia, the Western Australia Department of Health (WA Health) has conducted an annual survey in Western Australia since 2012.

It was the goal of this study to use annual survey data to assess trends in uptake of trivalent influenza vaccine (TIV) in pregnant women between 2012 and 2014, as well as factors associated with vaccination and non-vaccination.

Methods

Between 2012 and 2014, WA Health conducted an annual survey of mothers who had recently given birth to a live infant in Western Australia.^{8,14} A random sample of live births was selected in November each year using the Western Australian Midwives Notification System, which is a legally mandated state-wide data collection of attended births in Western Australia.¹⁷ The sample was randomly selected from all births using a random number generator. Sample size was determined based on the number of participants required to measure vaccine uptake with a precision of $\pm 1.5\%$. In 2012, mothers residing in non-metropolitan areas were oversampled. In 2013, mothers from two metropolitan health services were oversampled; these oversampling techniques were not repeated in 2014. Selected women were invited to participate in a 10 min telephone interview; women who declined the invitation were removed from the sample. The remaining women were telephoned by trained interviewers in December to March of each year.

The interview included questions regarding whether the woman was advised by a healthcare provider (HCP) to be immunised against influenza, whether she had received TIV during her most recent pregnancy, and factors associated with

vaccination status. The survey instrument is based on the Pregnancy Risk Assessment Monitoring Systems survey, which is a validated state-based telephone survey of pregnant women conducted by the United States Centers for Disease Control and Prevention.¹⁸ This study was reviewed and approved by the Western Australia Department of Health Human Research Ethics Committee (Project 2014/67).

Data collection

Women were asked to self-report whether they were immunised against influenza during their most recent pregnancy. Where possible, immunisation providers were contacted to verify the self-reported vaccination status. Women were considered “vaccinated” if they self-reported a vaccination which was verified by their immunisation provider. For women who self-reported immunisations administered by a provider without immunisation records (i.e. private workplace, pharmacy), it was assumed the woman was “vaccinated.” Women who self-reported not being vaccinated and those who self-reported being vaccinated but their nominated provider indicated no such vaccination was given were considered “unvaccinated.”

Vaccinated women were asked why they chose to be vaccinated, and unvaccinated women were asked why they were not vaccinated; reasons not listed on the survey were recorded verbatim and coded into themes.

Demographic information was collected during the survey, including the woman's age, postcode of residence, highest level of education completed, presence of chronic medical conditions, and the primary antenatal care provider for her most recent pregnancy (e.g., private obstetrician, general practitioner, public antenatal hospital clinic, private practice midwife, or other). The postcode of residence provided was used to determine whether the woman lived in a metropolitan or non-metropolitan area as well as the socioeconomic status of the woman, as determined by the Socio-Economic Indexes for Areas (SEIFA) score.¹⁹ Women were assigned into tertiles of socioeconomic status based on these scores.

Data analysis

To account for the oversampling strategies implemented in 2012 and 2013, annual survey results were weighted according to the known distribution of births in the state. The odds of receiving a recommendation for influenza vaccination and the odds of receiving an influenza vaccine during pregnancy were examined by age group, health status, educational attainment, socioeconomic status, area of residence and antenatal care provider using multivariate logistic regression analyses which controlled for each of the other variables. Multivariable logistic regression models were used to estimate influenza vaccination status by year, adjusting for area of residence, socioeconomic status, and educational attainment. Complete-case analyses were performed in SAS version 9.4 (SAS Institute Inc., Cary, NC, USA).

Results

A total of 2828 women (2012: $n = 566$; 2013: $n = 1114$; 2014: $n = 1148$) were telephoned, of whom 2018 (71.3%) completed the interview (2012: $n = 416$; 2013: $n = 831$; 2014: $n = 771$). Of the 814 women who did not complete an interview, 43.0% could not be contacted after 10 attempts, 41.5% had incorrect or disconnected telephone numbers, 7.2% declined participation, 6.8% were non-English speaking, and 1.5% were unavailable at the time of interview. One-half of respondents were between 30 and 45 years of age (53.6%), and two-thirds of respondents had post-secondary school qualifications (67.8%); 40.8% were in the

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