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Effects of Undergoing Multiplex Genetic Susceptibility Testing on Parent's Attitudes Towards Testing Their Children

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Abstract

Background—Parents may pursue common disease risk information about themselves via multiplex genetic susceptibility testing (MGST) for their children.

Purpose—To prospectively assess whether parents who received MGST disclosed their test results to their child, intended to change the child's health habits or have the child tested.

Methods—Eighty parents who opted for free MGST completed an online survey about a child in their household before undergoing MGST and a follow-up telephone survey three months after receiving results.

Results—Few parents (21%) disclosed results to the child. Undergoing MGST was unrelated to intentions to change the child's health habits but did increase parental willingness to test the child. Greater willingness to test a child was associated with positive attitudes toward pediatric genetic testing and intentions to change the child's health habits.

Conclusion—The experience of receiving MGST had little impact on parents' perceptions or behaviors related to their minor child.

Keywords

genetic predisposition to disease; genetic testing/psychology; health knowledge; attitudes; practice; parents; psychology

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INTRODUCTION

Multiplex genetic susceptibility testing (MGST), genetic testing for common variants that provides disease risk information, has been available through direct-to-consumer companies for approximately five years. While these tests are marketed to adults, direct-to-consumer advertising also cites the benefits of the information parents obtain about themselves for their children (e.g. www.23andMe.com). This may be interpreted by parents to suggest that MGST for common disease has implications for, and thus should be discussed with, children. Medical associations have been unanimous in urging caution in providing genetic testing to children for adult-onset disorders unless there is a medical or psychosocial benefit to the child [1,2]. Others have argued that because conditions such as diabetes and heart disease are preventable, the effects of awareness of genetic susceptibility should be studied to learn if it prompts early adoption of lifestyle and health behavior change [3].

To date, little is known about whether parenting behaviors are influenced by MGST for common disease that is based on variants associated with modest increases in risk. For example, it remains unclear whether the experience of considering and undergoing MGST for common disease would influence parents to discuss this information with their children, and whether receiving test results might prompt parents to have a child undergo testing or to encourage the child to adopt risk-reducing behavior changes. Previously, we reported that parents who were considering MGST for common disease were inclined to consider similar testing for their child and downplayed the potential risks of genetic testing [4]. The current report describes prospective assessments of parents who (as part of the Multiplex Initiative) visited a study website to consider MGST for common disease and ultimately decided to be tested [5].

The Risk Information Seeking and Processing Model [6] provided the conceptual background for understanding whether parents' experiences of considering and deciding to undergo MGST was associated with three outcomes: (1) their decisions to disclose their results to their child; (2) their willingness to have their child undergo MGST; and (3) their intentions to change their child's health habits. The Risk Information Seeking and Processing Model suggested considering the association of these outcomes with common precursors to information seeking including: risk perceptions, confidence to use the information, emotional reactions to testing, and attitudes towards seeking information.

METHODS

Participants

Participants in the current study were a subgroup of participants in the Multiplex Initiative who self-identified as parents. The Multiplex Initiative proactively recruited from a population-based sample of patients from the Henry Ford Health System in Detroit, Michigan. Identified individuals were surveyed by telephone between February 2007 and May 2008. Detailed methods of study recruitment are described elsewhere [7]. Briefly, a sampling frame of 6,348 healthy, young, insured adults aged 25–40 years was identified. To achieve adequate representation of groups historically underrepresented in genetic testing research, the following groups were oversampled: males, African Americans, and persons

living in neighborhoods with proportionately low education levels as indicated by the most recent U.S. census data [7]. Identified adults received an introductory letter in the mail followed by a telephone call, during which interested participants completed the baseline survey (Figure 1). Individuals who completed the baseline survey were mailed a study brochure and invited to review information on the study website about MGST for common disease (<https://multiplex.nih.gov/>). The Institutional Review Boards of the National Human Genome Research Institute and HFHS approved all aspects of this study.

Materials to Facilitate Decision Process for Adults Considering Multiplex Genetic Susceptibility Testing

The Multiplex Initiative website included four information modules, the comprising a consent process, that are described elsewhere [8]. The information included in the website modules used evidence-based communication approaches for conveying risk information [9,10]. The content of the website presented information for and against testing to assist the participant in making an informed testing decision [8]. The final module posed the following question: “Are you interested in genetic testing?” Participants who responded “yes” or “maybe” were contacted by a research educator to answer any additional questions and to schedule a clinic visit to provide a blood sample for deoxyribonucleic acid (DNA) extraction.

This MGST panel included 15 polymorphisms associated with eight common health conditions (colon, skin, and lung cancers; heart disease, osteoporosis; high blood pressure; high cholesterol; and type 2 diabetes). Similar to currently available direct-to-consumer multiplex tests, these polymorphisms are associated with modest increased risk to develop disease (e.g., 20–40% increased or decreased risk). Testing was performed at two independent laboratories (Johns Hopkins University and a private vendor) [11]. Approximately five months after the blood draw, participants received a packet of information via registered mail that contained their MGST results (Figure 1). Also included were supplementary one-page documents that described important caveats about the results, outlined behavioral strategies to reduce disease risk, and prepared the recipient for a telephone call from a research educator to discuss the MGST results within 10 days after mailing test results. Three months after receipt of results, these individuals were contacted to complete a follow-up survey that included many of the same items and measures as were administered at baseline.

Parent Recruitment

Parents who completed the final module of the website, regardless of their decision to test, were offered an additional \$20 incentive each to participate in an ancillary study. As part of the ancillary study, parents enumerated all of their children (biological, step, or otherwise) and provided each child’s birth month and year and gender. The website randomly selected a <18yo index child (if >1 child was present) who parents were asked to consider when completing the online ancillary baseline survey [12] which consisted of 46 closed-ended items.

Measures

Data presented here were collected at three time points: 1) baseline telephone survey; 2) online immediately after reviewing common disease MGST informational materials but prior to receipt of results; and, 3) by telephone three months after receipt of results (Figure 1).

Outcome Variables

At three months follow-up, parents were asked whether they had disclosed their test results to the index child (0 [no], 1 [yes]), followed by an open-ended prompt to ascertain the rationale for their decision (“In just a few sentences, please briefly explain your choice so that we may better understand your decision to tell or not tell your child about your genetic test results.”) No additional prompts were used to elicit a response to this query. Parents were also asked to rate their willingness to consider having the index child receive MGST for common disease (1 [not at all likely] to 7 [very likely]). Parents were asked whether they intended to change their child’s habits or lifestyle in the next six months to improve his/her health or prevent illness (0 [no]; 1 [yes, somewhat]; 2 [yes, definitely]).

Predictor Variables

Demographics and health status—Demographics of parents (age, gender, marital status, body mass index (BMI), health status) and index children (age and gender) were assessed at baseline. The number of risk variants identified in each parent was derived from the laboratory results.

Risk perceptions—Prior to testing, the *parent’s* perceived risk of developing the health condition (1 [not at all likely] to 7 [very likely]) was assessed individually for each of the eight health conditions. Online and prior to testing, parents’ perceptions of the index *child’s* lifetime risk of developing each of the 8 health conditions also was assessed (1 [not at all likely] to 7 [very likely]; 8 items, Cronbach’s $\alpha = 0.97$). An average score was calculated across the eight health conditions individually for parent’s own and child’s risk.

Confidence to use the information—Three months after receiving MGST results, parents rated their confidence in their ability to make changes in their *own* health habits in the next six months (1 [not at all confident] to 7 [very confident]).

Emotional reactions to test results—Three months after receiving MGST results, parents assessed: (1) emotional reactions to learning their test results (positive reactions [e.g., hopeful, determined], 3 items; negative reactions [e.g., nervous, afraid], 4 items; 1 [not at all] to 7 [a great deal]); and, (2) satisfaction with decision to receive MGST (5 items, 1 [strongly disagree] to 7 [strongly agree], dichotomized to highly satisfied ($M = 7$) vs. not highly satisfied ($M < 7$)). Parents were asked to anticipate their emotional responses to two hypothetical scenarios, learning that their child was: 1) at increased disease risk (positive reactions [e.g., relief] Cronbach’s $\alpha = 0.83$, 2 items; negative reactions [e.g., guilt, worry] Cronbach’s $\alpha = 0.79$, 5 items), and; 2) decreased disease risk (positive reactions Cronbach’s $\alpha = 0.96$, 2 items; negative reactions Cronbach’s $\alpha = 0.89$, 5 items) (1 [not at all likely] to 7 [very likely]).

Attitudes toward testing their child—Three months after receiving their MGST results, parents completed an 11-item modified version of the Pediatric Testing Attitudes Scale to assess their attitudes regarding MGST in children [13] (e.g., “Even though the common health conditions associated with these genes do not affect children until they reach adulthood, children should still be offered testing”; scored on a 5-point scale (1 [strongly disagree] to 5 [strongly agree], Cronbach’s $\alpha = 0.91$).

Analyses

Analyses were completed January – June 2012. Parents’ perceptions and attitudes were cross-tabulated by the three primary outcome variables. Significant associations were tested using Pearson product-moment correlations for continuous variables, chi-square tests on categorical variables, and Fisher’s exact tests on dichotomous variables. All bivariate analyses were adjusted for child’s age, gender and health status. Additionally, change scores were computed for measures that were assessed prior to and after MGST and examined for association with the three primary outcomes also adjusting for child’s age, gender, and health status. Responses to the open-ended question about parents’ rationale for disclosing/not disclosing their MGST results were recorded verbatim and coded by two raters with high inter-rater agreement obtained (Cohen’s $\kappa = 0.95$) [14].

RESULTS

Participants

As reported previously, of the 329 participants who logged on to the Multiplex Initiative secure website, 219 self-identified as parents and participated in the ancillary study [4]. Ninety-eight of these parents received MGST for common disease and 80 completed all three assessments. Parents who participated in the ancillary study, received MGST and responded to the follow up survey were more likely to be White, married and perceive themselves to be in excellent health than parents who only responded to the baseline ancillary survey. The demographic characteristics of the sample are shown in the Table.

Disclosure of parent’s test results to an index child

Only 17 (21%) parents reported disclosing their MGST for common disease result to their child. Child’s age was significantly and positively associated with parents’ disclosing test results ($p < 0.001$). Parents who disclosed MGST results were on average considering an older index child than parents who did not disclose MGST results ($M = 13$ ($SD = 3.78$) vs. 9 ($SD = 4.85$)). There was no difference in disclosure by child’s gender, health status or whether the child was adopted. Parents who disclosed results were more confident that they could make changes in their own health habits ($M = 6.25$ disclosed vs. 5.48 did not disclose; $p < 0.05$). There was no association between parents’ likelihood of disclosing their own test result with: perceived risk of developing the eight health conditions ($M = 3.13$ disclosed vs. 3.32 did not disclose; $p = 0.56$), perception of their child’s risk ($M = 3.26$ disclosed vs. 3.07 did not disclose; $p = 0.59$), having positive ($M = 3.88$ disclosed vs. $M = 4.03$ did not disclose; $p = 0.72$) or negative ($M = 1.72$ disclosed vs. $M = 1.85$ did not disclose; $p = 0.60$) emotional reactions to their own test results or their attitudes towards pediatric genetic testing ($M = 5.76$ disclosed vs. 5.08 did not disclose; $p = 0.08$).

Parents' rationale for common disease MGST disclosure decision

Parents' motives for disclosing results ($n = 17$) were a perceived sense of parental responsibility (sense of duty) to make the child aware of family health issues (70.6%), and to maintain trust and open communication (17.6%). Parents who did not disclose frequently reported the child to be too immature to understand the information (78.3%). Additionally in the absence of other health implications, parents did not consider the information compelling enough to warrant a discussion with the child (21.7%).

Parent's willingness to have the index child undergo testing?

Parents' baseline willingness to have the child tested was strongly and positively associated with their post-test willingness to have the child undergo MGST for common disease ($r = 0.53$, $p = 0.001$). However, parents who chose to undergo MGST ($n = 80$) increased in their willingness to have the index child undergo MGST (before testing, 5.05 (SD = 1.69) vs. after testing, 5.41 (SD = 1.99) on a 7-point scale; $p = 0.05$). Parents who reported high satisfaction with their decision to test were significantly more willing to have their child undergo MGST for common disease than those who did not report high satisfaction (5.89 vs. 4.29, $p = 0.001$). Parents' attitudes about pediatric genetic testing were also positively associated with their willingness to test their child ($r = 0.64$, $p < 0.001$).

While child gender was not associated at baseline (i.e., pre-test) with willingness to have the child undergo MGST for common disease, child gender was associated with parents' reported post-test willingness to consider MGST. Willingness to have the index child tested was significantly lower among parents of male vs. female children (4.93 (SD = 2.31) vs. 5.90 (SD = 1.48), $p < 0.01$).

Parent's perception of their own risk to develop the common health conditions on the MGST was not associated with post-testing willingness to have the child tested ($r = 0.20$; $p = 0.07$). However, parent's perception prior to testing that the *child* was at risk for developing the health conditions on the MGST was positively and significantly associated with their post-testing willingness to have the index child tested ($r = 0.32$; $p < 0.01$). Indeed, parents who were most willing to have the child undergo MGST also had greater odds of reporting intentions to make changes in their child's health habits (OR = 1.39 (95% CI: 1.04, 1.87); $p < 0.05$). There was no association of parents' confidence to make changes in health habits with willingness to test a child ($r = -0.17$).

Parents' emotional responses, both positive and negative, were not associated with their willingness to have their child tested. However, parents who anticipated a negative emotional reaction (e.g., fear) to learning that their child was at increased risk for a health condition were significantly less willing to have the child tested ($r = -0.25$, $p < 0.05$).

Parents' anticipated positive emotional reactions to learning their child had increased or decreased risk ($r = 0.07$ and 0.15 , respectively) or negative reactions to learning the child was at decreased risk ($r = 0.02$) were not associated with their willingness to have the child tested.

Intentions to change child's health habits

Undergoing MGST for common disease ($n = 80$) had no effect on parent's reported intentions to change the child's lifestyle or health behaviors (before testing, 2.0 (SD = 0.61) vs. after testing, 2.0 (SD = 0.84) range, 0 to 2). Emotional response, however, did influence parents' reported intentions. Parents' reports of generally positive emotional responses to their *own* test results were significantly and positively associated with (OR = 1.85 (95% CI: 1.26, 2.73), $p < 0.01$) their reported intention to make changes in their child's health habits. Parents who had more favorable attitudes towards pediatric genetic testing reported marginally greater intentions to change the child's health habits (OR = 1.37, (95% CI: 0.97, 1.95), $p < 0.06$). However, there was no association of parents' confidence to make changes in health habits or parent's anticipated emotional responses to their child's results with intention to change a child's health habits.

DISCUSSION

Our results provide a first glimpse into how parents' own experiences with MGST for common and preventable health conditions may influence their testing preferences for their children and other parenting behaviors. After undergoing MGST for common disease parents had moderate enthusiasm for having their child tested and this enthusiasm was not associated with the child's age. This may be explained in part by earlier findings showing that those in the Multiplex Initiative who opted for MGST were very favorable about the decision, and had a largely positive emotional response to their results [15,16]. Despite these positive appraisals, parents, particularly those of very young children, were not especially inclined to disclose their own test results to their child. The reasons parents gave for not disclosing suggested that parents did not perceive risk information with low probabilities to be compelling enough to tell a child, especially if they considered the child to be too immature to understand its implications.

Parent's willingness to have a child tested was strongly associated with their reported intentions to improve the child's health habits. Studies of adults have found limited evidence to support that genetic susceptibility testing prompts risk-reducing health behaviors [17,18]. In this study, parents reported behavioral intentions. Whether MGST for common disease prompts actual behavior change remains to be seen [17]. Parents' perceptions of their child's risk of developing common health conditions influenced their interest in having a child tested. Thus, health care providers approached by parents who are considering MGST may use the discussion as an opportunity to help parents identify specific changes they could make in their child's health behaviors to reduce risk, such as making healthier food choices and identifying opportunities to be physically active.

Our previous report suggested that parents may have a difficult time imagining the downsides of having a child undergo genetic susceptibility testing [4]. However, this report shows that those who *can* anticipate having negative emotional reactions to learning that their child is at increased risk for a health condition are less inclined to have the child tested. This is important because virtually all children who undergo MGST for common disease will have several genetic variants associated with modest increases in disease risk. Thus, future research is warranted to evaluate decision support tools for parents that help them

appreciate the possible pros and cons of genetic susceptibility testing their child for adult onset conditions and how parents could use the information to improve their child's health.

This manuscript is the first to give insights into how parents undergoing genetic susceptibility testing in a context similar to those offered via direct-to-consumer companies view similar testing for their children. However, the work has several limitations. The Multiplex Initiative did not educate parents about pediatric genetic testing; parents who visited the website viewed information only related to adult testing. In addition, testing was offered at no charge to the participant, which could limit the generalizability of these results to current direct-to-consumer contexts. Our results, which were based on MGST for eight common diseases, may not be similar to testing for other very large disease panels, whether common or rare, as participation was likely motivated by a variety of factors, such as family history and prevalence of disease. As the aim of the manuscript was descriptive, numerous associations were tested without adjustment for multiple comparisons. Finally, participants received incentives for completing online surveys and the offer of child testing was hypothetical as no children were actually tested in the Multiplex Initiative.

CONCLUSION

MGST for common disease as yet has undetermined clinical utility. Thus, efforts to engage parents, prior to testing, in articulating the pros and cons of the information and specifying how they would use the information to improve their child's health should be evaluated. More research should be devoted to optimizing clinical and public health approaches to educate and counsel parents about MGST for common disease, and to closely monitor the social, and behavioral outcomes of children and their parents who participate in such testing in clinical and direct-to-consumer settings.

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Works Cited

1. American Society of Human Genetics Board of Directors, American College of Medical Genetics Board of Directors. Points to consider: ethical, legal, and psychosocial implications of genetic testing in children and adolescents. *Am J Hum Genet.* Nov; 1995 57(5):1233–1241. [PubMed: 7485175]
2. Bioethics Co. Ethical Issues With Genetic Testing in Pediatrics. *Pediatrics.* Jun 1; 2001 107(6): 1451–1455. [PubMed: 11389275]

3. McBride CM, Guttmacher AE. Commentary: trailblazing a research agenda at the interface of pediatrics and genomic discovery--a commentary on the psychological aspects of genomics and child health. *J Pediatr Psychol.* Jul; 2009 34(6):662–664. [PubMed: 19129267]
4. Tercyak KP, Hensley Alford S, Emmons KM, Lipkus IM, Wilfond BS, McBride CM. Parents' attitudes toward pediatric genetic testing for common disease risk. *Pediatrics.* May; 2011 127(5):e1288–1295. [PubMed: 21502235]
5. McBride CM, Alford SH, Reid RJ, Larson EB, Baxeavanis AD, Brody LC. Characteristics of users of online personalized genomic risk assessments: implications for physician-patient interactions. *Genet Med.* Aug; 2009 11(8):582–587. [PubMed: 19606049]
6. Griffin RJ, Dunwoody S, Neuwirth K. Proposed model of the relationship of risk information seeking and processing to the development of preventive behaviors. *Environ Res.* Feb; 1999 80(2 Pt 2):S230–S245. [PubMed: 10092438]
7. Hensley Alford S, McBride CM, Reid RJ, Larson EB, Baxeavanis AD, Brody LC. Participation in genetic testing research varies by social group. *Public Health Genomi.* 2011; 14(2):85–93.
8. Kaphingst KA, McBride CM, Wade C, Alford SH, Brody LC, Baxeavanis AD. Consumers' use of web-based information and their decisions about multiplex genetic susceptibility testing. *J Med Internet Res.* 2010; 12(3):e41. [PubMed: 20884465]
9. Lipkus IM, Hollands JG. The visual communication of risk. *Journal of the National Cancer Institute. Monographs.* 1999; 25:149–163. [PubMed: 10854471]
10. Fagerlin A, Ubel PA, Smith DM, Zikmund-Fisher BJ. Making numbers matter: present and future research in risk communication. *American journal of health behavior.* Sep-Oct;2007 31 (Suppl 1):S47–56. [PubMed: 17931136]
11. Wade CH, McBride CM, Kardia SL, Brody LC. Considerations for designing a prototype genetic test for use in translational research. *Public Health Genomi.* 2010; 13(3):155–165.
12. Burrows KR, Kelley CK. Parental interrater reliability as a function of situational specificity and familiarity of target child. *J Abnorm Child Psychol.* Mar; 1983 11(1):41–47. [PubMed: 6853880]
13. Peshkin BN, DeMarco TA, Garber JE, et al. Brief assessment of parents' attitudes toward testing minor children for hereditary breast/ovarian cancer genes: development and validation of the Pediatric BRCA1/2 Testing Attitudes Scale (P-TAS). *J Pediatr Psychol.* Jul; 2009 34(6):627–638. [PubMed: 18385162]
14. Sharff ME, Demarco TA, Mays D, et al. Parenting Through Genetic Uncertainty: Themes in the Disclosure of Breast Cancer Risk Information to Children. *Genet Test Mol Biomarkers.* Nov 15.2011
15. Bloss CS, Schork NJ, Topol EJ. Effect of direct-to-consumer genomewide profiling to assess disease risk. *N Engl J Med.* Feb 10; 2011 364(6):524–534. [PubMed: 21226570]
16. Kaphingst KA, McBride CM, Wade C, et al. Patients' understanding of and responses to multiplex genetic susceptibility test results. *Genet Med.* Jul; 2012 14(7):681–687. [PubMed: 22481132]
17. McBride CM, Koehly LM, Sanderson SC, Kaphingst KA. The behavioral response to personalized genetic information: will genetic risk profiles motivate individuals and families to choose more healthful behaviors? *Annu Rev Public Health.* 2010; 31:89–103. [PubMed: 20070198]
18. Marteau TM, French DP, Griffin SJ, et al. Effects of communicating DNA-based disease risk estimates on risk-reducing behaviours. *Cochrane Database Syst Rev.* 2010; (10):CD007275. [PubMed: 20927756]

Figure 1.
Flow chart of Multiplex Initiative study procedures

Table 1

Comparison of participants who participated in ancillary study baseline and those who completed follow up

	Total eligible (N = 219)	Received MGST and participated in follow-up (N = 80)	P
<u>PARENT</u>			
Age, <i>m</i> (<i>SD</i>), y	35.24(3.63)	35.68(3.60)	0.181
Percent male (<i>n</i>)	49(108)	44(35)	0.211
Percent White (<i>n</i>)	45(99)	56(45)	0.032*
Percent married (<i>n</i>)	72(158)	81(65)	0.020*
Percent college educated (<i>n</i>)	42(91)	49(39)	0.101
Percent excellent perceived health (<i>n</i>)	22(49)	31(25)	0.018*
Percent BMI < 25 (<i>n</i>)	70(153)	63(50)	0.196
Percent high Internet access (<i>n</i>)	70(153)	76(61)	0.114
Total number of risk variants, <i>m</i> (<i>sd</i>)	9.49(1.74)	9.39(1.81)	0.221
<u>INDEX CHILD</u>			
Age, <i>m</i> (<i>SD</i>), y	9.85(4.90)	9.93(4.97)	0.863
Percent male (<i>n</i>)	48(106)	50(40)	0.720
Percent excellent perceived health (<i>n</i>)	49(108)	55(44)	0.134
Percent biological child (<i>n</i>)	88(193)	90(72)	0.511

* *P* < 0.05