5-1-2019

The relationship between uncertainty tolerance and oncologists' perceptions of large-panel genomic tumor testing

Eric Anderson
Maine Medical Center

Alexandra Hinton
Maine Medical Center

Christine Lary

Kimberly Murray
Maine Medical Center

Leo Waterson
Maine Medical Center

See next page for additional authors

Authors
Eric Anderson, Alexandra Hinton, Christine Lary, Kimberly Murray, Leo Waterson, Paul Han, and Maine Cancer Genomics Initiative

The relationship between uncertainty tolerance and oncologists' perceptions of large-panel genomic tumor testing

Eric Anderson[1], Alexandra Hinton[1], Christine Lary[1], Kimberly Murray[1], Leo Waterston[1], Paul Han[1]

Maine Cancer Genomics Initiative*

[1]Center for Outcomes Research and Evaluation, Maine Medical Center Research Institute

Introduction

Large-panel genomic tumor testing (GTT) is a new technology that promises to make cancer treatment more precise, but that currently poses many uncertainties regarding its clinical value and appropriate use. Uncertainty Tolerance (UT), a psychological construct that describes trait-level differences in individuals' responses to uncertainty, may influence oncologists' perceptions and attitudes regarding GTT.

Methods

Sample. 57 Community-based oncologists participating in a statewide study of large-panel GTT in routine oncology care completed surveys assessing their perceptions and attitudes regarding GTT.

Measures.

Perceived uncertainty about GTT (1-item): Genomic tumor testing seems uncertain

Attitudes about GTT (8-items, α = 0.67): GTT seems:
…beneficial
…harmful *
…accurate
…unproven *
…trustworthy, complicated, inefficient *, worthwhile
* reverse coded

Self-efficacy about GTT (4-items, α = 0.82): Confidence in:
…ability to interpret results
…ability to explain results
…ability to make appropriate treatment decisions
…your practice's ability to implement GTT

Uncertainty Tolerance (UT). Separate subscales assessed tolerance of 3 types of uncertainty: ambiguity, risk, and complexity

Ambiguity Tolerance (Han Ambiguity in Medicine Scale; Han et al., 2009)
I would not have confidence in a medical test or treatment if experts had conflicting opinions about it.
I would not be afraid of trying a medical test or treatment even if experts had conflicting opinions about it.
If experts had conflicting opinions about a medical test or treatment, I would still be willing to try it.

Risk Tolerance (Pearson Risk Attitude Scale; Pearson et al., 1995)
I try to avoid situations that have uncertain outcomes.
Taking risks does not bother me if the gains involved are high.
I rarely, if ever, take risks when there is another alternative.

Complexity Tolerance (Geller Tolerance for Ambiguity Scale; Geller et al., 1990)
If I am uncertain about the responsibilities involved in a particular task, I get very anxious.
I don't like to work on a problem unless there is a possibility of getting a clear-cut and unambiguous answer.
A good task is one in which what is to be done and how it is to be done are always clear.

Statistical Analysis. The relationship between perceived uncertainty and self-efficacy and attitudes regarding GTT was explored using GLMs. Oncologists' UT was assessed as a moderator.

Results

Sample Characteristics

Study sample (N = 57)

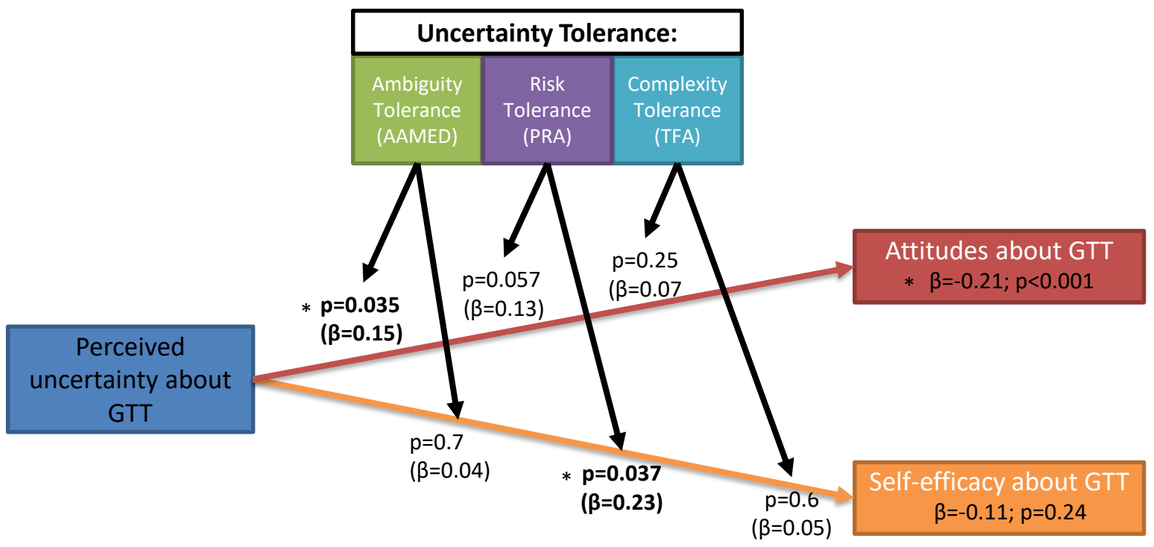
Gender	
Female	26 (46%)

Practice location	
Rural	17 (30%)
Small town	15 (26%)
Suburban	12 (21%)
Urban	9 (16%)

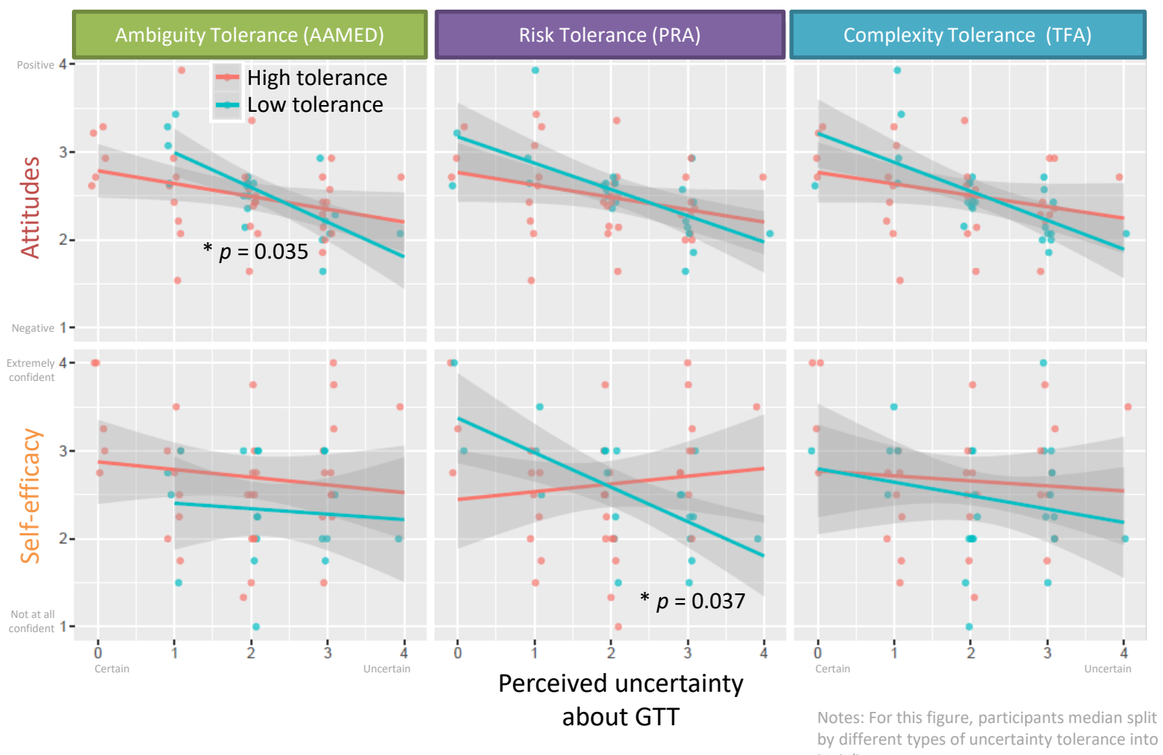
Years of Experience	
1-4	1 (1.9%)
5-9	7 (13%)
10-19	23 (43%)
20-29	13 (24%)
30+	10 (19%)

Specialty	
Hematology/Oncology	47 (84%)
Surgery	4 (7.1%)
Gynecology	2 (3.6%)
Urology	1 (1.8%)
Neurology	1 (1.8%)

Association between perceived uncertainty and attitudes and self-efficacy



Moderating effect of uncertainty tolerance



Notes: For this figure, participants median split by different types of uncertainty tolerance into high/low groups.

Conclusions

- Oncologists' perceived uncertainty about GTT is associated with their global attitudes towards GTT. Higher uncertainty is associated with more negative attitudes.
- Moreover, this relationship is moderated by individual differences in oncologists' uncertainty tolerance (UT). Greater UT buffers the relationship between uncertainty and negative attitudes. Furthermore, UT appears to have differential effects depending on the type of uncertainty (ambiguity, risk, complexity).
- More research is needed to understand the mechanisms by which UT influences perceptions, attitudes, and practices regarding GTT and other uncertain medical interventions.

References

Han, P. K. J., Reeve, B. B., Moser, R. P., & Klein, W. M. P. (2009). Aversion to ambiguity regarding medical tests and treatments: Measurement, prevalence, and relationship to sociodemographic factors. Journal of Health Communication, 14(6), 556–572.

Pearson, S. D., Goldman, L., Orav, E. J., Guadagnoli, E., Garcia, T. B., Johnson, P. A., & Lee, T. H. (1995). Triage decisions for emergency department patients with chest pain. Journal of General Internal Medicine, 10(10), 557–564.

Geller, G., Faden, R. R., & Levine, D. M. (1990). Tolerance for ambiguity among medical students: Implications for their selection, training and practice. Social Science and Medicine, 31(5), 619–624.

Eric Anderson: eanderson@mmc.org
* Jackson Laboratory MCGI leadership team: Jens Rueter, Andrey Antov, Ed Liu
The MCGI is supported by funding through the Alfond Foundation