FAVORABLE PSYCHOSOCIAL OUTCOMES IN HIGH OR MODERATE RISK MUTATION CARRIERS IDENTIFIED BY HEREDITARY CANCER PANEL TESTING

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Background

- Hereditary cancer panels can identify mutations in both high and moderate risk genes. Some providers feel that testing moderate risk genes may lead to patient confusion given limited understanding of penetrance and expressivity. Also, current screening guidelines for moderate risk mutation carriers rely heavily on expert opinion. (Easton D, et al)
- We tested the hypothesis that patients may report different psychosocial outcomes and perceptions following the receipt of genetic test results that identify high vs. moderate risk gene mutations

Methods

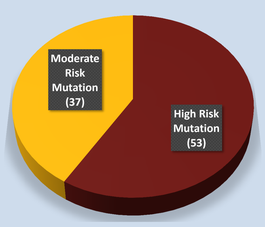
- We are conducting a multi-center, prospective cohort study of 2000 patients undergoing genetic counseling and hereditary cancer panel testing. The study will measure outcomes at multiple time points beginning 3 months after disclosure of genetic test results.
- Genes included on the panel: *APC, ATM, BARD1, BMPR1A, BRCA1, BRCA2, BRIP1, CDH1, CDK4, CDKN2A, CHEK2, EPCAM, MLH1, MSH2, MSH6, MUTYH, NBN, PALB2, PMS2, PTEN, RAD51C, RAD51D, SMAD4, STK11, and TP53.*
- We performed an unplanned interim analysis on 9/9/16. Of 1793 enrolled patients, 1430 had been sent a 3-month follow-up survey. The response rate was 59% (842/1430). Among the respondents, 11% (90/842) tested positive for a deleterious or suspected deleterious mutation. **These 90 mutation carriers are included in this analysis.**
- The Multidimensional Impact of Cancer Risk Assessment (MICRA) was administered on the 3-month follow up survey to measure distress, uncertainty, and positive experiences (0 Never, 1 Rarely, 3 Sometimes, 5 Often). (Cella D. et al)
- The 90 mutation carriers were divided into high risk and moderate risk mutation groups. Mean responses were compared between groups using t-tests.

Results

Table 1: Demographics of Patients with Mutations, N=90

Age (mean, SD)	50.8 (13.2)	
	n	%
Female	70	77.8
Race/Ethnicity		
Hispanic	40	44.4
White, non-Hispanic	36	40
Asian	10	11.1
Black	2	2.2
Other/Mixed	2	2.2
Affected by Cancer	66	73.3
Cancer Diagnoses in Patients (some with multiple primaries)		
Breast or DCIS	27	30.0
Colon or Rectum	18	20.0
Ovary	10	11.1
Melanoma	4	4.4
Uterus	5	5.6
Thyroid	5	5.6
Other	10	11.1
Education		
High School or Less	31	37.8
Some college/ vocational school	13	15.9
College degree	20	24.4
Graduate degree	18	22
English speaking	67	74.4
Have Children	69	76.7

Figure 1: Number of patients with a high or moderate risk mutation, N=90



- High risk group: 53 patients with a mutation in *APC, BRCA1, BRCA2, CDKN2A, MLH1, MSH2, MSH6, MUTYH (biallelic), PALB2,* or *PMS2*
- Moderate risk group: 37 patients with a mutation in *APC I1307K, ATM, BARD1, BRIP1, CHEK2, MUTYH (monoallelic), NBN, RAD51C*

Results

Figure 2: Understanding of Results and Recommendations

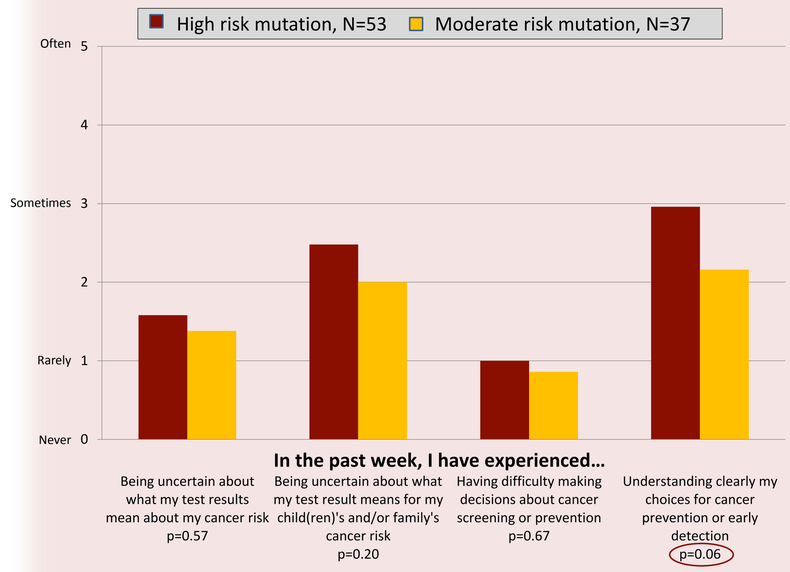


Figure 3: Positive Emotions After Genetic Test

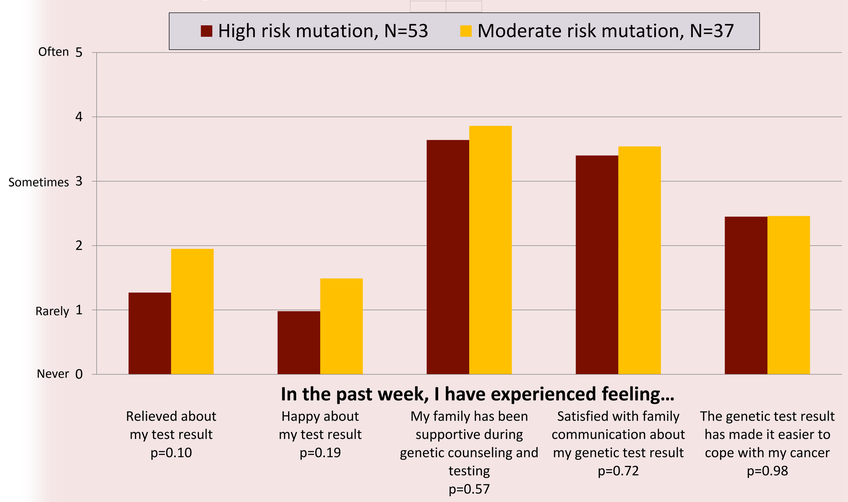
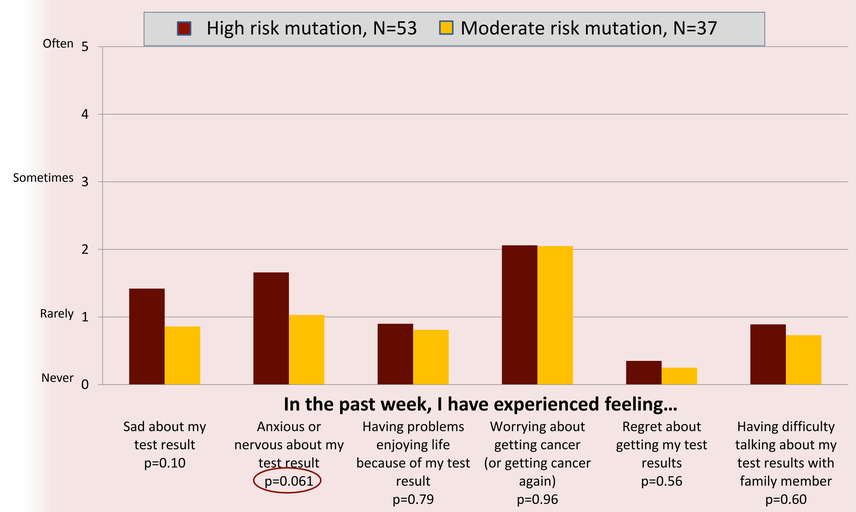


Figure 4: Negative Emotions After Genetic Test



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Results

Figure 5: Trust of Genetics Team

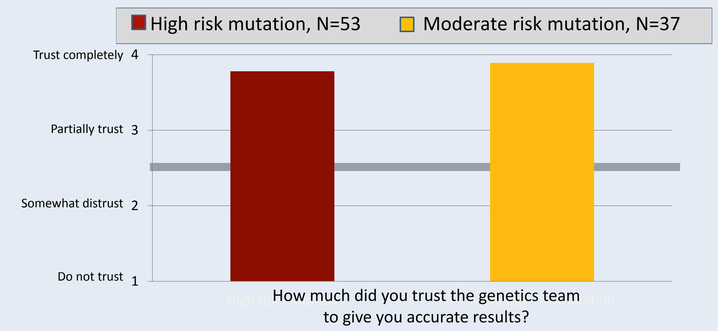
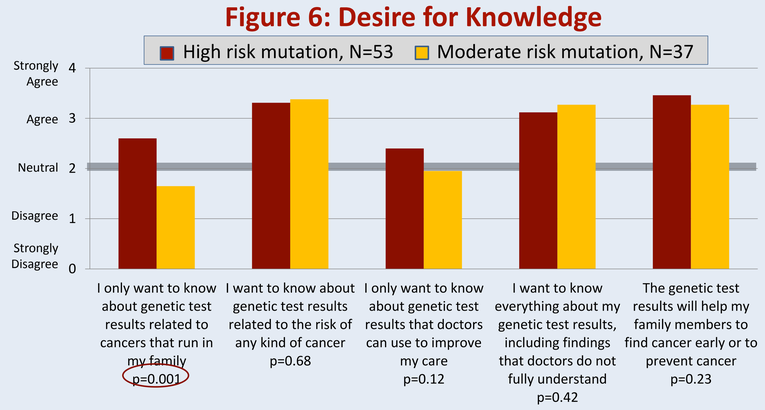


Figure 6: Desire for Knowledge



Results

- The study was comprised of a diverse population; 44% were Hispanic, 38% had a high school education or less, and 25% were non-English-speaking.
- Moderate risk mutation carriers did not have higher levels of uncertainty or more difficulty in making decisions than high risk mutation carriers.
- High risk carriers had a slightly higher level of understanding of their cancer prevention choices, but the difference was not statistically significant (p=0.062).
- Both groups rarely experienced negative feelings, such as sadness, anxiety, regret, or problems enjoying life.
- There was a very strong desire for information and very high level of trust of results in both groups.
- More individuals in the high risk group than the moderate risk group wanted to know about genetic test results related to only the cancer types in their family.

Conclusions

- Both moderate risk and high risk mutation carriers were generally coping favorably with their genetic test results at three months following results disclosure.
- Similar psychosocial effects are observed from receipt of moderate or high risk mutation results.
- This study was comprised of patients undergoing testing at cancer genetics clinics at academic hospitals. Further study is needed to compare impact of other testing delivery models on patient outcome.

References

- Easton D, et al, Gene-Panel Sequencing and the Prediction of Breast-Cancer Risk, N Engl J Med 2015; 372:2243-2257.
- Cella D, et al, A brief assessment of concerns associated with genetic testing for cancer: The multidimensional impact of cancer risk assessment (MICRA) questionnaire. Health Psychology 2002; 21:564-572.

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