

Psychosocial Implications of Uncertainty in Genomic Testing of Children with Autism

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INTRODUCTION

- Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by atypical development in social interaction, language and behavior.
- Chromosomal microarray analysis (CMA) is recommended as a first-tier diagnostic test for individuals with ASDs.
- CMA detects genomic variation of uncertain significance, leading to uncertainty the interpretation of test results
- CMA results can be:
 - (a) Positive or pathogenic: identification of a genetic alteration known to cause pathology
 - (b) Negative or normal: absence of a known pathogenic alteration
 - (c) Variant of unknown significance: a genetic alteration not previously described, not seen in controls, and for which there is incomplete data on the genes in the region.
 - VUS occurs in approximately 10% of individuals tested
 - Parental testing is recommended for VUS cases

OBJECTIVES

- Explore uncertainties in parents' experience with genomic testing of a child with ASD
- Describe psychosocial implications of uncertain results for parents, children and families

METHODS

Design

- Parents of children with ASD tested using CMA recruited through a hospital testing laboratory and a genetic testing facility
- Purposive sampling to recruit approximately equal numbers of families in each result category (Negative; Pathogenic; VUS).

Data collection

- Semi-structured telephone interviews
- This presentation focuses on the group with VUS results (N=20)

Analysis

Thematic content analysis of interview transcripts using Nvivo software

SAMPLE CHARACTERISTICS

	Attribute	n
Test Result	Variant	20
	Abnormal	18
	Normal	19
Parent Sex	Female	48
	Male	9
Child Sex	Female	11
	Male	46
Child Age	<=4	8
	5-12	35
	>= 13	14
Time since Test	<18months	18
	>= 18months	35
Racial Group	Asian	1
	Black or African American	2
	White	47
	More than 1 race	2
	Unknown or not reported	1
Ethnic Category	Latino or Hispanic	5
	Not Latino or Hispanic	52

THEMES IDENTIFIED

Positive implications

Acceptance of the condition

So now I'm actually able to accept the fact that it's – you know, his timeline may be a little bit different, but he's still, you know, whatever he does, I just want him to be the best at whatever it is.

Adjust expectations of the child

I was able to realize that this is a permanent part of his genetic makeup and something that we'll be dealing with over the long term, instead of trying to find a quick solution.

Access to information about child's condition

I read as much as I could about 16p12 syndrome. I found that there are associations for rare genetic disorders. I wanted to find out who the other kids were that had it, or people, it was all kids.

Negative implications

Increased concerns for the child tested

Just some of it was if he would have a specific syndrome or something and then from there we would find out a prognosis, fearful that, depending on what the outcome was, finding out that no kids with whatever syndrome lived passed the age of ten or – because at that point he was having a lot of medical issues. So it was like we wanted the answers but at the same time, if the answers were bad, we feared what they might be.

Increased concerns for family members

Well that got me a little nervous, because I have three children, so I thought, what if my middle child who never got diagnosed with any developmental disorder, what if she has that heart condition, what if she has the deletion and she has the heart condition, but we'll never know.

Blame and guilt

But then you're left with – from the genetic counseling perspective, you're left with, well, what does that say about you as a parent that you passed on this bad gene to your parents – your child, and then that makes you feel badly.

Uncertainty

• *There was a little relief that I saw something, but then of course the relief was taken away when told in later conversations ... like well, it doesn't really necessarily mean anything*

• *It's a little bit devastating in a way ... It's so cutting edge and so new, that I think we're just kind of on the edge of it where they're, well, we don't know what to do with this and we don't know for sure if it affects [child]*

Time Since Test

• **Negative implications** were reported by **more** parents who had received CMA results **more recently** (in the past 18 months), compared with those who had received results more than 18 months prior to the interview

• In contrast, **positive implications** were reported by **fewer** parents who had received CMA results **more recently** (in the past 18 months), compared with those who had received results more than 18 months prior to the interview

• **Uncertainty** was expressed **only** by parents who had received CMA results **more recently** (in the past 18 months), compared with those who had received results more than 18 months prior to the interview

CONCLUSIONS

- Families face challenges understanding CMA results due to uncertain findings and perceived lack of information about results
- Parents who received VUS results more recently tended to express more negative implications and uncertainty
- The expression of more negative implications and uncertainty among parents receiving results more recently suggests positive adaptation over time and a need for more support after results are received.
- VUS results can range from “probably benign” to “probably pathogenic” and parents' interpretations and responses can vary with different results.

PRACTICE IMPLICATIONS

- Healthcare providers should be aware of potential psychosocial issues raised by uncertain findings and address them a timely manner
- Families should be prepared for potential positive and negative psychosocial implications of uncertain test results.
- Concerns should be addressed before and soon after testing in order to reduce negative consequences.

FUTURE RESEARCH

- Evaluate strategies for peer support for families receiving VUS results.
- Improve communication between providers and parents in order to reduce negative implications of results.



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