Reduced Oxytocin and Elevated Vasopressin Marked Severe PTSD

A group of researchers compared basal levels of oxytocin (OT) and arginine vasopressin (AVP) in military veterans with posttraumatic stress disorder (PTSD) (a mental health condition triggered by experiencing or witnessing a traumatic event) to SWAT trainees and long-distance runners who had prior significant stress exposure.

Study

In the present study, PTSD participants were recruited by the Suicide and Trauma Reduction Initiative for Veterans (STRIVE) through referrals and social media. Eligible participants were 18 or older, had served in the United States (U.S.) military, and met PTSD diagnostic criteria Clinician-Administered PTSD Scale for DSM-5

(CAPS-5). Exclusion criteria included imminent suicide risk, substance use disorders, recent suicide attempts, or impaired mental status. PTSD participants volunteered for periodic blood draws during treatment, with the cohort being predominantly male (29 participants; 5 female).

Special Weapons and Tactics (SWAT) trainees (11 participants; 1 female) were recruited via emails and in-person appeals before a 2020 training exercise in Spanish Fork, Utah, and compensated for participation. Long-distance runners (RUNNERS) (21 participants; 8 female) were recruited through ultramarathon registrants in UT, Salt Lake City and compensated. All participants provided informed consent, and the cohorts were predominantly male.

PTSD participants attended 12 daily 1-hour cognitive processing therapy (CPT) sessions, an evidence-based treatment for PTSD. Of the 29 participants, 25 completed treatment. Blood draws were conducted at four time points during the two-week program.

Psychometric measures included the PTSD Checklist (PCL-5) and the Life Experiences Checklist (LEC-5). Baseline blood samples were collected, processed, and frozen for long-term storage. Plasma samples were analyzed for AVP, OT, and CORT using enzyme-linked immunosorbent assays (ELISA). Data were analyzed using R, with differences assessed by linear model analyses.

Findings

As expected based on their clinical diagnosis, the PTSD group exhibited significantly elevated PCL-5 scores compared to both groups of stressed-but-not-traumatized controls ($p<.001$). The majority of the PTSD group had PCL-5 scores above the clinical cutoff score of 30. Parallel analyses of trauma exposure history, assessed by the LEC, revealed significantly higher trauma exposure scores for both the SWAT and PTSD groups compared to the RUNNER control group

(p<0.01 and p<.001, respectively). There was no significant difference in lifetime trauma exposure between the PTSD and SWAT groups (p=0.74), highlighting the SWAT group's utility for comparisons of previous trauma exposure while isolating the effects of ongoing PTSD symptoms. None of the SWAT or RUNNER controls showed PCL-5 scores above the clinical cutoff, and PCL-5 scores did not differ significantly between the SWAT and RUNNER groups.

At baseline, PTSD patients had significantly lower plasma OT levels and significantly higher plasma AVP levels compared to both SWAT and RUNNER groups (p<0.001 for both hormones in both comparisons). These differences were substantial, exceeding two-fold for both OT and AVP. In contrast, CORT levels did not vary significantly across groups (p=0.183), with mean variations of 20% or less between groups. The AVP to OT ratio was particularly effective in distinguishing the PTSD group from the SWAT and RUNNER groups, showing virtually non-overlapping distributions. Similar results were found in analyses controlling for participant age and sex (OT: p<0.001; AVP: p<0.001; AVP:OT ratio: p<0.001; CORT: p=0.526).

The PTSD subjects reported generally positive emotional outcomes from the treatment protocol. There was a significant decline in PCL-5 scores over the course of therapy, indicating reduced PTSD symptoms. During the 14-day treatment protocol, participants showed a significant increase in OT levels (p=0.009), while AVP levels did not change significantly (p=0.248) and were markedly more variable than OT. The AVP/OT ratio declined significantly over the course of treatment (p=0.003). However, changes in plasma OT or AVP levels did not statistically correlate with the changes in reported PTSD symptoms.

Conclusion

To summarize, the study found significantly higher plasma AVP and lower plasma OT levels in PTSD patients compared to stressed but non-traumatized controls (SWAT trainees and long-distance runners). Plasma CORT levels showed no significant differences. These findings suggest the AVP/OT ratio as a specific indicator of PTSD, distinct from general stress. OT and AVP levels normalized during a 14-day behavioral therapy, correlating with reduced PTSD symptoms. The study highlights the potential of AVP/OT ratios as biomarkers for PTSD pathophysiology and treatment response, indicating that OT and AVP play critical roles in stress responses and resilience. However, the study's limitations, such as the small sample size and male-biased cohorts, should be considered. Future research should include more diverse and larger samples to confirm these findings.

Source:

https://www.news-medical.net/news/20240801/Severe-PTSD-characterized-by-lower-oxytocin-and-higher-vasopressin-levels.aspx