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Parent and provider perspectives on immunization: Are providers overestimating parental concerns?

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ABSTRACT

Objectives: Data are limited on whether providers understand parental attitudes to recommended childhood immunizations. We determined parental attitudes and assessed how accurately providers estimated parental opinions.
Methods: Survey of parents and providers (pediatricians, nurses, medical assistants) in randomly selected practices in Houston, Texas. Surveys assessed demographics, perceptions of immunization importance, safety and efficacy, and acceptability of vaccine delivery. Providers estimated parental responses.
Results: 401 parents (82% mothers, 12% fathers, 6% other) and 105 providers participated. Parents thought vaccines were important for health (median score 9.5; 0 = not important, 10 = extremely important) but also were concerned regarding vaccine safety and side effects (8.9 on 0–10 scale). 309 (77%) agreed that vaccines effectively prevent disease. Route of administration mattered to 147 (37%), who preferred injection (9.0) over oral (7.3) or intranasal (4.8) routes. Although parents would prefer three or fewer injections per visit, preventing more diseases (189 [47.6%]) was more important than number of injections (167 [42.3%]) when deciding the number of vaccines allowed per visit. White parents rated vaccines less important in preventing some illnesses than did non-white ($P \leq 0.006$ for meningitis, hepatitis, HPV, influenza and rotavirus) and rated number of injections per visit more important than number of diseases prevented (51.6% white versus 34.2% non-white; P 0.002). Providers underestimated parental attitudes toward vaccine importance (particularly influenza and HPV), and overestimated the proportion of parents who thought route of administration mattered (63%) and that number of injections per visit was the most important factor (76%) around parental vaccine decisions ($P < 0.001$ for parent–provider mismatch).
Conclusions: Most surveyed parents believe vaccines are important for child health and rate disease prevention higher than number of injections entailed. Providers underestimate the importance of some vaccines to parents and overestimate parental concerns regarding route of administration. Future research should focus on how this mismatch impacts parental vaccine decisions.

1. Introduction

Control of vaccine-preventable diseases in children depends on compliance with the immunization schedule recommended by the Centers for Disease Control and Prevention (CDC), but compliance becomes more challenging as new vaccines are recommended. The success of the immunization program may result in some parental complacency regarding the potentially debilitating or fatal consequences of vaccine-preventable diseases [1]. This misperception combined with inaccurate information about vaccine safety, has led to vaccine-hesitancy among some parents and the evolution of communities where the majority of parents seek exemptions from immunization [2–5] rendering their communities vulnerable to outbreaks of vaccine-preventable diseases (VPD) [5–9]. It is estimated that as many as 85% of providers encounter parental refusal of some vaccines annually [10]. Vaccine safety is the prominent concern [10,11], but parental demographics, family knowledge and attitudes about vaccines, the number of vaccines recommended, perception of disease risk, access to preventive healthcare, cost and time constraints also likely have an effect [2,10,12–16].

Provider attitudes toward and education about vaccines influence compliance with immunization recommendations. Provider, particularly physician, parent communications significantly impact parental concerns and behavior, especially for vaccine-hesitant

Abbreviations: CDC, Centers for Disease Control and Prevention; VPD, vaccine-preventable disease; MA, medical assistant; CHIP, Children's Health Insurance Program; Hib, Haemophilus influenzae type b; HPV, human papillomavirus.

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parents [10,17–22]. However, providers may be guided in patient discussions by their own bias or their perception of parental concerns which, if inaccurate, may impact the communication and subsequent parental decisions. In addition, providers may have personal vaccine safety concerns especially if they use Internet sources of inaccurate information [23]. The opinion of providers who are not physicians (e.g. nurses, medical assistants (MAs)) but who interact with parents, serve as a source of advice, and administer vaccines is not defined and may be important. We aimed to assess parental attitudes to immunization, examine factors that potentially influence their immunization decisions and determine if providers accurately estimated parental responses.

2. Methods

2.1. Study population

This was a convenience sample of parents and providers in primary care offices in Houston, Texas. Pediatricians were randomly chosen from the Harris County Medical Society directory and their practices were contacted by mail or email and invited to participate. Offices that expressed interest in participating were visited by investigators who explained the study. Once an office agreed to participate, a practice study visit was arranged where investigators invited parents and guardians (hereafter "parents") of children, of any age, presenting for care to the office that day to complete a short, anonymous survey. Inclusion criteria for parents included a willingness to participate and the ability to complete the survey in English or Spanish. Parents whose children were identified by office staff as acutely ill at the time of the visit were not approached because concerns about their child could potentially bias parental responses. Providers (physicians, nurses, MAs) in that office were also asked to complete an anonymous survey. This study was approved by the Institutional Review Board of Baylor College of Medicine.

2.1.1. Data collected

Surveys assessed parental preferences and comfort level with immunization. Using check boxes and visual analog scales, parental surveys assessed the importance attached to immunizations for their children's health, the importance of vaccines in preventing illnesses such as meningitis (*Haemophilus influenzae* type b (Hib), pneumococcus, meningococcus), respiratory disease (pertussis, influenza), hepatitis (hepatitis A and B), diarrhea (rotavirus) or cervical cancer (human papillomavirus vaccine (HPV)), their perception of vaccine efficacy, whether they were generally concerned regarding vaccine safety, whether mode of vaccine administration affected acceptability, the maximum number of injections acceptable per visit and acceptable waiting time for vaccine administration after a healthcare visit. Parental demographic information (gender, race/ethnicity, insurance status, age), and the age and gender of the child about whom the survey was completed were gathered. Providers, who were aware parents and providers in multiple practices were being surveyed, were asked to estimate overall parental responses to questions asked in the parental survey, and were also asked to score their own personal concern about vaccine safety, what they (providers) personally considered the most important factor when deciding how many vaccines to administer in a single visit and what they considered the maximum acceptable waiting time for vaccine administration. Demographic data collected on providers included their professional role, age, race/ethnicity, estimates for the number of patients seen each week and insurance status of patients for whom they provided care. Questions addressing preferences or comfort levels on both surveys were scored on a 10-point scale where 0 indicated "not important" and 10 "extremely important"; this visual analog scale was selected to detect small parental–provider differences and improve the precision of observations. All survey questions, parent and provider, were piloted among pediatricians specializing in academic general pediatrics, infectious diseases and adolescent medicine.

2.1.2. Statistical analysis

Statistical analysis was performed using SPSS version 20.0 (SPSS, Chicago, IL). Descriptive characteristics were assessed for parents and providers. Parental answers and provider estimates for parental answers, from the combined participating practices, were compared regarding beliefs around vaccine importance and efficacy, importance of route of administration and the most important factor governing the maximum number of injections parents allow in a single visit. Statistical significance for dichotomous outcomes was determined by chi-square and Fisher exact tests. Normally distributed data were assessed by means and the Student's t test; for non-parametric data, significance was assessed by medians and the Mann–Whitney U test. Multiple logistic regression analysis accounted for potential demographic confounders when examining race/ethnic-specific opinions.

3. Results

Thirty-one pediatric practices were randomly selected. Eight declined to participate and nine did not respond to the invitation. Fourteen practices (45%) were visited to explain study procedures; all agreed to participate but pre-determined parent and provider recruitment was complete before visits were scheduled for two practices. Four hundred and one parents of 499 (80%) invited to participate completed surveys; reasons for refusal were not collected. One hundred and five providers, representing a convenience sample of those working on the study visit day, participated. Physicians from all practices participated; the proportion of physicians participating for individual practices was not collected. Parent and provider demographics are in Table 1. Two hundred and seventy-seven parents (69.1%) had private health insurance, 107 (26.7%) had coverage provided by Medicaid or Children's Health Insurance Program (CHIP) and the remainder were uninsured. Fifty-eight providers reported (55.2%) caring for patients with private health insurance only, 45 (42.8%) saw a mixture of children with private insurance, CHIP and Medicaid and the remaining two (2%) saw both insured and uninsured children.

3.1.1. Perceived importance of vaccines

Parents believed that vaccines were very important to children's general health, and in preventing specific illnesses (meningitis, respiratory illness, diarrhea, hepatitis, cervical cancer) with median scores > 9 on a scale of 0–10. Providers agreed these illnesses were important to parents but underestimated parental scores for all except diarrhea; differences were small except for disparities for influenza and for HPV (Table 2). When providers were analyzed by their role (physician, nurse, MA) each underestimated parental scores; physicians accounted for greater parent–provider disparity for hepatitis (P 0.004) and influenza (P 0.32) vaccines (Table 2).

3.1.2. Beliefs around vaccine efficacy and concerns regarding safety

Three hundred and nine parents (77%) believed that vaccines prevent illness all or most of the time, 36 (9%) responded some of the time and 26 (7%) replied that it depended on the disease. The corresponding provider estimates of parental answers to these questions were 92 (87%), eight (7.6%) and three (2.8%), respectively. Parents scored 8.9 out of 10 when asked if they were generally