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Patient attitudes and experiences to influenza vaccination during pregnancy in South West Victoria during 2019-2020

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Abstract
Objective: To evaluate the experience and attitudes of pregnant women towards influenza vaccination during pregnancy in South West Healthcare, Victoria, including acceptability, uptake and perceived risk, in order to identify the determinants to improve the influenza vaccination rate.
Methods: Self-reported cross-sectional survey conducted at South West Healthcare antenatal clinic, Warrnambool, Victoria. Pregnant women attending the South West Healthcare antenatal clinic during October 2019 to January 2020. Self-reported influenza vaccination rate prior to and during pregnancy, recommendations for vaccination and patient attitudes to the influenza vaccine.
Results: Of the 119 women who agreed to participate in the study, 113 completed the questionnaire (95%). The rate of antenatal vaccination during their current pregnancy was 55%. 68% of those who had not received the vaccine during pregnancy expressed willingness to be immunised. Women were 3.15 times (95% CI 1.3 – 7.3, p=0.007) more likely to receive the influenza vaccination antenatally if they had a recommendation from a healthcare professional (GP, obstetrician, midwife or pharmacist) or from the workplace.
Conclusions: Recommendation for the influenza vaccination during pregnancy by a variety of healthcare professionals is significantly associated with improved immunisation rates amongst pregnant women. Improved patient-centred education on the immuno-protective benefits and severe complications of infection for both mother and her newborn are required to improve antenatal vaccination rates.

Keywords: Influenza, antenatal, pregnancy, vaccination

Introduction
Influenza is a common illness with approximately 5-10% prevalence in the adult population [19]. Pregnant women and their newborns have been recognised by the World Health Organization (WHO) as high-risk populations for severe influenza infection and significant complications [1]. Influenza is more likely to cause severe illness in the pregnancy and postpartum women than in women who are not pregnant due to the physiological changes in the body and immune system [1]. Severe maternal and fetal complications can result from antenatal influenza infection, with the greatest risk of adverse outcome from influenza for pregnant women is the third trimester [1]. Under the Australian National Immunisation Program, the influenza vaccine is currently recommended for every woman during each pregnancy at any gestational age [2].
Antenatal influenza vaccination confers both maternal and neonatal protection, vital during the vulnerable first 6 months of neonatal life during which vaccination cannot be given [3, 4]. Literature has shown influenza vaccination during pregnancy reduces 63% influenza cases and 29% episodes of influenza-like febrile illnesses in both mothers and their infants [5, 6]. It has been shown to reduce and hospitalisation rates by 40-50% during pregnancy [7, 19], and significantly decreases pre-term birth, fetal growth restriction and neonatal and maternal death [7]. However, despite the widely recognised safety of antenatal vaccination [3, 4], immunisation during pregnancy remained a key concern for pregnant mothers as in the 2017 Australian FluMum study [8].
Antenatal influenza vaccination rates have remained substantially low over the past decade [8, 9]. Past Australian estimates of seasonal influenza vaccine uptake during pregnancy have been between 27% to 34% [8, 9]. Better Safe Care Victoria reported the 2017 Victorian average for antenatal influenza vaccine uptake as 53.7%, with South West Healthcare, Warrnambool, reporting uptake as low as 33.8% [10]. The aim of this study is to evaluate the experience and attitudes of pregnant women towards influenza vaccination during pregnancy in South West Healthcare, Victoria, including acceptability, uptake and perceived risk, in order to identify the determinants to improve the influenza vaccination rate.

Materials and Methods

Survey development

A 17-item self-administered questionnaire was designed by the researchers, focussing on themes of vaccination uptake, recommendations for vaccination, patients' thoughts around vaccine safety, model of obstetric care, and demographic characteristics. The survey was delivered to women who attended the South West Healthcare Antenatal clinic, Warrnambool, a level 4 maternity centre. The questionnaire was written and delivered in English.

Participant recruitment

All patients attending the South West Healthcare antenatal clinic were offered to participate in the study. Annually, 640 women attend South West Healthcare antenatal clinic [10]. To achieve a confidence level of 95% and a margin of error of 8.5%, a target sample size of 111 patients was calculated. A total of 119 patients were recruited in this study during a 3-month period between October 2019 and January 2020. 6 patients (5%) did not complete the survey and were removed from the final analyses.

Statistical analysis

Statistical analysis was performed using Prism version 8.3.1. To test for associations, we used X^2 tests and odds ratios. Student's t test and Kruskal-Wallis test were used for P-value calculations for parametric and non-parametric data, respectively. Alpha was set at 0.05.

Results

Patient demographics

The survey response rate was 95% (113/119). The mean age of the women was 29.4 years, (SD 5.31, range 17-47). The mean gestational age was 25.8 weeks (median 28, SD 9.14) and 50% of the women were primigravid at the time of survey completion. Approximately 50% women were in the third trimester during completion of the questionnaire. Table 1 displays the distribution of the women across trimesters of pregnancy in the study.

Table 1: Proportion of women in various trimesters of pregnancy

Gestational age		
Trimester 1 (1 – 12 + 6)	12	10.6%
Trimester 2 (13 – 27 + 6)	44	38.9%
Trimester 3 (28 - birth)	57	50.4%

Overall, 13.2% of the women who participated were surveyed at their initial antenatal visit (15/113), 31.0% (35/113) had received between 1 to 3 appointments prior to survey completion and 55.7% (63/113) had received >4 appointments prior to survey completion.

The median distance from the clinic was 10 km, with a range of 1 to 244 Km. 91.2% of the women were born in Australia, with 1 woman identifying as Aboriginal or Torres Strait Islander. 24% of the women (28/113) reported worked in a healthcare setting. 90% of the women have completed at least year 11 or 12. The educational attainments of the women are displayed in table 2.

Table 2: Educational attainment of the women

Educational attainment		
Year 10 equivalent	11	9.7%
Year 11 or 12	27	23.8%
Certificate III or IV	11	9.7%
Diploma	21	18.5%
Undergraduate (Bachelor)	33	29.2%
Postgraduate (Masters)	10	8.8%
Total	113	

Vaccination uptake

The overall influenza vaccination rate reported was 87%, including women who either received their vaccination during the pre-pregnancy or antenatal period (99/113, 95% CI 80% - 92%). Of the 113 women, 69% (79/113, 95% CI 60% - 77%) were vaccinated prior to pregnancy. 55% (63/113, 95% CI 46% - 64%) received the influenza vaccine during their current pregnancy, and this includes 38% (43/113) women who already had been vaccinated pre-pregnancy. Of the 50 women who had not been vaccinated for influenza in their current pregnancy, 68% (34/50, 95% CI 54% - 79%) stated they were willing to be immunised.

Overall, the most common recommendation for the influenza vaccination was from general practitioners (GP). 33% (38/113, 95% CI 25% - 42%), 24% (28/113, 95% CI 17% - 33%) and 26% (30/113, 95% CI 19-35%) of the vaccinated women received recommendations from their GP, obstetrician and midwife respectively. 27% women received recommendation from the workplace (27/113, 95% CI 16% - 32%). Of these 27 women, 44% worked in healthcare and 22% worked with children. Table 3 outlines the proportion of recommendations received from healthcare providers or the workplace.

Table 3: Number and proportion of recommendations for antenatal influenza vaccination

Recommendation	Number of recommendations	Proportion of women who received recommendation (95% CI)
General Practitioner (GP)	38	33% (25% - 42%)
Obstetrician	28	24% (17% - 33%)
Midwife	30	26% (19% - 35%)
Workplace	27	27% (16% - 32%)
Pharmacist	2	1.7% (0.4% - 6%)
Other:		
IVF Clinic	1	0.8% (0.1% - 4%)
Relative or friend	1	0.8% (0.1% - 4%)

Associations

Women who had received a recommendation for influenza vaccination from any healthcare provider (GP, obstetrician, midwife, pharmacist) or workplace were over 3 times more likely to receive the vaccination during pregnancy (OR 3.15, 95% CI 1.3 – 7.3, p=0.007). Women who received a recommendation from a doctor (GP or obstetrician) for the antenatal influenza vaccination were 2.7 times more likely to be immunised during pregnancy (95% CI 1.28 – 5.59, p=0.01).

Over half the women (51%) in the study were receiving shared antenatal care with both an obstetrician and a GP. However, there was no association found between receiving shared antenatal care and a higher likelihood of receiving a recommendation from a GP (χ^2=0.59, p=0.54) or an obstetrician (χ^2=1.47, p=0.13). Of the women receiving shared care, only 31% (18/58, 95% CI 20% - 43%) recalled receiving a

recommendation from their GP for the influenza vaccination during their current pregnancy. Subsequently, there was no association found between receiving shared care and increased influenza vaccination uptake (χ^2=1.76, p=0.07).

Of the 56 multi-gravid women, 34 (60%) women stated previously receiving the influenza vaccination during a prior pregnancy. However, there was no association found between prior antenatal influenza immunisation and current antenatal vaccination uptake (χ^2=0.11, p=0.73).

Patient attitudes

Of the 113 women, 70% women reported they were aware that the influenza vaccination is recommended during pregnancy (92/113, 95% CI 61% - 77%). Furthermore, 52% stated they believed the vaccine is safe during pregnancy (69/113, 95% CI 44% - 61%).Regarding vaccination availability at the antenatal clinic, 23% (31/113, 95% CI 17% - 31%) and 15% (20/113, 95% CI 10% - 22%) stated that receiving the vaccination at the clinic saves time and money, respectively. Of the 50 women who had not been vaccinated for influenza in their current pregnancy, 68% (34/50, 95% CI 54% - 79%) stated they were willing to be immunised. The main reasons stated by the women for not receiving the vaccination antenatally were a lack of awareness or having received the vaccination one month prior to conception. Regarding vaccine safety, 0.8% women (1/113, 95% CI 0.1% - 4%) believed the influenza vaccination is not recommended antenatally, is unsafe and harmful to both mother and newborn.

Discussion

Previous international and local data has demonstrated considerably low rates of antenatal influenza vaccination: 7% in France in 2016, 37% in the United States and 33% in Southwest Healthcare in 2017 [19]. Whilst our results show improvements from the 2017 South West Healthcare-specific data, only slightly over half of our pregnant women are currently receiving the influenza vaccination antenatally. Despite a significant majority of women stating that the influenza vaccine is both recommended and safe during pregnancy, antenatal immunisation remains low, 55%, in comparison to vaccination outside of pregnancy, 69%. Current guidelines recommend vaccination against influenza during each pregnancy due to the conferred immuno-protection to the newborn, demonstrated via elevated antibody levels in the mother's newborn [11, 12]. Accordingly, 45% of pregnant women are not benefiting from this conferred immuno-protection for their newborn.

In our cohort, 68% of women who were not vaccinated in the pregnancy reported willingness to undertake vaccination in pregnancy. Majority of this women did not receive the vaccine as they were unaware that current guidelines recommend re-vaccination to boost antibody immunity during pregnancy. This reiterates the importance for ongoing patient-centred education and antenatal vaccine endorsement from various healthcare professionals. Our study has shown recommendations for the vaccine from a range of healthcare professionals was associated with increase vaccine uptake (OR 3.15). Given that a significant proportion of women expressed a willingness to receive the influenza vaccine during pregnancy, this leaves a window of opportunity for healthcare professionals to increase vaccine uptake.

Previous studies have demonstrated women are more likely to accept vaccination with previous vaccination history, knowledge of influenza vaccine safety, recommendation from their health care workers [13, 14, 19], consistent with the findings of our study. 0.8% patients refused the vaccine as they perceived the vaccine to be harmful or unsafe during pregnancy. Clinical studies have shown no increased risk of fetal congenital defects among women who were vaccinated during pregnancy [1], including a 15 year review of 750 million doses of the vaccine which revealed no raised concerns regarding its safety for the fetus or mother [20]. Apart from regular recommendation of the vaccine, vaccine safety should be reiterated among women during their antenatal visit to encourage vaccine uptake.

Our study is not without limitations. To measure vaccine uptake, we relied upon patient self-reporting which can be subject to recall bias. Nevertheless, this methodology has been accepted as a satisfactory method of recording vaccine uptake amongst adults [15, 16] and had a high response rate of 95%. The questionnaire was written in simple English language and avoided medical jargon but was subject to the patient's comprehension of the questionnaire. Therefore, patients who required an interpreter were not able to participate in the study due to the lack of physically available interpreters in our health care system. Our findings were reported from a single-centre, which may not be representative of or generalizable to the wider pregnant women population. Furthermore, our questionnaire assessed risk perception of the vaccine itself but not perceived risk of infection during pregnancy and its association with vaccine uptake. Literature has demonstrated that women tend to underestimate the severity of the complications associated with antenatal influenza infection [18]. The associations found cannot be confirmed as causal due to the observational design.

Conclusion

Self-reporting a patient's feelings towards the vaccine reflects a patient's perspective of the consultation or healthcare worker's recommendation. There is a likelihood that healthcare professionals may be providing recommendations which are not adequately matching patient understanding. Future studies should aim to survey healthcare professionals regarding their understanding of the vital immuno-protection for the newborn, their likelihood to recommend the vaccination antenatally and perceived risk of influenza infection during pregnancy.

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Ethical approval

Full ethics approval was obtained from the hospital ethics board prior to commencement of the study.

Patient consent

Patient consent was obtained in writing before participation in the study. All participants are anonymised. Authors upheld privacy and confidentiality of patient clinical information.

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