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Acceptability of immunization in adult contacts of infants: Possibility of expanding platforms to increase adult vaccine uptake

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ABSTRACT

Objective: Adult vaccination coverage is low and current strategies are unlikely to achieve Healthy People 2020 targets. We determined the attitude of adult infant contacts toward recommended adult vaccines and their willingness to receive vaccines should they be available during hospital visits or prenatal or infant clinic appointments.
Methods: Survey of predominantly Hispanic, underinsured and medically underserved infant contacts at a county hospital in Houston, Texas where a pertussis cocooning program is offered.
Results: Two hundred and eighty-five contacts (mean age 32.8 years [18–73]; 94.8% Hispanic) participated. Most were fathers (58.2%), followed by aunts (19%), and grandparents (12.3%). Participants used many health information sources. 221 (77.5%) considered healthcare providers the most influential on their decisions but only 51.6% reported healthcare visits within the prior year. Forty-one (14.4%) discussed family vaccinations during prenatal visits. Preferred locations for adult vaccination were hospital or clinic-based (96.5%). Lack of knowledge (22.8%), fear of pain/needles (14.7%), work commitments (14%), lack of transport (11.2%), cost (10.2%) and fear of side effects (5.3%) were barriers to vaccination. More males than females reported fear of pain/needles and work commitments (P 0.01 and P 0.02, respectively), and more females lack of transport ($P < 0.001$) as barriers. Most planned to (76.1%) or had received (7%) pertussis vaccine; if available, 73.3%, 53.3% and 50.5% expressed willingness to receive vaccines against influenza, pneumonia and meningitis, respectively. Age, ethnicity or education was not associated with willingness to be vaccinated. Vaccine acceptance was higher in females than males for pertussis (P 0.04), influenza (P 0.008), pneumonia (P 0.04), and meningitis (P 0.006) vaccines by multiple regression analysis.
Conclusions: Most adults were willing to be vaccinated if offered during hospital visits or clinic appointments for mother or infant. Development and expansion of recommended immunization platforms, such as the cocooning platform, offers the opportunity to increase adult vaccination coverage.

1. Introduction

Immunization is recommended throughout life to prevent vaccine-preventable diseases (VPD), VPD-associated morbidity and mortality and to prevent ongoing transmission of infections within the community. Despite achieving excellent infant and childhood vaccine uptake in the United States (US) [1], national vaccination coverage in adults is low [2,3], thus making adults susceptible to VPDs and important modes of transmission of infection. Achieving optimal vaccination coverage in adults has proven especially challenging. Despite influenza vaccine being recommended for all adults [4], and even after experiencing the 2009 H1N1 influenza pandemic, seasonal influenza vaccine coverage during the 2012–2013 season remained under 50% in adults age 18 years or older[2], far below the Healthy People 2020 target of 80% set by the Centers for Disease Control and Prevention (CDC) [5]. Similarly, although tetanus, diphtheria and acellular pertussis (Tdap) booster vaccine was recommended for adults in 2006 [6], and despite numerous well-publicized pertussis outbreaks and media

Abbreviations: VPD, vaccine-preventable disease; US, United States; CDC, Centers for Disease Control and Prevention; Tdap, tetanus, diphtheria and acellular pertussis vaccine; BTGH, Ben Taub General Hospital.

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reports that annual reported pertussis cases are increasing in the US [7], the most recent national data (2011) demonstrate that only 12.5% of adults aged 19 through 64 years have ever received Tdap vaccine [3]. Notable disparities also are seen in adult vaccine coverage [8]. Male influenza vaccine coverage is lower than female for all age groups and disparities based on race/ethnicity also occur with rates of coverage in black and Hispanic individuals lagging behind those of other groups [2,3].

The use of new initiatives and locations other than the medical home to administer vaccines will be necessary to successfully eliminate health disparities and attain the Healthy People 2020 targets for adult vaccination coverage, given the failure of current strategies to achieve that goal [5,9–11]. Optimizing targeted immunization strategies such as cocooning (immunizing infant contacts against influenza and pertussis) that already are recommended by the CDC, offer one such opportunity. Increasing vaccination coverage in this cohort of adults would contribute to achieving herd immunity. It would potentially have the bonus of direct and indirect protection to infants too young to have completed their primary immunization series who have disproportionately high risks of acquiring VPD, either because vaccines are not available for their age (influenza) or because multiple doses are required to confer immunity (pertussis) [12]. Attitudes of pregnant and postpartum women to vaccination, particularly influenza, have been studied [13–16], but there is a relative paucity of research examining the acceptability of vaccination to other adults who are contacts of newborn infants, many of whom may not have access to or choose not seek out regular preventive healthcare visits. We surveyed adult contacts of newborn infants in a large metropolitan county hospital to determine their knowledge of and attitude toward current adult immunization recommendations, perceived barriers to receiving vaccines, and willingness to receive vaccines on site should they be available.

2. Methods

2.1. Study population

The survey was conducted at Ben Taub General Hospital (BTGH), Houston, Texas. BTGH is one of two major public hospitals in the tax-supported Harris Health System. BTGH serves a largely underinsured, medically underserved, predominantly Spanish-speaking population and approximately 4000 live-born infants, predominantly of Hispanic ethnicity (>90%), are delivered there annually. Since 2008, a pertussis cocooning program at BTGH has offered Tdap vaccine free of charge to postpartum women and adult contacts of newborn infants who have not previously been immunized [17]. This program does not offer other recommended adult vaccines but provides education that vaccines are recommended for adults, and distributes information on alternative locations where they may be accessed.

A convenience sample of contacts 18 years of age or older, other than the mother, of infants recently delivered at BTGH were invited to participate. Adult contacts who were visiting an infant in the well-baby nursery or in the neonatal intensive care unit, or who accompanied the infant to a general pediatric clinic appointment within the first six weeks of life were approached by cocooning program personnel who explained the study. Contacts who consented to participate then completed a verbally-administered, 22 question, anonymous survey in English or Spanish, depending on their preference, prior to receiving education about pertussis and other recommended adult immunizations. Multiple contacts of an infant could participate but these data were not collected.

Surveys assessed demographics, whether vaccination of the infant or infant contacts had been discussed and if so, by whom; all sources of information used for information about immunization; their single preferred source of health information; all perceived barriers to receiving immunizations; opinions on cocooning; whether participants intended to receive Tdap vaccine; and participant willingness to receive other specific vaccines should they be available on-site that day. Possible choices for the latter question included vaccines recommended for all infant contacts (e.g., influenza) and other vaccines that may be recommended for adults in special circumstances (pneumonia and meningitis vaccines) in an attempt to determine if vaccine attitudes depended on a participant perception of disease severity (as, for example, with meningitis). Survey questions were in multiple-choice format with more than one answer possible, apart from specific questions regarding demographics, questions asking for a single opinion, or when asked to explain an answer. The study was reviewed and approved by the Institutional Review Boards of both Baylor College of Medicine and the Harris Health System.

2.2. Statistical analysis

Descriptive characteristics were assessed. Statistical significance for dichotomous outcomes was determined by chi square and Fisher exact tests. Normally distributed data were evaluated by means and the Student's *t* test; where positive or negative skewing of data occurred, statistical significance was calculated by medians and the Mann–Whitney *U* test. Multiple logistic regression analysis accounted for potential demographic confounders when examining gender-specific opinions. Statistical analysis was performed using SPSS version 21.0 (SPSS, Chicago, IL).

3. Results

3.1. Study population

Two hundred and eighty-five adult contacts of newborn infants (mean age 32.8 years; range 18–73) completed the survey between September 2011 and January 2013. Participant characteristics are summarized in Table 1. Male participants were younger than female (mean age 31.2 years [range 18–68] versus 38.1 years [range 19–73]; $P < 0.001$) and were more likely to be in the 18–49 year age group (97% versus 84%; $P < 0.001$). Fathers of newborns accounted for the majority of participants (58.2%), followed by aunts (19%) and grandmothers (10%). The majority of respondents (94.8%) was of self-reported Hispanic ethnicity and was uninsured (71.9%) or covered only by county-provided fee-for-service safety net plans (19%). Two hundred seventy-three participants (95.8%) stated they had received recommended vaccinations during childhood; seven (2.5%) said they had not been vaccinated and five (1.7%) were unsure.

3.2. Information sources

Respondents utilized a wide variety of sources to obtain health information for both themselves and their newborn infant. Most obtained information through personal discussions with healthcare providers (HCP), family or friends rather than printed or internet sources (Fig. 1). Two hundred twenty-one respondents (77.5%) considered a HCP—physician, midwife, or nurse—their single most important and trusted source of health information.

3.3. Education about immunizations and healthcare utilization

Forty-one respondents (14.4%) reported having a discussion about immunizations recommended for them prior to the birth of their infant contact. Twelve of twenty-nine (41%) who gave details on this discussion reported it was with a HCP (four physician, one

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