FPG Snapshot

Parents' Decisions to Screen Their Newborn for Fragile X Syndrome

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FPG researchers investigate parent attitudes related to expanded newborn screening opportunities

STATE NEWBORN SCREENING (NBS) programs have expanded in recent years, and more tests may be added in the future. The expansion of neonatal screening raises ethical, legal, and social questions about:

- Screening for conditions for which there are no medical treatments;
- Labeling infants as "at-risk";
- Disclosing findings of uncertain medical significance; and
- Revealing carrier status or susceptibility to late-onset disorders.

The questions surrounding NBS for fragile X syndrome (FXS) typify these concerns. FXS is an X-linked genetic condition that is the most common inherited cause of intellectual disability. Approximately 1 in 4000 males and 1 in 6000 females have FXS. Carriers of the FX gene are much more common, with prevalence estimated at 1 in 290-800 males and 1 in 129–259 females. Because there is a persistently delayed age of diagnosis for FXS, early screening offers the possibility of more timely information and appropriate early intervention services. The lack of medical treatment options for children identified with the full mutation is a concern, however, as is the uncertain risk among carriers of subsequent developmental problems or adult-onset disorders. Bioethicists note that presymptomatic screening of infants also has the potential to result in excessive parental anxiety and hypervigilant parenting.

A Pilot Study

Recognizing that there has been little empirical investigation focused on the risks and benefits of expanded NBS, FPG researchers in collaboration with RTI International conducted a pilot study at the University of North Carolina Hospitals, which serve a socioeconomically and ethnically diverse patient population. Using a newly available and cost-effective screening test, the study offered voluntary NBS for both the fragile X full mutation and premutation. The study then examined parental consent rates, characteristics of parents who consented or declined, and parents' reasons for their decisions. Research staff recruited eligible families on the hospital's postpartum unit. Families considered whether to participate after receiving written and verbal information about the study, the test, the implications of a positive result, and follow-up procedures. For consented newborns, the study obtained an extra blood spot at the same time as the regular NBS. Parents received the screening results within 8 weeks, either by letter (if negative) or, if positive, by phone from a medical geneticist. Identified families were provided with genetic evaluation and counseling services.

Consent Rates

Over 14 months in 2009-2010, study staff approached more than 2000 mothers, nearly all of whom (96%) were willing to hear about the proposed screening. Of the families who learned about the study, slightly under two thirds (n=1288) consented to have their newborn screened. All but one acceptor and most decliners (83%) completed a brief demographic survey. Willingness to participate in screening generally increased with education; mothers with graduate degrees were more likely to agree than those with less than a high school diploma. On the other hand, African American families were about half as likely to agree to screening as either Hispanic/Latino or white families. This may be due to the legacy of mistrust resulting from past medical and genetic research in African American communities or to a different valuing of screening risks and benefits.

Reasons for Accepting

Parents gave three primary reasons for agreeing to participate in the study, with the most common one being "to know" (72%) so that they could monitor their child's health and development and plan ahead. The second reason, cited by almost a third of parents, was a belief in the importance of research. One mother commented, "You can't find cures for diseases without doing these things. It's your social responsibility." The third major reason, given by more than one-fourth of acceptors, was that the study was noninvasive and posed minimal or no risk to the child. Only 8 parents (less than 1%) viewed receiving "reproductive risk information" as a reason for accepting, suggesting that parents may focus more on implications for their newborn than on what positive screening results might mean for others.

Reasons for Declining

Many of the concerns expressed by decliners were similar to the concerns about expanded NBS that have been raised by bioethicists. In addition to noting that the timing or context for participating was not optimal (about 20%), decliners cited reasons such as not wanting to worry about the result (21%), not wanting to know (18%), or negative feelings about testing children or genetic testing in general (19%). In this last category, parents shared comments such as "The baby is tested for enough things already—too much testing can make one paranoid."

Discussion

Whether parents will consent to NBS for conditions not currently on state screening panels likely depends on the disorder and whether treatments exist. Acceptance may also be influenced by aspects of the consent process such as timing and content, and whether consent is oral or written, and opt in versus opt out. The 63% acceptance rate in this pilot study was somewhat lower than rates reported in research studies for other conditions and for other FXS pilot screening studies. This is not surprising, however, considering that the screening test detects a condition with no cure, discloses carrier status for which predictive information is equivocal, and is preceded by a rigorous consent process requiring both parents' consent within 24 hours postpartum. The fact that almost two-thirds of families nevertheless chose to participate indicates a higher level of parental support for fragile X screening than support from pediatricians or genetic counselors.

Obtaining truly informed consent for newborn fragile X screening poses the challenge of adequately explaining the potential consequences of having FXS or being a carrier. It is likely that some acceptors failed to understand that there is no cure or standard treatment for FXS, and some decliners did not wish to consider that something could be wrong with their newborn. For the most part, however, parents gave reasons for accepting or declining that suggest that they assessed the risks and benefits to some degree. Although the pilot project examined parents' decisions about fragile X screening, specifically, the study has broader relevance. Most of the outlined risks and benefits also apply to other genetic conditions that are potential candidates for inclusion on NBS panels. Moreover, recent animal studies and human clinical trials have identified promising treatments that ultimately may strengthen the rationale and need for NBS for FXS. In the meantime, the study's results provide a window onto the public's attitudes toward screening for conditions that are currently medically untreatable. ■

To Learn More

Skinner, D., Choudhury, S., Sideris, J., Guarda, S., Buansi, A., Roche, M., … Bailey, D. B., Jr. (2011). Parents' decisions to screen newborns for FMR1 gene expansions in a pilot research project. *Pediatrics, 127*, e1455-e1463.

For more information about the study, please visit: www.fpg.unc.edu/~fxnewborn