Published in final edited form as:
J Empir Res Hum Res Ethics. 2011 December ; 6(4): 21–29. doi:10.1525/jer.2011.6.4.21.

Epilepsy Patient-Participants and Genetic Research Results as "Answers"

Emily E. Namey and **Laura M. Beskow**
Duke University

Abstract

Better understanding of how research participants with a known condition ascribe meaning to individual genetic results is important to help researchers and institutional review boards evaluate the potential benefits and harms of disclosing results in the context of genotype-driven research recruitment. Based on 29 in-depth interviews with epilepsy patients participating in a genetic study, we found that this population of research subjects anticipated that genetic research results would provide answers to a range of questions about the research process and their condition. Their multi-layered interpretations underscore the need for clear communication about the nature and limitations of results if individual or aggregate genetic results are returned in the process of recruitment for additional research.

Keywords

research recruitment; research participants; disclosure of research results; genetic research; research participants; genetic results

In 2010, Beskow and colleagues presented a case study of the ethical challenges in genotype-driven research recruitment (Beskow et al., 2010). Briefly, researchers at Duke University searching for gene variants associated with epilepsy found that some patients had large heterozygous deletions. To confirm causality and characterize phenotypic consequences, the researchers wanted to collect an additional biological sample from participants who had the deletion and recruit their family members into a follow-up study. As the study coordinator began recontacting eligible participants, she was confronted with the difficult task of explaining the purpose of the recruitment call, since the consent form for the original study had stated that individual research results would not be provided. She had come up against a major ethical challenge in genotype-driven research recruitment: Avoiding disclosure of potentially unwanted or uncertain genetic information while at the same time informing potential participants about the purpose of the research and participant eligibility criteria. In this context, ethical dilemmas surrounding the complex and much-debated issue of return of individual genetic research results (Bredenoord et al., 2011; Dressler, 2009) are shifted from the end of one research endeavor to the beginning, recruitment phase of another (Beskow et al., 2010).

Address correspondence to: Emily Namey, Duke Institute for Genome Sciences & Policy, 108 Seeley G Mudd, Box 3040, Durham, NC 27710. enamey@gmail.com.

In this case, the research team was initially split about how to address this difficulty. Some felt that participants should be given their results from the parent study, along with an explanation about their uncertainty, in order to avoid dissembling about the reason for recontact. Others felt that disclosing the results would provide no benefit and could cause undue anxiety and guilt among family members (Beskow et al., 2010, p. 706).

One approach to addressing the return of individual genetic results on either end of the research process is to assess relevant contextual factors of the study design and research population (Beskow & Burke, 2010). Both the vulnerability of research participants and their relationships with researchers have been identified as potentially important considerations when evaluating researcher obligations (Belsky & Richardson, 2004; Richardson & Belsky, 2004). Specifically, it is possible that researchers' obligations to *patient*-participants, those whose research participation is predicated on their having been diagnosed with the condition under study, may differ from obligations to research participants recruited as "healthy" controls.

With regard to individual genetic results, it has been suggested that investigators who plan to recruit participants with a known condition might consider offering results that inform participants' understanding of their illness, even when clinical utility has not been established (Beskow & Burke, 2010)—a lower threshold than is typically recommended for the return of results more broadly (Bookman et al., 2006; Fabsitz et al., 2010; NBAC, 1999). However, as expressed by the case study's research physician, there is also a corresponding concern that patient-participants may over-interpret what the results mean for their illness, particularly when little is otherwise known about the etiology of their condition.

Better understanding of how genetic research participants with a known condition ascribe meaning to individual genetic results may help researchers evaluate the potential benefits and harms of disclosing results in the context of research recruitment. Using qualitative data collected as part of a larger, multi-site study of genotype-driven research recruitment (Beskow et al., 2011), we examine the expectations of a sample of patient-participants from the above-described epilepsy study with regard to the meaning of individual genetic research results. Our goal is to inform context-sensitive assessments of the potential risks and benefits of offering individual genetic results when such results are the basis for further research recruitment.

Methods

Between February and October 2010, we conducted 29 semi-structured interviews with epilepsy patient-participants from a study entitled "The Genetics and Pharmacogenetics of Epilepsy" (hereafter referred to as "the epilepsy study") at Duke University Medical Center, in Durham, North Carolina. As described in more detail elsewhere (Beskow et al., 2010; Beskow et al., 2011), the research team for the epilepsy study recruited a subset of their participants for a genotype-driven follow-up study by sending all participants a letter summarizing aggregate findings from the original study and plans for a follow-up study, and then contacting those who had the genotype of interest to invite their participation in the follow-up study. As per the consent form for the original study, individual genetic research results were not provided.

Our qualitative research, part of a multi-site study (Beskow et al., 2011), focused on epilepsy study participants' experiences with and opinions about recontact for the purposes of research recruitment and return of results in the context of genotype-driven recruitment. To assemble our interview sample, the clinical research coordinator for the epilepsy study generated a list of participants that included all of those who were eligible for and had been

recontacted about the genotype-driven follow-up study (N = 26) and a sample of those who had received the letter describing aggregate results but were not eligible for the follow-up study. Because epilepsy can affect cognitive functioning, the clinical research coordinator and the research physician screened this list to identify participants who would be able to understand and reflect on our interview questions. The epilepsy study coordinator contacted these participants and described our study; for those who were interested in learning more, she obtained permission to give us their contact information. No epilepsy study participant who had opted out of future research contact was approached about this qualitative study.

We contacted interested participants directly to discuss our research and scheduled interviews with those who agreed to participate. One researcher (E.E.N.) conducted all of the interviews, in person when feasible and over the telephone when participants lived more than 60 miles from Duke. Participants provided verbal consent prior to the start of the interview, after reviewing a one-page study information sheet with the researcher. The 29 interviews were recorded and transcribed. As described in more detail elsewhere (Beskow et al., 2011), structural and content codes (Guest, MacQueen, & Namey, 2011) were developed and applied using NVivo software (NVivo 2008), 2010). For this analysis, we focused on data linked to content codes about preferences, benefits, and concerns related to individual genetic research results. On segments of the interview transcripts that featured any of these codes, we conducted a further round of coding to identify expressions of meaning and/or interpretation ascribed to genetic results.

Results

Participant Characteristics

Of the 26 epilepsy patient-participants eligible for the genotype-driven follow-up study, 18 were recommended for our qualitative study and were contacted by the epilepsy study coordinator; 11 agreed to learn more about our study and nine were interviewed. Among epilepsy patient-participants who were not eligible for the follow-up study, 24 were contacted and 20 completed an interview.

Most of our interviewees were female, white, non-Hispanic, and college educated (see Table 1). In general, this reflects the racial composition of the parent study sample, but includes more women and an average level of education higher than most of the epilepsy study patient-participants. About one-third of those in our sample had been recontacted about taking part in the genotype-driven follow-up study.

Preferences and Opinions about the Disclosure of Individual Genetic Research Results

Across the interviews and across different interview questions, most participants in our sample expressed a personal desire to receive individual results in the context of genotype-driven recruitment. In response to the question, “If you were/had been contacted about the follow-up study, would you have liked to know your individual genetic research results?”, 28 of 29 said “yes”. Opinions about whether researchers should generally offer individual results in the context of genotype-driven recruitment were also favorable. As one participant said, “I think it should be like public information for the individual…I consider genetics part of a condition, you know, part of a health condition, and you’re entitled to know that” (D18).

When asked more nuanced questions about whether researchers should offer individual results of uncertain validity or limited utility in the context of genotype-driven recruitment, there was a wider range of opinions among our sample. For example, interviewees were split almost equally on the question of whether results of uncertain meaning should be shared as part of a genotype-driven recruitment process. Those in favor often cited a participant’s need

to know why researchers were interested in *their* genetic sample specifically; those opposed to sharing results of uncertain meaning expressed concern about undue worry and anxiety: "If they're still in the 'might' stage then definitely it wouldn't do any good to the participant to know anything… I just don't think it's worth the risk [of stress] to the participant to divulge anything yet" (D01). When we elicited opinions on return of individual genetic results that were likely valid, but not clinically actionable, nearly three-quarters of participants in our sample again favored return of results. To investigate the underlying beliefs that informed participants' opinions on these issues, we looked more closely at how participants justified or explained their views.

Expectations and Interpretations of Individual Research Results as "Answers"

We reviewed the responses to our specific interview questions about return of results, as well as additional segments of the transcripts identified by specific content codes (see Methods above), to explore reasons for epilepsy patient-participants' positive and negative views about offering individual genetic research results in the context of recruitment for a follow-up study. In general, respondents' views on return of results seemed to be based on the assumption that individual genetic research results would give them answers to certain kinds of questions, as detailed below.

1. "Why do you want to study me more?"—About one-third of interviewees explicitly linked their opinions about provision of individual results in the context of recruitment to the need to answer the question "Why is this researcher recontacting me?" For some of these participants, receipt of individual results was considered necessary to informing their decisions about further research participation.

> I mean, if they're going to call me, wanting to talk to me again, I feel they need to explain why…. if it's something, like I said, special to my case, then yeah, I want to know why I'm coming out there and talking to people. (D09)

One person followed this line of reasoning further, suggesting that people might be disinclined to participate if they were not provided answers about why they were eligible:

> I don't think [participants would] want to participate in the second one if you don't let them know about the first one…. [If you offer results] I think you would have more legit results of whether a person wants to participate in this or not. (D22)

The provision (or withholding) of results as an explanation for recontact was also seen as an indicator of reciprocity in the research relationship. Expressions of reciprocity were particularly important in this context of genotype-driven recruitment, since researchers were contacting participants again to ask for something additional:

> It's important to know what they're doing, why they're doing it. They're not just coming around and giving you a test and saying, "Okay, filled out, see you later." No, you'd like to know that your time and effort is getting some kind of results. (D06)

Some of our interviewees focused on the need to receive individual genetic results to answer concerns about why investigators would want to do more research. For example,

> I would probably ask, "What did you find? And what tests would you do? And what are you lookin' for? And what are you tryin' to rule out?" So can you answer those questions? So that's the information you probably need to give them, I guess. (D28)

Several participants, however, seemed to assume that researchers would want to do more research specifically because they had found something wrong, and the anxieties raised by this kind of "answer" led them to take a more cautious view on return of results:

> I guess it depends on whether [the result is] bad or could be interpreted as bad. It's hard to say… you have to be careful about handing out information to people, especially genetic stuff 'cause these days it's like the hot topic and "Oh they know this about my DNA" and "What does it mean? What does it mean?" I think it's probably best to not say. (D16)

2. "What have you learned about my condition?"—For many of the patient-participants in our sample, opinions about return of individual research results were intertwined with their desire for answers about their epilepsy. Fifteen participants provided comments throughout the interview suggesting they would interpret genetic research results as knowledge about themselves and their disease. For example:

> When I think of [results with no current utility], I think my daddy was a diabetic and I think of the same things... we would want to know everything about the diabetes that we can know... And the same thing comes from epilepsy. I want to know what effects it may cause for me 20 years down the road, what may have happened 15 years ago that could have helped contribute for me to have epilepsy [so young]. So for any disease I think it would just, the more knowledge you have the better off you are. (D29)

The sentiment expressed here, that individual genetic research results constitute a kind of genetic self-knowledge and that knowledge is good, was echoed by many epilepsy patient-participants. In discussing the benefits of receiving individual research results in the context of research recruitment, the same participant explained further,

> I would still want to know [the results]. There may be a cure for epilepsy, there may not. There may be a treatment, there may not. But I want to know everything I can about epilepsy, good, bad and ugly. I just want to know everything about it. (D29)

The answers that research results were perceived to provide about patient-participants' epilepsy were important, regardless of any associated clinical action that might be taken.

However, despite their own positive assessment of return of results, some interviewees identified the potential for others to misinterpret the information as a concern. Their responses reflected an opposite interpretation of the "knowledge is good" meaning ascribed to individual results and cautioned instead that a little knowledge can be dangerous: "There's always the desire to self-diagnose and misdiagnose and come to your own conclusions, just by human nature. That's a negative" (D07).

In another, more specific, example of the interpretation of genetic results as answers about one's condition, participants in our sample hoped that genetic results returned in the context of research recruitment might answer the question, "Why do I have epilepsy?" Nearly half of all interviewees discussed the opportunity to learn the cause of their epilepsy as a reason for favoring return of individual results or a benefit of receipt of such results. For most, answering the "why" of their condition was vitally important, even if nothing could be done, and they believed individual genetic research results might provide these answers:

> …'Cause you know, I'd like to know the cause of why I have this problem anyway. Nobody in my family has ever had it. You know, why I had it to start with since I was six months old nobody knows. I mean the doctors never knew why I had it or any reason, so. (D14)

> …There are a lot of questions about why do I have epilepsy, why do the seizures occur? It would be helpful to know that there may be a trait. There may be something genetic that—I think that's valuable to me. I think some people would probably say no. But I think it would be. (D07)

Additionally, a few participants discussed their hope of finding an answer to why they have epilepsy as a motivation for joining the original epilepsy study, revealing preexisting expectations about what the study would tell them:

> [I joined] because … I didn't know how the seizures that I have now came about. I have no reason. My family background, they're not known for having seizures. (D27)

All of the participants who discussed individual research results as a source of answers about their condition were personally in favor of receiving individual genetic research results. Further, many of those who felt that genetic research results would contribute to self-knowledge had no concerns about researchers sharing such results with patient-participants because, in their minds, the worst—diagnosis and daily life with the condition—had already happened: "The damage is done. I mean, there's nothing really that's going to cause me concern" (D04).

3. "Can epilepsy be passed on in a family?"—The patient-participants in our sample anticipated that genetic research results would provide important information for their families, along with the answers for themselves. Comments about individual genetic results and heredity came most often in response to the question "What kind of information about your genes or DNA do you think would be beneficial to learn from researchers as a result of participating in the epilepsy study?" Interviewees provided examples of interpretations of genetic results as information that would answer the question of the heredity of epilepsy in two directions: one question was directed up the family tree to preceding generations, asking "Who gave this to me?", while the other was directed down to successive and future generations, asking "Could I pass / have passed this along to my kids?"

With regard to the former question, a few respondents specifically mentioned the possibility of tracing the familial source of their epilepsy as the reason they wanted individual results.

> It goes back to the whole question of where I got it, where it came from, what side of the family, or what side of the male or female [passed] it to me, and it's got a lot of questions that could be answered by [individual genetic research results]. (D26)

> I would like to know if it was because of another member of my family. And I would like to trace their history, to find out what caused— … I mean as far as back as my grandmothers, their side and things like that, no one had it. I was the only one and I wanted to know why. (D22)

Here again, the emphasis was on identifying the cause of one's epilepsy, but interpretations went beyond an answer to "Why do I have epilepsy?" to look for a specific carrier in a family. One participant mentioned concerns about the potential for family strife if recipients of results used the genetic information to explore the origins of their condition:

> …if it was a genetic form they could look back at "Who gave this to me, which person?" And it might cause a little conflict in a family trying to see, you know, which one they're going to point the finger at as, "It's because of you I've got this," or something. (D03)

More commonly, however, participants in our sample were interested in looking to the future, with about half expecting that genetic results would supply answers as to whether they might pass (or had passed) a genetic trait for epilepsy on to their children. Some were

concerned simply with knowing whether there was a possibility that epilepsy could be hereditary: “Yeah, that’s the main thing, whether or not my genes could pass it down to my boys or even skip and pass it down to their children” (D25). A few hinted at the benefit of receipt of results for reproductive decision making:

> I had one child, and [my neurologist said] “Don’t have any more children.” And that always left a question to me, you know, why I cannot have another child… I know with having the seizures I wouldn’t want to give it to anyone else, but I didn’t think that you could have a child with it… [Research results would let people] know if they should proceed with anything. (D22)

Others more clearly articulated the potential use of research results for surveillance of extant children and grandchildren.

> [I would want individual genetic results] just for the ease of mind, I mean because … then if it is genetic then that’s the possibility that it’s going to pass on to your kids if you have kids…. And so yes, then I would want to know... because then if my kid did start to have seizures young, then that’s something that I would look for in my child. And that would be something that I could change, yes. (D21)

> Well the biggest reason is my kids and when my kids have grandchildren, to see if there was anything that we could do different to keep them from having it. (D12)

As the first quote illustrates, research results were viewed as information that may have potential to assist in the early detection of epilepsy. As illustrated in the second quote, the perceived benefits of the information would confer not only to the participant, but to his or her children and grandchildren as well. In both cases, important actions followed from expectations of research results as answers about heredity. For the few who expressed concerns about receiving this kind of information, there was still a silver lining of potential action to be taken:

> Well, for what I just mentioned about children, if it passes on and stuff like that. That’s a concern now because I already have two kids. I wouldn’t be able to stop it now. But at least I would know as far as if something needed to be treated. (D05)

4. “Is there anything (more) I can do?”—In addition to the perceived ability to “do” something with knowledge about the heritability of epilepsy, interviewees expressed a range of expectations and assumptions about what other actions they might take on the basis of individual genetic research results. On one end of the spectrum, some participants viewed results simultaneously as beneficial or “useful” *and* not medically actionable. “[I would want results] just ’cause it’s interesting. Useful to know. I mean, there’s not a lot you can do with it, but it just would be nice to know” (D19). For these participants, the motivation for learning individual results was simply to garner additional knowledge about one’s personal genetic profile, despite recognition that there may be no current clinical use of the information.

On the other end of the spectrum, a few participants’ comments suggested they would assume that the disclosure of a research result would imply potential for clinical action, particularly for a “sick person”:

> Well, just because if they’re going to contact [you], then if you’re a sick person, if somebody who’s doing research and they find this out, then maybe [you] can take this to the doctor and he can work at it and be like “Hey, this is not supposed to be like this, it should be like this,” and maybe they can go back and fix it. Then they can see the problem right there, you know, that maybe the doctor did not see

> because it was something that he couldn't just do a little test and see…then it becomes a priority and it's really important. (D21)

A few went further in their assumptions about clinical utility by seeming to conflate research results and clinical testing. For example, one interviewee stated,

> I'm encouraged when I just get information about my bloodwork when I have blood taken and they let me know what my levels of certain genes are and stuff like that. And like white blood cells and all this…. (D03)

The range of expectations, then, stretched from "I can't do anything with this genetic result now," to "I could inform my family if it is hereditary and we could all plan accordingly," to "I could take the genetic research result to my doctor and have her see if we could apply it to my immediate clinical care." Interestingly, the idea that a genetic research result might have future clinical utility was seldom mentioned. One person stated that a benefit of receipt of results would be to know "whether there [are] other treatments on the horizon" (D18), but overall, there was little talk of genetic research results providing information on or hope for new treatments or a cure for epilepsy.

Discussion

Issues surrounding whether and when to offer individual genetic research results—within the broad context of genomic research and the narrower context of genotype-driven recruitment—will ultimately be informed by views from bioethicists, IRB leaders, researchers, clinicians, and research participants (who may also be patients). Others have reported opinions from the general population on the return of genetic research results (Beskow & Smolek, 2009; Kaufman et al., 2008; Murphy et al., 2008) that were predominantly favorable. Our findings differ in that they focused specifically on the context of genotype-driven recruitment in a population with a known condition who were asked about the prospect of receiving results from a study in which they actually participated. Our objective in this analysis was to describe some of the dominant themes within epilepsy patient-participants' discussions of returning research results in the context of genotype-driven recruitment, to explore the various expectations, meanings, and interpretations that participants with a known condition may bring to individual genetic results. Our sample of participants, all of whom were diagnosed with epilepsy, anticipated that individual genetic research results would provide answers to four important questions: (1) Why do you want to study me more? (2) What have you learned about my condition? (3) Can epilepsy be passed on in a family? and (4) Is there anything (more) I can do? Each of these four questions—and the assumptions that underpin views that genetic results provide "answers"—has important implications for the debate about return of research results. Together they help inform the context-based evaluation of potential benefits and harms associated with offering individual genetic research results to research participants already diagnosed with the condition under study.

As highlighted by the first question, many of our participants identified the context of genotype-driven research recruitment as the specific justification for disclosure of individual research results. They emphasized the importance of understanding *why* researchers were interested in them and the ability to make an informed decision about further participation. Interviewees noted that provision of results would likely increase willingness to participate in additional research, while withholding of results could have the opposite effect (Tabor et al., 2011, report similar findings). Return of results in the context of research recruitment was also seen as evidence that one's sample had been used, that research was progressing, and that there was reciprocity in the researcher/participant relationship. Despite these undeniably compelling reasons for disclosure, it is important to note that interviewees

expressed expectations and interpretations of what genetic research results might mean that were sometimes erroneous. For example, the results generated in the epilepsy study suggested a possible association between DNA deletions and seizures but did not provide answers as to the cause or heritability of epilepsy, as a large portion of our sample expected. Thus, unambiguous and careful communication about the limitations of any research results disclosed to participants would be essential during genotype-driven recruitment activities.

The second question, reflecting epilepsy patient-participants' search for more information about their condition and its causes, may derive from the nature of the condition itself. Defined "simply" as two or more unprovoked seizure events, epilepsy has many potential causes but, in most cases, the specific cause is unknown ("NINDS Epilepsy Information Page," 2011). Thus, many epilepsy patients and their families may have long been seeking an explanation for the condition. It is perhaps not surprising then that they would expect research results to provide these answers, raising concerns about the inclination to assign significant and potentially unwarranted meaning to any genetic research results returned.

Offering participants a lay-language summary of aggregate study findings could be a valuable way to let them know what researchers are learning about epilepsy and its causes, and to demonstrate reciprocity and gratitude for their contributions to the research. However, learning about aggregate results may raise questions in participants' minds about their individual results (Beskow et al., 2011); thus, provision of aggregate results from the first study may play a major role in informing prospective participants about the purpose of a genotype-driven follow-up study, but alone may not provide a complete solution to avoiding the disclosure of individual results with uncertain validity and utility.

The third question, about whether epilepsy can be passed on in families, suggests a strong interest in individual genetic research results as a source of answers about the heritability of epilepsy. Interviewees projected that research results would help them look both up and down the family tree for signs of epilepsy and extrapolated to what they might do with that information, including family planning, monitoring existing children or grandchildren, and notifying other family members for *their* use in reproductive decision making and surveillance of children. With regard to both the search for answers and the desire to take action on behalf of their families, the epilepsy patient-participants in our sample are similar to parents of children with autism in their views on individual genetic research results (see Tabor et al., 2011). This suggests that genetic research participants with a condition of unknown or uncertain origin may bring a set of expectations and assumptions to the research process that differs in important ways from not only "healthy" volunteers, but also from research participants who have a condition with known genetic etiology.

Finally, the question of whether there was anything more patient-participants could "do" based on receipt of individual results was answered by interviewees in a variety of ways, ranging from "no action" to having a physician look at and "fix" the problem gene. Interestingly, there was very little discussion about research results providing some clinical benefit or utility in the future, which may again reflect the current state of knowledge with regard to epilepsy. For example, where epilepsy patient-participants focused on finding answers about their condition and gave very little emphasis to the role of research results in providing hope for a new treatment or cure, discussion of new treatments was prominent among interviews with cystic fibrosis patient-participants, who have a known genetic disease (see Cadigan et al., 2011). Parents of children with autism also spoke of genetic results in terms of potential improvements for treatment (Tabor et al., 2011), perhaps indicative of differences in how adults conceptualize research for themselves and for their children, or a reflection of the momentum and advocacy for autism research. Thus, our findings emphasize the critical importance of evaluating approaches to return of individual

results to participant populations differently depending on disease status, the nature of the condition, and the current state of knowledge about the condition, with awareness of what the study population is predisposed to think results will and will not mean.

Best Practices

The multi-layered expectations about individual genetic research results presented here illustrate the need for clear, concise, and accurate communication if individual or aggregate genetic results are returned in the process of recruitment for additional research. This would include careful explanation of the nature and limitations of the research findings: what the results do and do not mean, what they can and cannot tell us, what researchers hope to learn with further study, as well as the incremental nature of research more generally and what can and cannot be expected from the results of any one study. These explanations should be tailored with awareness of the ways the target population might interpret or seek to use the results. For instance, many of our interviewees anticipated that individual genetic research results would, among other things, provide information about the source or cause of their epilepsy. With awareness of this potential for over-interpretation, a researcher could emphasize in communications with participants that “these results do not tell us what causes epilepsy” or “we do not yet know the role this gene plays in causing epilepsy.”

Identifying the assumptions or expectations that participants with a given condition may bring to genetic research will require some additional work at the beginning of a study, but will likely yield benefits for participants and researchers alike. There are a few avenues for identifying likely (mis)interpretations of genetic research results among a given population. A physician who regularly treats patients with the condition under study is a potential resource for evaluating the benefits and harms of offering genetic research results to those patient-participants. Disease- or condition-specific advocacy organizations may provide important background about the expectations participants have of genetic research. Also, a simple focus group of potential participants could be convened to elicit feedback and perceptions. Whatever the method, the goal is to identify condition-specific contextual factors that may affect considerations of the benefits and harms of returning individual or aggregate genetic results in the context of research recruitment.

Research Agenda

The relatively small, nonrandom nature of our sample, coupled with the specific focus on epilepsy patient-participants, limits the generalizability of our findings. However, focusing on what was distinctive about this study population was helpful in explicating what may be important contextual differences among various patient-participant populations in genetic research. Prospective research on participants’ experience of genotype-driven recruitment involving a larger, systematic sample of patient-participants may provide additional insights. Also, the participants in our study did not receive individual genetic research results as a part of their epilepsy study participation or genotype-driven recruitment. Future research on this topic could include studies where participants did receive individual genetic research results, to determine whether and how such disclosure changes patient-participants’ expectations and interpretations of genetic results.

Educational Implications

Learning more about the complex issues raised by genotype-driven recruitment would be beneficial for both researchers and IRB leaders. Developing a greater appreciation of the range of interpretations, preferences, expectations, and opinions that research participants bring to the matter would assist in creating and evaluating recruitment approaches that both protect research participants and help achieve important scientific goals.

Acknowledgments

This research was supported by Award Number RC1HG005787 from the National Human Genome Research Institute (NHGRI). The content is solely the responsibility of the authors and does not necessarily represent the official views of NHGRI or the National Institutes of Health.

We would like to thank Rod Radtke, David Goldstein, Kristen Linney, and Nicole Walley from the Duke epilepsy study for their collaboration on this project.

Biographies

Emily E. Namey was a coordinator of qualitative research at Duke University Medical Center in the Institute for Genome Sciences and Policy, the Department of Obstetrics and Gynecology, and the Trent Center for Bioethics during this project. She participated in the development of the interview guide, conducted all interviews at the Duke site, aided in the development of the codebook, led coding of the Duke interview data, and contributed to the analysis of cross-site data and to the manuscript content and revisions. She is now a research associate at FHI 360.

Laura M. Beskow is Assistant Research Professor at the Duke Institute for Genome Sciences and Policy, where her research focuses on ethics and policy issues in large-scale genomic research and translation. She is the Associate Director of the ethics core at the Duke Translational Medicine Institute, chairs the Informed Consent Task Force of the Consent and Community Consultation Workgroup for the Electronic Medical Records and Genomics Network, and is a member of the Subpart A Subcommittee of the Secretary's Advisory Committee for Human Research Protections. Dr. Beskow is the Principal Investigator of the present project; she conceived and led the design of the study, led the development of the interview guide, and oversaw data collection. She participated in coding the data and led the analysis and interpretation of the data. She drafted the manuscript, made critical revisions for important intellectual content, and approved the final version.

References

Belsky L, Richardson HS. Medical researchers' ancillary clinical care responsibilities. British Medical Journal. 2004; 328(7454):1494–1496. [PubMed: 15205296]

Beskow LM, Burke W. Offering individual genetic research results: Context matters. Science Translational Medicine. 2010; 2(38) 38cm20.

Beskow LM, Linney KN, Radtke RA, Heinzen EL, Goldstein DB. Ethical challenges in genotype-driven research recruitment. Genome Research. 2010; 20(6):705–709. [PubMed: 20418491]

Beskow LM, Namey EE, Cadigan RJ, Brazg T, Crouch J, Henderson GE, et al. Research participants' perspectives on genotype-driven research recruitment. Journal of Empirical Research on Human Research Ethics. 2011; 6(4):3–20. [PubMed: 22228056]

Beskow LM, Smolek SJ. Prospective biorepository participants' perspectives on access to research results. Journal of Empirical Research on Human Research Ethics. 2009; 4(3):99–111. [PubMed: 19754239]

Bookman EB, Langehorne AA, Eckfeldt JH, Glass KC, Jarvik GP, Klag M, Luepker RV. Reporting genetic results in research studies: Summary and recommendations of an NHLBI working group. American Journal of Medical Genetics A. 2006; 140(10):1033–1040.

Bredenoord AL, Kroes HY, Cuppen E, Parker M, van Delden JJ. Disclosure of individual genetic data to research participants: The debate reconsidered. Trends in Genetics. 2011; 27(2):41–47. [PubMed: 21190750]

Cadigan RJ, Michie M, Henderson G, Davis AM, Beskow LM. The meaning of genetic research results: Reflections from individuals with and without a known genetic disorder. Journal of Empirical Research on Human Research Ethics. 2011; 6(4):30–40. [PubMed: 22228058]

Dressler LG. Disclosure of research results from cancer genomic studies: State of the science. Clinical Cancer Research. 2009; 15(13):4270–4276. [PubMed: 19549775]

Fabsitz RR, McGuire A, Sharp RR, Puggal M, Beskow LM, Biesecker LG, Burke GL. Ethical and practical guidelines for reporting genetic research results to study participants: Updated guidelines from a National Heart, Lung, and Blood Institute working group. Circulation: Cardiovascular Genetics. 2010; 3(6):574–580. [PubMed: 21156933]

Guest, G.; MacQueen, KM.; Namey, E. Applied thematic analysis. Thousand Oaks, CA: Sage Publications; 2012.

Kaufman D, Murphy J, Scott J, Hudson K. Subjects matter: A survey of public opinions about a large genetic cohort study. Genetics in Medicine. 2008; 10(11):831–839. [PubMed: 19011407]

Murphy J, Scott J, Kaufman D, Geller G, LeRoy L, Hudson K. Public expectations for return of results from large-cohort genetic research. American Journal of Bioethics. 2008; 8(11):36–43. [PubMed: 19061108]

NBAC. Research involving human biological materials: Ethical issues and policy guidance. Vol. volume 1. Rockville, MD: U S Government Printing Office; 1999.

NINDS Epilepsy Information Page. [Retrieved June, 6 2011] National Institute of Neurological Disorders and Stroke. 2011. from http://www.ninds.nih.gov/disorders/epilepsy/epilepsy.htm

NVivo qualitative data analysis software. QSR International Pty Ltd. Version 8. 2008

NVivo qualitative data analysis software. QSR International Pty Ltd. Version 9. 2010

Richardson HS, Belsky L. The ancillary-care responsibilities of medical researchers: An ethical framework for thinking about the clinical care that researchers owe their subjects. Hastings Center Report. 2004; 34(1):25–33. [PubMed: 15098404]

Tabor HK, Brazg T, Crouch J, Namey EE, Fullerton SM, Beskow LM, Wilfond BS. Parent perspectives on pediatric genetic research and implications for genotype-driven research recruitment. Journal of Empirical Research on Human Research Ethics. 2011; 6(4):41–52. [PubMed: 22228059]

TABLE 1

Study Participant Characteristics.

	n	%*
Age: Mean = 44 years; Range = 22–67 years		
Education		
High school	10	34
Bachelor's degree	17	59
Graduate degree	2	7
Sex		
Female	21	72
Male	8	28
Race		
White	24	83
Black	5	17
Hispanic	1	3
Recontacted about follow-up study	9	31
Participated in follow-up study	7	24

* May not sum to 100% due to missing data.