Parental Attitudes Toward Multiple Poliovirus Injections Following a Provider Recommendation

Maureen S. Kolasa, RN, MPH[a]
Kristine M. Bisgard, DVM, MPH[a]
D. Rebecca Prevots, PhD, MPH[a]
Shalini N. Desai, MPH[a]
Karen Dibling, RN[b]

SYNOPSIS

Objectives. Changes to the polio vaccination schedule, first to a sequential inactivated poliovirus/oral poliovirus (IPV/OPV) schedule in 1996 and most recently to an all-IPV schedule, require infants to receive additional injections. Some surveys show parental hesitation concerning extra injections, whereas others show that parents prefer multiple simultaneous injections over extra immunization visits. This study describes parental behavior and attitudes about the poliovirus vaccine recommendations and additional injections at the 2- and 4-month immunization visits.

Methods. Beginning July 1, 1996, providers in eight public health clinics in Cobb and Douglas Counties, Georgia, informed parents of polio vaccination options and recommended the IPV/OPV sequential schedule. A cross-sectional clinic exit survey was conducted from July 15, 1996, to January 31, 1997, with parents whose infants (younger than 6 months) were eligible for a first poliovirus vaccination.

Results. Of approximately 405 eligible infants, parents of 293 infants were approached for an interview, and 227 agreed to participate. Of those 227 participants, 210 (92%) parents chose IPV for their infant and 17 (8%) chose OPV. Of greatest concern to most parents was vaccine-associated paralytic polio (VAPP) (155, or 68.3%); the next greatest concern was an extra injection (22, or 9.7%). These parental concerns were unrelated to the number of injections the infant actually received.

Conclusions. After receiving information on polio vaccination options and a provider recommendation, parents overwhelmingly chose IPV over OPV. Concern about VAPP was more common than objection to an extra injection. The additional injection that results from using IPV for an infant's first poliovirus vaccination appears to be acceptable to most parents.

[a]National Immunization Program, Centers for Disease Control and Prevention, Atlanta, GA

[b]Cobb County Health Department, Cobb County, GA

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Address correspondence to: Maureen S. Kolasa, RN, MPH, 1600 Clifton Rd. NE, MS E-52, Atlanta, GA 30333; tel. 404-639-8759; fax 404-639-8616; e-mail <mkolasa@cdc.gov>.

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The routine use of the oral poliovirus vaccine (OPV) resulted in an average of eight to nine cases of vaccine-associated paralytic polio (VAPP) annually in the US between 1980 and 1996.[1] The severity of VAPP is similar to that of the wild poliovirus; it can occur among healthy vaccine recipients and healthy close contacts of vaccine recipients.[1] Cases have also been reported among persons with abnormalities of the immune system who either received OPV or had direct contact with an OPV recipient.[1] To decrease the occurrence of VAPP, in June, 1996, the Advisory Committee on Immunization Practices (ACIP) voted to recommend a sequential inactivated poliovirus vaccine (IPV)/OPV schedule.[1–3] To further decrease the risk of VAPP, in June 1999 ACIP recommended an all-IPV schedule.[4]

Although use of a sequential IPV-OPV or an all-IPV schedule instead of an all-OPV schedule decreases the risk of VAPP, it requires additional injections. The introduction of a schedule requiring additional injections for infants, especially at 2 and 4 months of age, raised concerns about possible decreases in immunization coverage levels.[5–7]

Previous research did not give a clear picture of parental attitudes and beliefs associated with their infants receiving multiple injections at the same visit. In one study, most parents reported that they would be uncomfortable with children receiving three injections at one visit, while another study found that most parents preferred that their child receive three injections at one visit rather than returning for an additional visit. Furthermore, most parents in the second study preferred that their child receive four injections at one visit than that the child be brought back for an additional visit.[8,9]

Understanding parental acceptance of vaccination for their infants is critical for the continued success of childhood immunization programs. To clarify parental acceptance of multiple simultaneous injections, we assessed parental attitudes, beliefs, and behaviors re-

lated to expanding the use of IPV and the resulting increase in the number of injections at the 2- and 4-month immunization visits.

METHODS

We conducted this study from July 15, 1996, to January 31, 1997, in all eight local public health clinics in Cobb and Douglas Counties, Georgia. Cobb and Douglas Counties are suburban counties of Atlanta, Georgia. Each of the public health clinics offers a variety of services, including well-child care and immunizations. On July 15, 1996, these clinics adopted the sequential IPV-OPV schedule as the preferred schedule for poliovirus vaccination for infants less than 6 months of age beginning their poliovirus vaccination series.

The eligible population consisted of parents of infants less than 6 months of age who received part or all of the first set of primary vaccinations during a visit to a Cobb or Douglas County public health clinic. Surveys were conducted at the conclusion of the clinic visit among a convenience sample of these parents. Availability of trained survey administrators determined which parents were approached for an interview.

During the immunization visit, parents, guardians, or other adults accompanying eligible infants received the vaccine information statements (VIS) for all routinely administered vaccines at the time they signed in for the vaccination visit. The polio VIS described the all-OPV, all-IPV, and sequential IPV-OPV vaccination schedules. After reading the VIS, parents had the option of selecting IPV as part of the sequential schedule recommended by the clinic, IPV as part of an all-IPV schedule, or OPV as part of the all-OPV schedule. Recommendations for administration of other vaccines (DTP-Hib, and hepatitis B) were not altered.

After the vaccination session, parents who consented to participate responded to a 29-item questionnaire administered by trained clinic staff. Parents were asked about the type of poliovirus vaccine they chose and their reasons for that choice. The interview also assessed parental knowledge of clinic recommendations regarding poliovirus vaccination, their understanding and attitudes about risks and benefits of IPV and OPV poliovirus vaccinations, the number of injections their infant received during the visit, and their attitudes and beliefs regarding additional injections and vaccine safety. The questionnaire took approximately 15 minutes to complete. Spanish questionnaires were used at the two largest clinics, which saw the majority of Spanish-speaking clients and where Spanish-speaking interviewers were available.

We used two methods to determine the number of eligible infants. Each clinic used an electronic database system to record all vaccinations administered to every child receiving care at the clinic. These data were considered the "gold standard" in determining the number of infants whose parents were eligible for participation in the questionnaire, and the number, type, and date of vaccinations that the infants received. In addition, the administrative staff at each clinic kept a log of all infants less than 6 months of age whose parents were offered the infant's first poliovirus vaccination. The log included data on the type of poliovirus vaccine the infant received and whether the parents were interviewed. If an interview was not conducted, staff recorded the reason the interview did not occur. Data analysis was conducted using SAS (version 6.03).

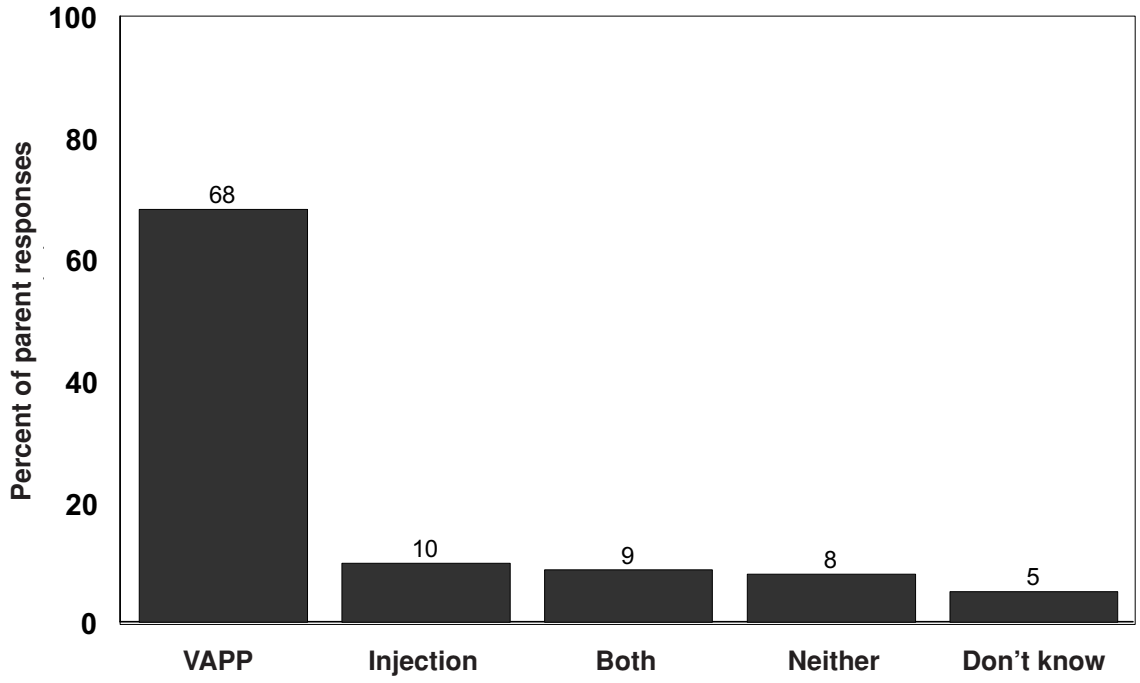
RESULTS

From July 15, 1996, through January 31, 1997, parents of 293 infants (out of around 405 eligible infants) were approached for an interview. Of these, 227 agreed to participate (77.5%). The primary reason for refusal to participate was lack of time to participate as stated by the parents. For seven parents (10% of those refusing), language barrier was noted as the reason for refusal.

Most respondents were the infant's mother (89.8%); 6.2% were the infant's father, and those remaining were other relatives. Among all infants, the median age for the first poliovirus vaccination was 2.3 months (range 1.5 to 5.9 months). Infant participants were 30.5% non-Hispanic white, 29.2% non-Hispanic black, 28.8% Hispanic, and 11.5% either Asian or of mixed race. The surveys were conducted in Spanish for 18% (41/227) of the interviews. The educational level reported for the mothers was evenly distributed among three categories: 34% (77/227) had some high school education, 34% (77/227) had graduated from high school, and the remaining 32% (73/227) had completed some post-secondary education. Most of those surveyed (76.6%) reported their child's immunization expenses were paid through Medicaid and 21.6% reported that they had no insurance. Only 0.9% had private insurance that paid for immunizations.

Among the 227 infants, 210 (92%) received IPV and 17 (8%) received OPV. Of the 17 children receiving OPV, 11 (68.8%) parents reported that they chose OPV because no extra shot was required. Other immunizations given when the first poliovirus immunization was given included DTP-Hib for 226 (99%) of the

Figure 1. Which of the two concerns is greater? The small chance of VAPP or the extra injection?



infants and hepatitis B for 116 (51.1%) of the infants. One injection was received by 3.5% of the children, two by 49.8% of the children, and three by 46.7% of the children.

Most parents (68.3%) reported being more concerned with the small chance of VAPP associated with OPV than with the extra injection needed to administer IPV. Only 9.7% reported being more concerned about extra injections. Another 8.8% thought both were of equal concern, 7.9% were not concerned with either, and 5.3% of parents stated that they didn't know (Figure 1). Most parents also expressed that, even though their children experienced pain from the shots, they were reassured that their child could not get polio disease from the vaccine.

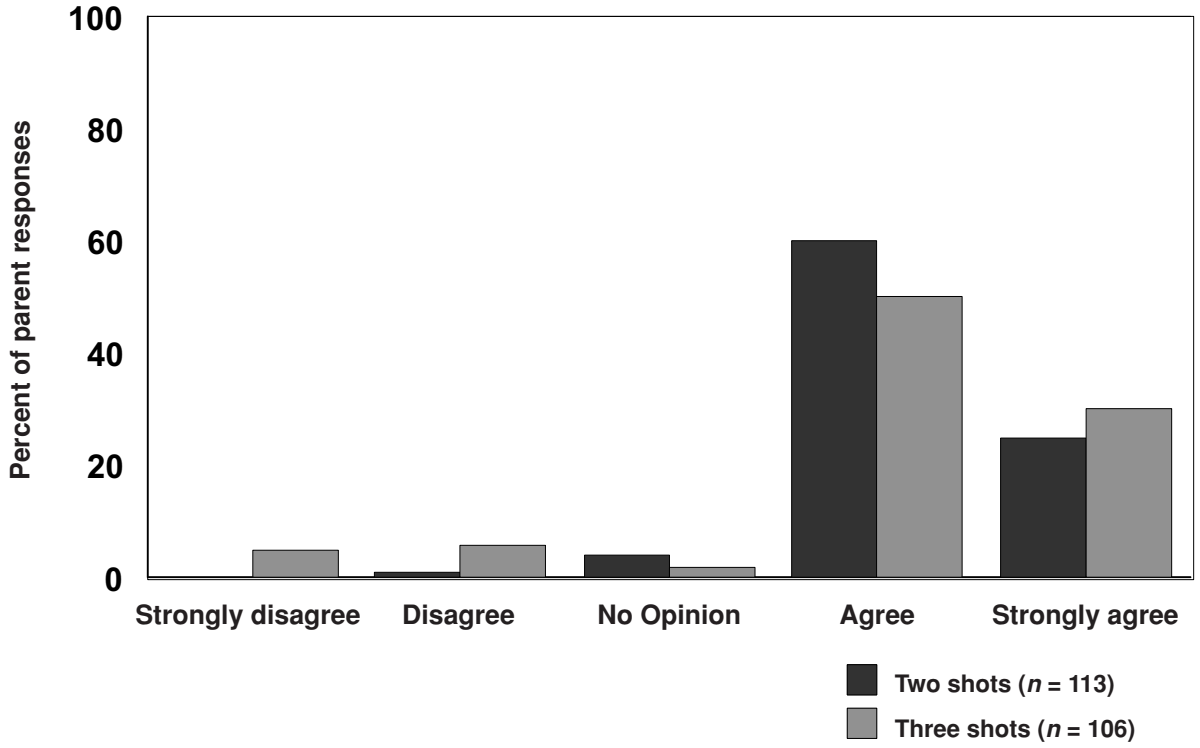
Parents whose children received two and three vaccination injections were asked how comfortable they felt with their child receiving that number of injections. Most of these parents (86%) agreed or strongly agreed that they were comfortable with that number of injections for their child (Figure 2). Most parents (99.1%) reported that they were satisfied with their child's immunization visit, and 95.6% reported that they planned to return to the same clinic for their child's next immunization visit. This finding was consistent across racial groups and maternal educational background. Parents were also asked a hypothetical question about their preference if four injections were due at one visit. Most parents (74.4%) indicated that they would prefer to come back for an additional visit rather than have four injections at one visit.

We also questioned parents about their understanding of the protection offered by the polio vaccines and the risks posed by the vaccines. IPV was considered to protect against polio disease by 91.6% of parents while OPV was considered protective by 70.5% of parents. When asked about the relationship of OPV and polio disease, 20.3% thought that OPV could not cause disease, 58.1% knew that it could result in VAPP, and 21.6% did not know. For IPV, 67.4% thought that IPV could not cause disease, 13.7% thought it could cause polio disease, and 18.9% did not know.

CONCLUSIONS

These data suggest an overall acceptance of IPV for the infant's first dose of poliovirus vaccine. Most of these parents, when faced with a provider recommen-

Figure 2. "I am comfortable that my child received two/three shots today."



dation, chose IPV for their infants. The added injection needed to administer IPV clearly did not deter these parents from accepting the vaccine. Parents also conveyed a positive perception of the visit, in spite of the extra injection associated with IPV. Most interviewed parents reported satisfaction with their infant's immunization visit and said that they planned to return to the same clinic for their infant's next immunization visit.

Most of the parents interviewed were comfortable with their children receiving two and three injections during one immunization visit. At the time of this study, DTaP was not yet licensed for infants, so all infants received a DTP-Hib combination vaccine. The greatest number of injections that a participating infant could have received at each visit was therefore three (IPV, DTP-Hib, hepatitis B).

In Madlon-Kay's study, most parents reported that, given a hypothetical situation, they would prefer to split visits rather than have their child receive three shots at one visit.[8] The actual behavior of parents participating in our survey, with 47.1% of the children receiving three injections at a single visit, differ from the response to Madlon-Kay's hypothetical situation. This finding is consistent with the studies conducted by Melman and colleagues, who found that the great majority of parents followed provider recommendations to have their child receive four and five injections per visit, although parents presented with a hypothetical situation reported preferring to split visits.[10,11] These findings suggest that, when asked hypothetical questions about how many shots they want their child to receive at each visit, parents underestimate the number of shots they are willing to have their child receive at one visit in the context of a provider recommen-dation.

The small risk of VAPP associated with OPV was an important issue with the parents in this survey. These parents expressed more concern about the potential for VAPP from OPV than about the number of injections infants receive at each visit.

The parents' concern with the small risk of disease from OPV has implications for policy and medical practice. The burden rests on health care providers to

discuss with parents the safety and possible adverse reactions associated with vaccines, particularly with poliovirus vaccines. In addition, health care practitioners need to ensure that their immunization policies reflect the importance of offering IPV. Furthermore, because parents in this survey preferred to have their child receive an extra injection rather than risk VAPP from OPV, immunization providers need to be prepared to administer an additional injection.

Overall, parents exhibited a generally low level of understanding of poliovirus vaccines and the risks posed by the different forms of vaccine. Questions about parental understanding were asked after the parents received the VIS, after parents were given verbal instructions by the staff about the vaccines, and after the child was vaccinated. These responses indicate that, even after being encouraged to read the VIS and after instruction by immunization providers, many parents still experience confusion about vaccine effectiveness and safety. Providers should be particularly aware of the need for careful explanations of vaccine options and risks, and be prepared to give a clear recommendation to parents on vaccines and vaccine schedules.[12–15]

One limitation to this study is that approximately 35 interviewers administered the surveys. The large number of interviewers resulted from the number of clinics surveyed, the extended hours that the clinics were open, and interviewer attrition over the six month survey period. To address this issue, multiple interviewer training sessions were conducted to familiarize interviewers with standardized interviewing techniques.[16] The generalizability of this study is another limitation. Because the characteristics of individual vaccines and parental perception of these characteristics differ, the generalizability of our findings to other injectable vaccines is unclear.

Although parents were not required to participate in the interview, most (77.5%) parents approached did agree to participate. The primary reason given for refusal to participate was parent's lack of time for the interview. The interview was administered after the immunization visit, and some parents already had lengthy waits prior to immunization administration. Because most parents approached did agree to participate, these findings can be considered representative of the clinics' populations. Furthermore, the participating clinics are typical public health clinics, and parents bringing their infants to these clinics likely are similar to parents bringing infants to other public health clinics. Parents who seek care at managed care or private provider offices may have different characteristics, and these results may not be generalizable to such parents. More studies, therefore, need to be done to evaluate parent's acceptance of IPV for their infants as well as the number of injections parents are willing to accept for their infants at one visit.

In summary, following a provider recommendation, the parents surveyed expressed overall acceptance of IPV as the first dose of poliovirus vaccine. They expressed more concern about the potential for VAPP from OPV than about the added injection associated with IPV. However, parents would prefer administration of fewer injections to their infants. This suggests that a combination vaccine containing age-appropriate vaccines would be more acceptable to parents. Combination vaccines would address both parental concerns about the risk of VAPP from OPV and the dislike of their infant receiving multiple injections at one visit.

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