COMMENTARY

Embedding the delivery of antenatal vaccination within routine antenatal care: a key opportunity to improve uptake

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ABSTRACT

Improving the uptake of vaccination in pregnancy has been highlighted as a priority by the World Health Organisation, yet establishing the optimal location for delivery of the antenatal vaccination program remains a topic of debate internationally. In many countries, antenatal vaccines are usually delivered within Primary Care (under the lead of general practitioners [GPs] or family physicians), yet this often presents a logistic barrier to accessing vaccination, and increasing evidence demonstrates that embedding vaccination within routine antenatal care visits may significantly improve uptake. In this commentary, we discuss recent evidence to support this approach, including anonymous feedback from patients and staff at our own institution, in which a dedicated midwife-led vaccine clinic has recently been set up. Furthermore, we highlight a number of individual and institution-level barriers which would need addressing before this approach can be routinely adopted, and suggest targets for future education and research.

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Introduction

Vaccination in pregnancy is an important global health strategy that protects young infants and mothers at a time when they are particularly vulnerable to infection.^{1,2} Antenatal vaccination against influenza is recommended by the World Health Organisation (WHO) and has been implemented across a number of countries since this recommendation.³ Antenatal vaccination against pertussis was first introduced in the United Kingdom (UK) and United States (US) in 2012, following national outbreaks of pertussis.⁴ Similar trends have since been observed globally, and at least 14 countries worldwide have adopted similar programs.³ Furthermore, a number of vaccines with an indication for use in pregnancy or pre-pregnancy are progressing through the development pipeline, including Respiratory Syncytial Virus (RSV), Cytomegalovirus (CMV) and Group B Streptococcus (GBS).³

Although initial uptake of antenatal vaccination was encouraging, coverage has since plateaued (particularly in developed countries), and improvement is required to ensure an optimal protection of mothers and infants.⁵ The WHO has, therefore, highlighted the need to identify and tackle socio-economic barriers to vaccine uptake.^{6,7} Antenatal vaccination uptake in the UK against influenza and pertussis over the 2017–2018 winter season was 47% and 73%,^{8–11} respectively; however, coverage rates vary markedly between different regions of the country.

Successful examples of educational interventions have included training for health-care professionals (HCPs)¹² and improved educational resources for pregnant women (such as

providing pamphlets in antenatal clinic,^{13,14} smartphone apps,¹⁵ text messages¹⁶, and social media¹⁷). Yet, while such interventions may improve intention to receive vaccination among pregnant women, this does not necessarily equate to the receipt of vaccination due to competing time pressures and priorities, and difficulty accessing vaccination.¹⁸ Establishing the optimal location for delivery of the antenatal vaccination program has, therefore, become a priority globally.⁵

Embedding vaccination within routine antenatal care

In many countries (including the UK, USA, Canada, and Australia) midwives and/or obstetricians are often the only HCP pregnant women have routine contact with during their antenatal care, and yet vaccination is usually delivered within Primary Care (under the lead of general practitioners [GPs] or family physicians). For many women, this may present a logistical barrier to accessing vaccination as it requires an additional appointment to those for routine antenatal care, and it is usually the women's responsibility to arrange this.^{19,20} This may be particularly inconvenient for women working full time, and those from culturally and linguistically diverse backgrounds. Additionally, it is recognized that mothers often value the expertise of their antenatal care provider above other sources of advice during pregnancy,²¹ and may, therefore, be more likely to accept a vaccine if recommended and administered by them.

Increasing evidence demonstrates that embedding vaccination into routine antenatal care visits can increase uptake of

both pertussis and influenza vaccination.^{22–28} Surveys of pregnant women have shown that many women find the model of primary care-delivered vaccination to be inconvenient, and that women are up to three times more likely to undergo vaccination if offered by their antenatal care provider.^{23,25} This is supported by prospective cohort studies demonstrating significant increases in uptake following the introduction of midwife-delivered vaccination programs.^{22,24} These include a multicenter study undertaken in Melbourne, Australia, in which two hospital-based antenatal immunization models (nurse- and midwife-led) were compared to primary care-delivered vaccination. The greatest improvement in vaccine uptake from baseline was seen following the introduction of standing orders allowing for midwife-administered vaccination (39% to 91%, $p < .001$) during routine antenatal visits.²⁴ Similarly, Mohammed *et al.* (2018) demonstrated large increases in the uptake of both pertussis (20% to 90%, $p < .001$) and influenza (32% vs 83%, $p < .001$) antenatal vaccination following the introduction of a midwife-delivered vaccination at their institution.²²

The American College of Obstetrics and Gynaecology and US Advisory Committee on Immunisation Practices has, therefore, recently recommended use of standing orders.²⁹ Furthermore, there are an increasing number of areas in the UK where successful initiatives have been set up (locally commissioned by National Health Service [NHS] midwifery services), many of which offer vaccination at the same time as the 20-week fetal anomaly scan visit.^{30,31} A dedicated midwife-led vaccine clinic has recently been set up at our own institution, offering vaccination appointments (either booked in advance or undertaken opportunistically) alongside routine antenatal visits. Formal feedback about this service from pregnant women and maternity HCPs (collected prospectively via an anonymous survey administered from October to November 2018) has been encouraging. The clinic was rated as “Excellent” or “Good” by 82% (82/100) of pregnant women and 81% (38/47) of the HCPs who responded. Furthermore, most pregnant women agreed that secondary care antenatal appointments were the optimal location for vaccine administration (61%, 58/95), followed by primary care (12%) and community midwifery appointments’ (6%), whilst 20% did not have a preference. Similarly, amongst HCPs, the most common preference was secondary care antenatal appointments (58%, 27/47), followed by community midwifery appointments (19%) and primary care (6%), whilst 17% had no preference.

What are the barriers to routine implementation of this approach?

A number of studies have indicated that there may be a mixed response from midwives and obstetricians as to whether this approach is desirable and feasible, and whether they feel adequately trained and prepared (on both an individual and institutional level).^{20,30,32–37} Whilst most would agree that vaccination is important and should be promoted opportunistically, individual barriers to administering vaccination themselves include perceived lack of knowledge/confidence in discussing the risks and benefits of vaccination with pregnant women (particularly amongst midwives), and a lack of formal training in vaccination – highlighting the need for

further education targeted at areas of particular need.^{30,32,33} There also remains a significant amount of uncertainty about who should bear responsibility for the recommendation and administration of vaccination amongst maternity staff.³⁴ Qualitative studies have revealed that even amongst those who recognize the importance of vaccination (and the potential implications of not doing so), vaccination remains a low clinical priority for them, particularly as many would not have experienced actual cases of pertussis/influenza as part of their practice, or in their local community.³⁸ There is evidence to suggest however that support amongst staff may grow after implementation of such a service, once they observe that it indeed works in practice.^{20,39}

Institution-level barriers may include short appointments for antenatal visits, inadequate staffing and resources, lack of a suitable setting and facilities for safe vaccine storage and delivery, and concerns about appropriate insurance and financial reimbursement.^{30,35,40} As well ensuring sufficient resources for the delivery of vaccination, it is important to note that resources and training must be in place to deal with any complications or side-effects that arise following vaccination. Whilst serious reactions to vaccination are extremely rare,⁴¹ the immediate onset and life-threatening nature of anaphylaxis necessitates that vaccine providers have resources in place for effective management. Finally, accurate tracking of pregnant women’s vaccination status is also important to consider, as this feeds directly into national surveillance of vaccine uptake. In England, for example, notification of vaccination must be communicated to the women’s GP, as national surveillance data are automatically extracted by Public Health England from individual GP practices.³¹

It should be noted that there remains a paucity of research regarding the views of GPs and family physicians toward the routine adoption of this approach.^{20,42,43} This is important, as primary care-delivered vaccination has been the traditional model of care for many countries, and support from GPs will be needed to ensure smooth implementation of a new service (especially given that many GP practices currently receive funding for the administration of vaccines). However, some recent studies (including a large survey of English GPs)⁴³ have identified that many feel a sense of disconnect from antenatal care, and there is indeed support for maternity health-care professionals in the community and Secondary Care to take greater responsibility for the promotion and administration of the antenatal vaccination program, and to embed this within routine antenatal visits. It is important to note, however, that even if antenatal vaccination programs are exclusively delivered within antenatal care, GPs will continue to have a role in providing advice to pregnant women opportunistically, and continued education of GPs will, therefore, be essential.

Conclusions

Mounting evidence suggests that embedding vaccination within antenatal care visits can improve uptake amongst pregnant women, yet a number of individual and institution-level barriers need to be addressed before this approach can be routinely adopted. Research would be beneficial within settings in which this approach has (and has not) been adopted, in order to

establish its feasibility and effectiveness, as well as facilitators/barriers to its acceptance amongst pregnant women and HCPs.

Given the diverse models of antenatal care between different countries (and regions within countries), we acknowledge that it is not feasible to expect a universal model of immunization delivery. Antenatal care-based vaccination programs should not necessarily replace primary care-delivered vaccination in settings where offering both approaches simultaneously is beneficial and practical (such as for influenza vaccination where a pregnant woman's 20-week visit may not occur within influenza season). Furthermore, in some antenatal care settings, establishing a dedicated immunization service may be unfeasible, in which case a more traditional model of primary care-delivered vaccination will continue. However, in such settings, it is key to ensure that at least the active promotion of vaccination occurs routinely as part of antenatal care in all settings. Possible strategies should include reminders for health-care staff (such as 'tick box' prompts) in antenatal care referral forms or notes, written educational resources for pregnant women available within their notes and at GP and antenatal clinics (particularly focussing on the benefits of vaccination for the infant³³), and easily accessible online guidance for staff.^{14,20}

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Author Contributions

C Wilcox drafted the manuscript, and the other authors critically revised the manuscript. All authors approved the final version of the manuscript. With regards to the Southampton vaccination clinic questionnaire study, all authors contributed to questionnaire design, study delivery, and data collection.

Ethical approval

Ethical approval for the Southampton vaccination clinic questionnaire study was obtained from the East of England-Essex research ethics committee (18/EE/0294).

Disclosure of potential conflicts of interest

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