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Title

COVID-19 case counts, individual immune function and pathogen avoidance motivation

Priority 1 (Research Category)

COVID-19

Presenters

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Abstract

Context: Research on the behavioral immune system finds that individuals are acutely attuned to, and motivated to avoid, cues of illness or infection in the environment. Researchers have just begun to examine how cognitive, affective, and behavioral disease avoidance mechanisms interact with the biological immune system. Data suggest that levels of certain immune markers change in response to disease cues. People with high pathogen avoidance motivation are both especially sensitive to disease cues and more likely to take steps to mitigate infection risk.

Objective: To explore connections amongst pathogen avoidance, immune function and infection case counts in light of the COVID-19 pandemic.

Study design/setting: Prospective, community based cohort study. The study explored relationships among individual differences in behavioral immune system activity (e.g., pathogen disgust), shifts in SARS-CoV-2 infection risk (i.e., 7-day case averages), and immune function.

Population studied: Community dwelling adults in McLennan County, Texas, US (n=387), July-November 2020. Healthcare workers and first responders were heavily represented(n=181).

Intervention: Multiple surveys regarding health behaviors, risk aversion and social stances were administered in addition to a single blood draw at the first of three study visits where vital signs were checked.

Outcome measures: Serum levels of immunological markers were evaluated against COVID-19 case counts. Bactericidal capacity of participants' serum was assessed via plating against *Escherichia coli*. Subject pathogen avoidance was evaluated.

Results: Levels of disease concern were not consistently associated with immune markers. COVID-19 case counts predicted changes in stress physiology in that serum markers (interferon, tumor necrosis factor, and some interleukins) varied by case counts. Serum killing ability of *Escherichia coli* also varied with Covid-19 case counts. Mediation models did not provide evidence that relationships between case

counts and immunological outcomes were mediated by stress levels. Healthcare workers and first responders differed from other participants in their immunological response to the pandemic.

Conclusions: This project provides evidence that immune function markers may be sensitive to changes in infection risk during the COVID-19 pandemic. This adds to the growing body of research finding relationships among behavioral and biological pathogen management mechanisms.