Inflammation And Cytokine Levels- Association With Suicide Attempt History Among Veterans

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OBJECTIVES

- To investigate and compare the longitudinal expression of cytokines (IL-1β, IL-4, IL-6, IFN-γ, and TNF-α) in **Veterans with current depression and a history of suicide attempts (MDD/SA)** versus **Veterans with no psychiatric diagnosis or suicide attempts (HC)**.
- To assess whether inflammatory markers could serve as potential biological indicators for identifying individuals at high-risk for suicide among Veterans.
- To explore the feasibility of using blood samples and inflammatory assays as a means of studying inflammation in the context of depression and suicide risk among Veterans.
- **Veterans with a history of suicide attempt have different cytokine levels than controls.**
  - Control: n=33
  - Experimental: n=38

BACKGROUND

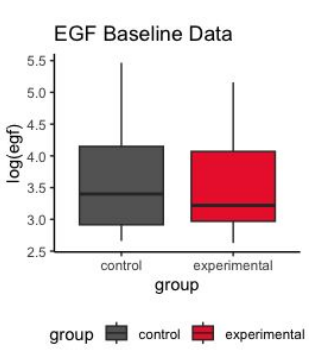
- In the US, suicide is the 12th leading cause of death, with a 30% increase in death rate from 2010 to 2020. Veterans, though a small portion of the population, account for nearly 15% of suicide deaths.
- Identifying high-risk individuals for suicide prevention remains challenging due to limited reliability of current psychosocial indicators. Emerging research explores biological markers, specifically cytokines, as potential contributors to suicide risk assessment and understanding suicidal behaviors.
- Inflammation, particularly cytokines IL-1β, IL-4, IL-6, IFN-γ, and TNF-α, is consistently associated with suicidal ideation and attempt history.

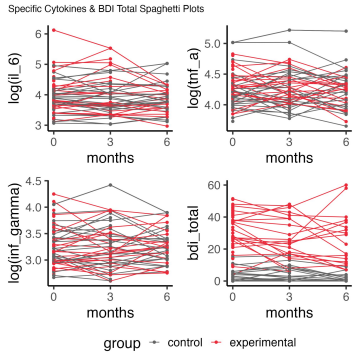
METHODS

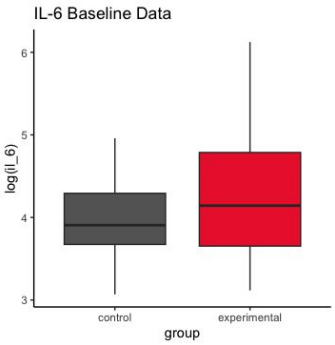
This longitudinal study involved US Veterans recruited from the JJPVA Medical Center in Bronx, New York.

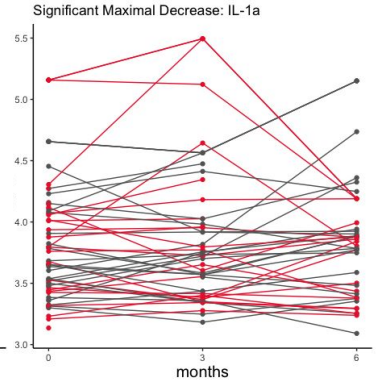
- Recruitment methods included IRB-approved flyers, local advertisements, physician referrals, and community outreach. Eligible participants were Veterans with any length of service in any US military branch, aged between 18 to 80 years, proficient in English, and capable of understanding informed consent procedures.
- Due to funding limitations, only the HC and MDD/SA groups were followed longitudinally at 0-, 3-, and 6-month intervals, totaling **71** individuals.
- Blood samples collected at initial timepoint (T0) and at 3 months and 6 months for the HC and MDD/SA groups.
- Conducted two-group comparison T-test (equal variance)
  - **H0:** There is **no difference** between veterans with a history of suicide attempt and controls.
  - **HA:** Veterans with a history of suicide attempt have **different** cytokine levels than controls.

DATA / STATISTICAL ANALYSIS









RESULTS/OUTCOMES

- Last observation carried forward (LOCF) did not yield any results.
  - Significant results observed in completer approach.
- IL-6 expression has a significant difference between the control and experimental groups at baseline (0 month) with a p-value of 0.047 and d.f. of 67 (2 patients removed).
- IL-1a expression has a significant minimal decrease between the control and experimental groups with a p-value of 0.041 and d.f. of 39 (28 patients removed).

CONCLUSIONS

- IL-6 and IL-1a are cytokines that exhibited a significant difference between the control and experimental groups.
- These results contribute to more targeted and effective suicide prevention interventions for veterans based on biological markers.
- Further research can be done to determine what these differences and associations are.
- Limitations include attrition, no standardization of blood draws, small sample of longitudinal data.

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