Vaccination against pertussis and influenza in pregnancy: a qualitative study of barriers and facilitators

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Vaccination against pertussis and influenza in pregnancy: a qualitative study of barriers and facilitators

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Abstract

Objectives: Influenza and pertussis vaccination programmes have been in place for pregnant women in the UK since 2009 and 2012, respectively. In 2015, vaccine uptake rates were 55% for influenza and 63% for pertussis in Northern Ireland. We conducted a qualitative study with the aim of learning about the views of pregnant women and identifying potential barriers to vaccination in pregnancy.

Study design: Qualitative study using focus groups and in-depth interviews.

Methods: We conducted focus group discussions and interviews on vaccination in pregnancy using a discussion guide developed in consultation with stakeholders and service users. Pregnant women were recruited on-street and through community networks. We performed inductive coding of transcripts and thematic analysis, using a phenomenological approach.

Results: Sixteen pregnant women participated. We identified six key themes. *Information and knowledge*: Vaccinated and unvaccinated women demonstrated similar levels of knowledge and desire for information, preferring direct communication with healthcare professionals. *The influence of others*: Some vaccinated participants reported firm endorsements of vaccination by healthcare professionals including midwives, while some unvaccinated women recalled neutral or reticent staff. *Acceptance and trust*: Most women expressed trust of health professionals. *Fear and distrust*: Vaccinated individuals expressed concerns about side-effects more than unvaccinated women. A few unvaccinated women expressed distrust of vaccines and healthcare systems. *Responsibility for the baby*: Both groups prioritised protecting the baby but unvaccinated participants were concerned about vaccine-related harm. *Accessing vaccination*: Multiple appointments, lack of childcare, time off work and having responsibility to organise vaccination hindered some participants from getting immunised. Some women were willing to be vaccinated but did not recall being offered vaccination, or were not sufficiently motivated to make arrangements themselves.

Conclusion: Healthcare professionals appear to have a vital influential role in pregnant women's decisions about vaccination. Involving midwives and improving convenience of vaccination access may increase uptake. Strategies to develop interventions should address the aforementioned barriers to meet the pregnant women's needs.

Keywords

Vaccination, Immunisation, Pregnancy, Qualitative Research, Influenza, Pertussis

Introduction

Seasonal influenza and pertussis are common, but potentially serious, communicable diseases that can be prevented by vaccination. Seasonal influenza infection during pregnancy may result in serious complications for the woman, and the new-born, who can catch the infection from the mother.[1] Since the 2009 influenza A/H1N1 pandemic, pregnant women have been eligible for influenza vaccination at any stage of pregnancy during the influenza season.[2] Uptake for the 2015/16 seasonal influenza vaccine by pregnant women in Northern Ireland (NI) was 55%[3] and 42% in England.[4] The childhood pertussis vaccine greatly reduces the incidence of pertussis, but infants are at risk of pertussis-related hospitalisation and death before they are vaccinated or develop an adequate immune response.[5] Babies of women who receive pertussis vaccination during their pregnancy have a 90% reduced risk of pertussis during the first two months of life.[6,7] In 2012, the United Kingdom experienced a national outbreak of pertussis in infants too young to be vaccinated[8,9], leading to the recommendation that pregnant women be vaccinated for pertussis between 28 and 32 weeks of pregnancy to protect the infant via maternal antibodies.[9] This recommendation was extended and since 2016 pertussis vaccination can be given from week 16 of pregnancy.[10] In 2015, uptake of pertussis vaccination among pregnant women was estimated to be 63% in NI[11] and 58% in England.[12]

There is limited information available about whether low uptake of seasonal influenza and pertussis vaccinations by pregnant women is due to factors relating to the healthcare system, women's knowledge, attitudes and beliefs, social norms, or a combination of these factors. We designed and conducted a qualitative study to investigate the reasons why pregnant women receive, or do not receive, vaccination during pregnancy. The aim of the study was to provide information that would help us plan improvements to services that offer vaccinations to pregnant women.

Methods

Study design

We chose a qualitative study design to elicit information about pregnant women's knowledge, attitudes, beliefs and experiences relating to vaccination in pregnancy. We developed a discussion guide as part of a multidisciplinary group, including a midwife consultant, general practitioner, public health doctors and nurses, an epidemiological scientist, and an academic with experience of qualitative study design and conduct. The discussion guide was refined in consultation with members of a maternity services user reference group to ensure acceptability. We interviewed women in focus groups, separated by their vaccination status allowing freedom of different views to be expressed. In-depth interviews were planned with pregnant women from a migrant background to ensure the experience of migrant women was represented in the study. We commissioned a market research company that is accredited under the Interviewer Quality Control Scheme (http://iqcs.org) and certified to ISO 20252, ISO 9001 and ISO 27001 standards to recruit participants and facilitate focus group discussions at their facilities and in-depth interviews at the participant's home.

Research ethics statement

Research ethics approval was obtained from the NHS Health Research Authority, West Midlands - Coventry & Warwickshire Research Ethics Committee (REC reference number 17/WM/0076).

Recruitment

Pregnant women were opportunistically approached on-street (Table 1). To ensure diversity, the market research company aimed to recruit participants of different ages, social grades and number of previous pregnancies for each group. Potential participants who meet the inclusion criteria received an information leaflet and had a discussion with the recruiter. They

had a 'cooling off' period before consent was taken and interviews were conducted. The number of potential participants who declined was not recorded. The market research company offered participants £35 for participation.

[TABLE 1]

Data collection

Three focus groups and one in-depth interview were conducted. All participants gave written informed consent for participation and audio-recording.

We originally planned two focus groups, each with only vaccinated (against influenza and/or pertussis) or only unvaccinated women. However, during the first focus group session with vaccinated participants, one participant admitted she was unvaccinated. To ensure the opportunity to hear views of vaccinated women without influence of the unvaccinated participant, another focus group was conducted with two additional participants. We aimed to recruit one vaccinated and one unvaccinated migrant woman for in-depth interviews. Recruitment was found to be challenging and only one person with a migrant background (who was vaccinated and spoke English) was successfully recruited for an in-depth interview. All sessions were semi-structured using a discussion guide, facilitated by an experienced female researcher (with a BSc Psychology) from the market research company, who explained and emphasised her neutral role in this project. Focus group sessions lasted approximately 90 minutes and the interview lasted 45 minutes. The sessions were audio-recorded and transcribed verbatim by the market research company. The transcripts were provided in anonymised form and analysed independently by two researchers. Transcripts were not returned to participants.

Analysis

Thematic analysis using a six-step process[13] and inductive coding of transcripts was performed independently by two researchers using qualitative analysis software (NVivo 10;

QSR International Pty Ltd. V.10, 2012). Analysis was undertaken through a phenomenological lens. After coding the transcripts, analyses were compared and agreement between researchers obtained for all final coded data. Thematic analysis was performed and discussed to agree on key themes and ensure consistency. COnsolidated criteria for REporting Qualitative research (COREQ) were applied for reporting, analysis and interpretation.[14] A list of initial codes is available from the authors upon request.

Results

Study population

Three focus group discussions and one interview took place in March and April 2017. Focus groups included fifteen participants of different ages, social grades and included first-time and mothers who had previous pregnancies (Table 2). All women were at least 16 weeks pregnant at the time of recruitment (February-March 2017) and hence, eligible for both vaccinations during their current pregnancy.

[TABLE 2]

Themes

We identified six themes that described reasons why pregnant women choose to get or to not get vaccinated in pregnancy (Table 3).

[TABLE 3]

Information and knowledge

Participants received information on vaccinations in different ways, mostly from doctors and midwives, but also from friends and family. Most participants felt that some healthcare professionals did not spend enough time discussing benefits and risks of vaccination, or were not able to address their questions.

Speak to us more instead of just giving you a leaflet, because no matter who you see, be it a doctor or a midwife, it's flooded with leaflets, they are rushed to get you in and out that door as quickly as possible. ... [P2-FG3, vaccinated]

Generally, participants did not understand how vaccinations work. Most participants were more aware of influenza than pertussis. The influenza vaccine was often seen as pointless, with some believing it could cause influenza infection. A minority questioned the value of vaccination, regardless of vaccination status. Some believed that "too many" vaccinations were given. Some vaccines were thought to be more important than others. Some believed that as they had not previously been ill, they would not become ill in the future, and did not require vaccines.

Some women researched vaccination using different online sources to compare with information provided by the public health service. Most women reported that receiving the public health leaflets without further explanation was unhelpful, and some women were not sure if they received the leaflets. Participants felt there was a need for impartial information and advice from healthcare professionals.

There's no impartial advice about vaccinations there, either, if you go in the internet, its either very positive or very negative. There's no, ok, this is exactly what could happen… [P4-FG1, vaccinated]

Influence of others

Midwives had the potential to be a positive influence on pregnant women by encouraging vaccination. A lack of vaccine endorsement by the healthcare professionals led some to believe vaccination was not important. Many unvaccinated participants claimed they would have the vaccines if they had been recommended by a healthcare professional.

… My midwives weren't pushy or anything towards it. 'You get vaccinated at this stage and you make your appointments.' They were quite laid back about it all, and I

think that's what made me laid back about it all. … No one was forcing me to make the appointments to have it ... So I didn't think that it was very important... [P1-FG2, unvaccinated]

Some participants suggested a need for better training for healthcare professionals on discussing vaccination, and allowing more time for discussion in face-to-face appointments may influence vaccine acceptance.

One unvaccinated woman said that she had been influenced by her partner, who was opposed to vaccination for reasons she ascribed to his cultural background.

I wouldn't be so worried about it, vaccines and that, but he [partner] would be. … And because of where he is from, he doesn't like them [participant's children] having it. [P3-FG2, unvaccinated]

Acceptance and trust

Most participants, even if unvaccinated themselves, expressed acceptance of vaccination in pregnancy. These participants trusted healthcare professionals and were happy to follow their advice. Most thought vaccines would not be recommended if they caused harm and many women did not differentiate between vaccination during or outside pregnancy.

Sure the baby gets vaccinated anyway. So if you are going to have your child vaccinated does it matter if it's during pregnancy or not? If it is that big of a risk, then they wouldn't offer it you. [P7-FG2, unvaccinated]

Some mentioned difficulty building trust if they did not get to see the same healthcare professional during pregnancy.

Like you never see the same midwife, you never, you're booking in appointments, you're there about two and a half hours when you are booking in, and I really think

that the midwife that books you in that she should pop in and see you every now and again. ... [P3-FG1, vaccinated]

Another form of acceptance expressed by some participants was that "ignorance is bliss" and some felt that no further investigation into the topic of vaccinations was best.

Fear and distrust

Vaccinated participants expressed fear of pain of vaccination and early side-effects. Some unvaccinated women were concerned about unknown longer-term consequences. Some suspected healthcare professionals did not know, or would not truthfully disclose, information about possible risks.

That's why they aren't giving you information out because they don't have enough information themselves. Like even today when I just got the Whooping one… my arm's getting sore now, like I wasn't told that was the way it would go, that there are side effects or what to look out for or anything. [P4-FG1, vaccinated]

Amongst unvaccinated participants, two expressed clear anti-vaccination views. One thought that components of vaccines could harm their baby. Some participants referred to the measles-mumps-rubella (MMR) vaccine, relating it to the (discredited) autism scare of the 1990s.

I think I am inclined that if I definitely had to have a vaccination, then I wouldn't take it during pregnancy. The chances of the baby being infected by the things in there, the levels of mercury and aluminium, if that's ingested and the baby is going through a key development early on, it can affect their kidneys, liver, organs. [P5-FG2, unvaccinated]

The opinion that nature was best for your body was also expressed by some. Some participants reported they were anxious about taking medication during pregnancy, and found the advice about vaccination inconsistent with this view.

Responsibility for the baby

Many participants expressed responsibility for their baby and described being very protective once becoming pregnant, especially with a first child. Both groups expressed that it was more important to protect the baby than themselves. However, not all recognised that vaccinations are intended to protect the baby. Some unvaccinated participants wanted to protect the baby from a vaccine they considered to be potentially harmful.

One vaccinated participant expressed anticipated regret, saying she would blame herself if her baby became sick due to being unvaccinated. Conversely, another vaccinated participant said that she would blame herself if her child became unwell due to being vaccinated.

> *That's why I went for it, because I had listened to so much information, and my gut was telling me so. Because of the baby inside me, I couldn't take the risk of anything happening and then me blaming myself … I didn't really want to know anything else about it, because too much information was going to confuse me.* [P3-FG1, vaccinated]

Accessing vaccination

Most vaccinated women had not experienced difficulties accessing vaccination. In the unvaccinated group, some said they simply did not get around to booking their appointments. Some reported they were not offered vaccinations.

> *Like with me, I am just really lazy with these kinds of things. Like people say that you need to put an appointment on, but they don't push you, so if you don't do it, then you don't do it. Like, I never really got round to making it the first time, so what difference does it make this time?* [P3-FG2, unvaccinated]

Some women thought attending a general practitioner (GP) for vaccination was inconvenient. One suggestion to improve access to vaccination was to have fewer

appointments and to coincide the vaccination with antenatal appointments, possibly given by midwives. Lack of time, responsibility of organising appointments, time off work and difficulty accessing childcare were among barriers participants mentioned.

Discussion

Vaccination against pertussis and influenza during pregnancy is a safe, simple and potentially life-saving intervention. A sizeable minority of the eligible population does not get vaccinated. We identified possible reasons for women not being vaccinated, and suggest strategies that might improve uptake.

There has been little previous research about the factors affecting vaccination of women in pregnancy against influenza and pertussis, particularly in the context of the UK.[15] Winslade *et al.*[12] recently reported findings of a qualitative study of views of women about pertussis vaccination in London. Many of the findings of our study and Winslade *et al.* are in alignment, despite differences in study design (individual interviews versus focus groups), vaccination of focus (pertussis only versus pertussis and influenza), and context (socioeconomic and cultural differences between London and Northern Ireland). Participants in the Winslade study were not required to be currently pregnant.

Some women claimed to be willing to be vaccinated but said vaccination was not offered, which is consistent with other studies.[12,16] If this is an omission on the part of healthcare professionals, then a system design approach could be applied to increase the number of pregnant women offered vaccines. One solution might be to introduce a checklist for maternity appointments, such as that suggested by Winslade *et al.*.[12] It is possible that healthcare professionals offer vaccination in such a way that some women do not recognise the pertinence of vaccination and thus do not remember this advice. A full understanding of the system in which women are treated might maximise opportunities to implement clearer and more effective communication strategies.

Other women had not made appointments to be vaccinated. Vaccine uptake among pregnant women tends to be higher when recommended by a healthcare professional.[17–20] Midwives are pivotal[21] and were among the most trusted in our study.

We found, as have previous reports, that pregnant women preferred to discuss vaccination face-to-face with a trusted healthcare professional.[12,17,21,22] The role of healthcare professionals, especially midwives, is crucial in providing impartial information and reassuring pregnant women about the safety of the vaccine and its benefits for mother and child. In an online survey with pregnant women and women with children under two years of age in the UK the majority indicated they would definitely or probably accept a nationally-approved pertussis vaccine offered by their midwife or GP during pregnancy to protect themselves and/or their baby.[23] If the vaccine is more promoted for protecting the new-born than the mother, participants seem more willing to accept the vaccine[21,24], which is also suggested by our finding thatprotecting the baby was a main theme in both groups. High vaccination uptake has been attributed to the involvement of GPs[25] and several studies have reported that women are much more likely to accept vaccination in pregnancy when advised and recommended by a healthcare professional.[19–21] Endorsement of the vaccine by healthcare professionals, particularly midwives, was very important to many pregnant women in our study. The apparent lack of endorsement by healthcare professionals warrants further study. Possible reasons include lack of knowledge, belief, time or confidence speaking about vaccine decision-making. Healthcare professionals' confidence can be increased by training.[26]

We found that vaccinated women were not necessarily better-informed than unvaccinated women, and that information provision did not necessarily promote informed decision-making, as wrong information and knowledge were relatively common. Confronting incorrect information about vaccines is challenging: drawing attention to the information even to discredit it might risk promoting it.[27]

A small number of unvaccinated women in our study were vaccine-refusers and discussed their belief that vaccines would cause harm. However, efforts should be targeted to unvaccinated but willing individuals as most vaccinated participants accepted vaccines despite some concerns.

We found some participants were concerned about vaccination during pregnancy. Counterintuitively, vaccinated individuals expressed more concern about vaccine side-effects. Previous studies described mixed views about vaccine safety as a major concern.[15,16] It may be possible to address these concerns in direct discussions with healthcare professionals.

Ethnicity may have an impact on the decision to get vaccinated.[17,18] We were not able to explore this in any depth in our study as we were able to recruit only one participant who was a migrant, and she was vaccinated. Future studies should explore this in greater detail, perhaps recruiting people from different migrant backgrounds.

Our study was limited by funding and relatively short timescales. Participants were from a small geographical area around Belfast; therefore, generalisability of findings to individuals from other regions may be limited. Inclusion of an unvaccinated participant in the first vaccinated group might have influenced other participants. However, the content of discussion in an additional focus group was similar, suggesting there was no significant influence, although data saturation was not discussed. We cannot be confident that data saturation was reached with respect to the views of immigrant women as only one woman was interviewed and therefore further interviews would need to be undertaken. Due to difficulties recruiting migrant women, a dedicated recruitment strategy would be necessary in future studies

Our study highlights the critical role of healthcare professionals, especially midwives, in recommending vaccination in pregnancy. We also highlighted the need for a better approach to vaccination reminders, appointments and delivery. As a result of this study, we are exploring new approaches to vaccines being delivered by midwives in routine ante-natal care appointments.

References

1. Yudin MH. Risk management of seasonal influenza during pregnancy: Current perspectives. Int J Womens Health. 2014;6(1):681–9.

2. Knight M, Kenyon S, Brocklehurst P, Neilson J, Shakespeare J, Kurinczuk J. Saving Lives, Improving Mothers' Care - Lessons learned to inform future maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2009--12. Mbrrace Uk. 2014.

3. Nugent C, Gallagher N, Johnston J. Surveillance of Influenza in Northern Ireland. 2015;4.

4. Public Health England. Influenza immunisation programme for England GP patient groups Data collection survey Season 2015 to 2016 About Public Health England. 2016.

5. Jankinovich A, Sood SK. Pertussis: still a cause of death, seven decades into vaccination. Curr Opin Pediatr. 2014;Oct,26(5):597–604.

6. Amirthalingam G, Andrews N, Campbell H, Ribeiro S, Kara E, Donegan K, et al. Effectiveness of maternal pertussis vaccination in England: an observational study. Lancet. 2017 Aug 20;384(9953):1521–8.

7. Baxter R, Bartlett J, Fireman B, Lewis E, Klein NP. Effectiveness of Vaccination During Pregnancy to Prevent Infant Pertussis. Pediatrics. 2017 Apr 3.

8. Atchison CJ, Hassounah S. The UK immunisation schedule: changes to vaccine policy and practice in 2013/14. JRSM Open. 2015;6(4):2054270415577762.

9. Amirthalingam G. Strategies to control pertussis in infants. Arch Dis Child. 2013;98(1468–2044 (Electronic)):552–5.

10. Amirthalingam G, Campbell H, Ribeiro S, Fry NK, Ramsay M, Miller E, et al. Sustained effectiveness of the maternal pertussis immunization program in England 3 years following introduction. Clin Infect Dis. 2016;63(July 2014):S236–43.

11. Annual Immunisation and Vaccine Preventable Diseases Report for Northern Ireland. 2015.

12. Winslade CG, Heffernan CM, Atchison CJ. Experiences and perspectives of mothers of the pertussis vaccination programme in London. Public Health. 2017;146:10–4.

13. Braun V, Victoria Clarke. Using thematic analysis in psychology. Qual Res Psychol. 2006;3(December 2014):77–101.

14. Tong A, Sainsbury P, Craig J. Consolidated criterio for reporting qualitative research (COREQ): a 32- item checklist for interviews and focus group. Int J Qual Heal Care. 2007;19(6):349–57.

15. Wilson RJ, Paterson P, Jarrett C, Larson HJ. Understanding factors influencing vaccination acceptance during pregnancy globally: A literature review. Vaccine. 2015;33(47):6420–9.

16. Maertens K, Braeckman T, Top G, Van Damme P, Leuridan E. Maternal pertussis and influenza immunization coverage and attitude of health care workers towards these recommendations in Flanders, Belgium. Vaccine. 2016;34(47):5785–91.

17. Healy CM, Rench MA, Montesinos DP, Ng N, Swaim LS. Knowledge and attitiudes of pregnant women and their providers towards recommendations for immunization during pregnancy. Vaccine. 2015;33(41):5445–51.

18. Laenen J, Roelants M, Devlieger R, Vandermeulen C. Influenza and pertussis vaccination coverage in pregnant women. Vaccine. 2015;33(18):2125–31.

19. Wiley KE, Cooper SC, Wood N, Leask J. Understanding Pregnant Women's Attitudes and Behavior Toward Influenza and Pertussis Vaccination. Qual Health Res. 2014 Sep 22;25(3):360–70.

20. Mak DB, Regan AK, Joyce S, Gibbs R, Effler P V. Antenatal care provider's advice is the key determinant of influenza vaccination uptake in pregnant women. Aust New Zeal J Obstet Gynaecol. 2015;55(2):131–7.

21. Regan AK, Mak DB, Hauck YL, Gibbs R, Tracey L, Effler P V. Trends in seasonal influenza vaccine uptake during pregnancy in Western Australia: Implications for midwives. Women and Birth. 2016;29(5):423–9.

22. Donegan K, King B, Bryan P. Safety of pertussis vaccination in pregnant women in UK: observational study. BMJ. 2014;349(9526):g4219.

23. Campbell H, Van Hoek AJ, Bedford H, Craig L, Yeowell A-L, Green D, et al. Attitudes to immunisation in pregnancy among women in the UK targeted by such programmes. Br J Midwifery. 2015;23(8):566–73.

24. Naidu MA, Krishnaswamy S, Wallace EM, Giles ML. Pregnant women's attitudes toward antenatal pertussis vaccination. Aust New Zeal J Obstet Gynaecol. 2017;57(2):235.

25. Wiley K, Regan A, McIntyre P. Immunisation and pregnancy - who, what, when and why? Aust Prescr. 2017;40(4):122–4.

26. Vishram B, Letley L, Jan Van Hoek A, Silverton L, Donovan H, Adams C, et al. Vaccination in pregnancy: Attitudes of nurses, midwives and health visitors in England. Hum Vaccin Immunother. 2018 Jan;14(1):179–88.

27. Nyhan AB. Effective Messages in Vaccine Promotion : A Randomized Trial. 2018;133(4):1–8.

Table Captions

Table 1: Description of the study inclusion and exclusion criteria.

Table 2: Description of the study population.

Table 3: Names of the themes that emerged from analyses.

Supplemental Files

Supplementary file 1: COnsolidated criteria for REporting Qualitative research (COREQ) checklist