

Peritoneal Fluid Cytokine Levels in Patients Undergoing Damage Control Laparotomy Differ by Race



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Introduction

- The peritoneum plays a key role in the inflammatory response to abdominal injury.
- Cytokines are signaling proteins that help mediate inflammation, repair, and immune responses to injury.
- For trauma patients in extremis, the role of the peritoneum remains poorly studied. Outcomes for high-risk populations and the corresponding peritoneal environment are not well-studied.
- The objective of this study was to investigate the differences in peritoneal cytokine profiles between African American and white trauma patients undergoing damage control laparotomy.

Methods

- Peritoneal fluid samples were collected from adult trauma patients undergoing damage control laparotomy over a one-year period at a Level 1 trauma center.
- Samples were collected at the initial surgery and at take backs.
- Baseline demographic data was collected.
- Cytokine concentrations were measured using a 10-analyte multiplex assay. The cytokines were run in triplicates.
- Data was analyzed using the Mann-Whitney U test and Fischer's exact test.
- P-value < 0.05 was deemed significant.

Acknowledgements:

Clinical data for research was obtained from the Trauma Registry of University Medical Center New Orleans, Spirit of Charity Trauma Center.

Data & Results

Table 1: Summary of Demographic Data

	White <i>n</i> = 5	African American <i>n</i> = 15	P-value
Male (<i>n</i> , %)	4, 80.0%	13, 86.7%	1
Age (\bar{x} , <i>s</i>)	47.0, 9.0	31.3, 10.2	0.006*
BMI (\bar{x} , <i>s</i>)	30.1, 2.5	28.4, 6.2	0.55
EtOH Level (mg/dL) (\bar{x} , <i>s</i>)	62.4, 87.9	65.2, 95.9	0.95
Penetrating Trauma (<i>n</i> , %)	1, 20.0%	12, 80.0%	0.03*
Injury Severity Score (ISS) (\bar{x} , <i>s</i>)	27.0, 6.1	25.0, 15.0	0.66

Table 2: Summary of Cytokine Data

Cytokines (pg/mL) (\bar{x} , <i>s</i>)	White <i>n</i> = 5	African American <i>n</i> = 15	P-value
IFN-γ	1.3, 0.9	3.7, 4.7	0.98
IL-6	5651.1, 4703.9	8840.6, 4875.6	0.23
IL-1-β	13.2, 19.2	1078.9, 2026.2	0.01*
IL-8	3045.2, 3243.5	7722.9, 3868.3	0.07
IL-4	212.7, 464.4	99.9, 251.4	n/a
IL-17A	2.0, 1.7	17.2, 54.6	0.13
IL-10	383.5, 465.8	552.9, 615.0	0.31
FGF-2	723.5, 643.7	2026.2, 2093.4	0.23
MCP-1	4702.2, 3170.6	6453.6, 2991.3	0.35
VEGF	104.8, 81.0	552.7, 698.1	0.03*

* Denotes significant p-value < 0.05

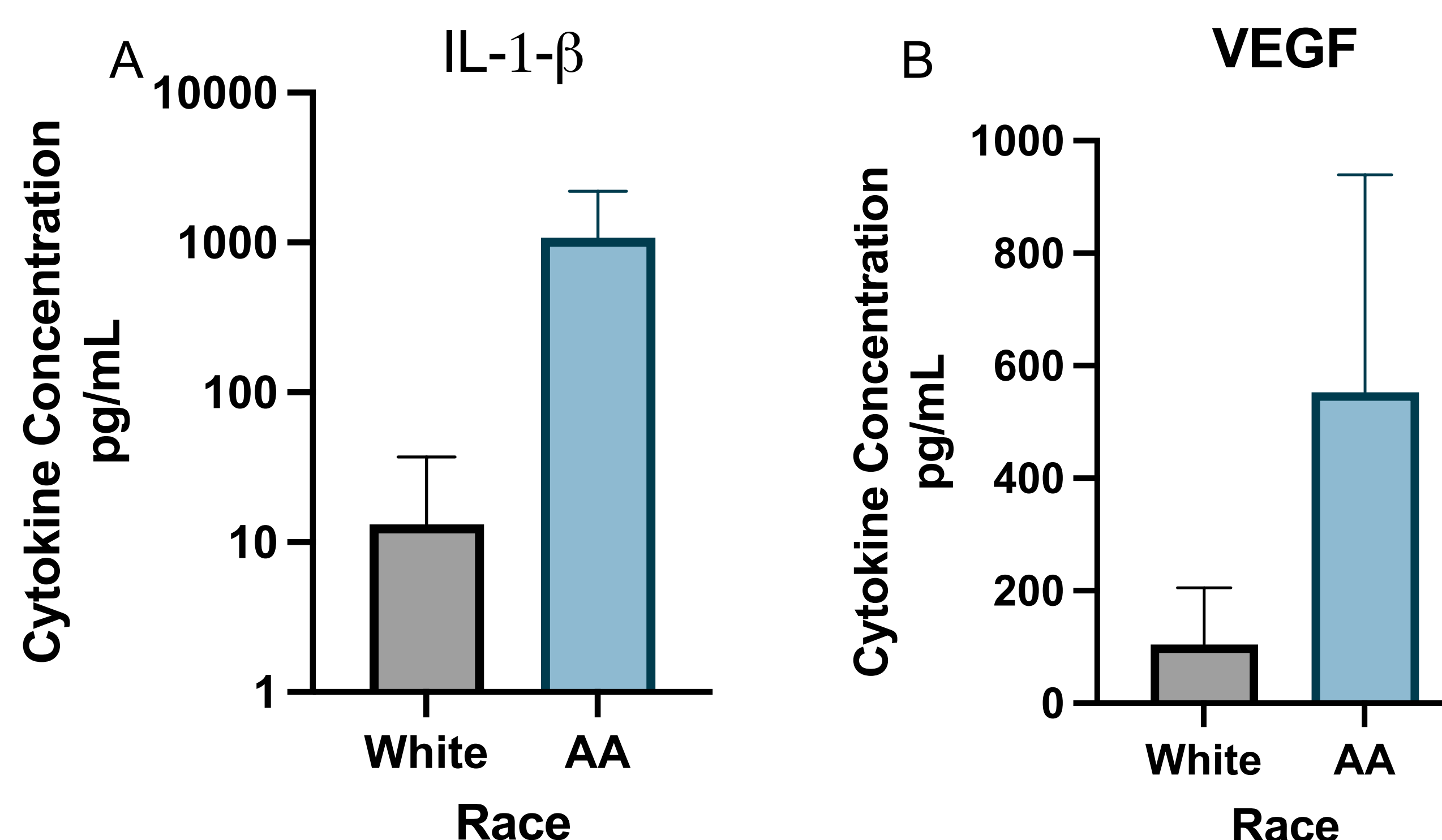


Figure 1: Mean and 95% CI of IL-1- β and VEGF between white and African American (AA) trauma patients.

Table 3: Summary of Clinical Outcomes

	White <i>n</i> = 5	African American <i>n</i> = 15
Survived (<i>n</i> , %)	4, 80.0%	14, 93.3%
Days in Hospital (\bar{x} , <i>s</i>)	27.2, 17.6	27.7, 19.2
Complications (<i>n</i> , %)	2, 40.0%	5, 33.3%

- African American patients were significantly younger than white patients ($p = 0.006$, Table 1).
- African American patients suffered from penetrating trauma significantly more than blunt trauma compared to white patients ($p = 0.03$, Table 1).
- Significant differences in the concentrations of IL-1- β ($p = 0.01$) and VEGF ($p = 0.03$) were found (Table 2, Figure 1).
- A p-value was not calculated for IL-4 due to undetectable results in more than 1/2 of the white trauma patient samples.

Conclusions

- African American trauma patients had significantly higher concentrations of IL-1- β and VEGF compared to white patients.
- This may suggest differences in inflammatory and repair responses, though the implications on clinical outcomes are still unclear.
- Further research should investigate the effect of age or trauma type on peritoneal cytokine variation.
- Future research efforts should also increase sample size and evaluate different populations.

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