BRIEF REPORTS

Association of Intelligence With Severity of Posttraumatic Stress Disorder Symptoms in Vietnam Combat Veterans

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Objective: The purpose of this study was to determine whether intelligence predicts variance in posttraumatic stress disorder (PTSD) symptoms beyond that predicted by extent of combat exposure. Method: The subjects were 105 male Vietnam combat veterans. They completed the Mississippi Scale for Combat-Related Posttraumatic Stress Disorder, the Combat Exposure Scale, and the Shipley Institute for Living Scale, a measure of general intelligence. Number of years of education was recorded for each subject. Results: Multiple regression analyses revealed that estimated full-scale IQ significantly predicted variance in PTSD symptoms beyond that predicted by extent of combat exposure. The lower a subject's intelligence, the more severe were his PTSD symptoms. Conclusions: Cognitive variables may affect the ability to cope with trauma, thereby affecting whether a person develops chronic PTSD.
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Exposure to extremely threatening events is the chief predictor of posttraumatic stress disorder (PTSD) symptoms in Vietnam combat veterans (1, 2), and symptom severity increases as a function of exposure to atrocities (3), life threat (4), and grotesque death (4). Analyzing data from the National Vietnam Veterans Readjustment Study, Kulka et al. (2) found that combat exposure remained strongly related to PTSD symptoms even after the effects of socioeconomic status, race, age, and preservice mental health status were controlled for.

Combat did not produce chronic PTSD in most veterans. Accordingly, psychopathologists need to ascertain which individual-difference variables predict PTSD symptoms among veterans exposed to roughly equivalent levels of war-related stress. Indirect evidence suggests that intelligence may be one such variable. The investigators in the National Vietnam Veterans Readjustment Study found that veterans with low levels of premilitary educational achievement were at greater risk for developing PTSD than were other veterans (2). Similarly, Pitman et al. (5) found that low scores on a premilitary arithmetic aptitude test were associated with chronic PTSD. It is unknown, however, whether intelligence per se is related to symptom severity. Therefore, the purpose of the present study was to determine whether intelligence predicts variance in PTSD symptoms among Vietnam combat veterans beyond that predicted by extent of combat exposure.

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METHOD

The subjects were 105 male Vietnam combat veterans who had participated in memory studies that involved the administration of the measures described in the next paragraph (6, 7). The subjects provided written informed consent for participation in this research. Using the Structured Clinical Interview for DSM-III-R (8)—including the PTSD module (2)—a clinical psychologist had established current primary diagnoses of PTSD in 55 subjects, alcohol dependence or major depression in 17 subjects, and no diagnosis in 33 subjects.

The subjects completed the Mississippi Scale for Combat-Related Posttraumatic Stress Disorder (9), the Combat Exposure Scale (10), and the Shipley Institute for Living Scale (11). The Mississippi scale and the Combat Exposure Scale are widely used measures of PTSD symptoms and combat exposure, respectively. The Shipley scale is a brief, but reliable and valid, measure of general intelligence; the correlation (r) between the total score and full-scale IQ as measured by the WAIS-R (12) is 0.74. We also recorded number of years of education for each subject.

RESULTS

The subjects' mean score on the Mississippi Scale for Combat-Related Posttraumatic Stress Disorder was 104.6 (SD=30.4). Their mean score on the Combat Exposure Scale was 24.0 (SD=9.9). Their mean IQ was 103.1 (SD=14.1), and the mean number of years of education was 14.4 (SD=2.2). Zero-order correlations revealed that PTSD symptoms were related to extent of combat exposure (r=0.41, df=103, p=0.0001), to IQ (r=–0.33, df=103, p=0.0005), and to years of education (r=–0.32, df=103, p=0.001). The zero-order cor-

relation between IQ and years of education was significant (r=0.43, df=103, p=0.0001), whereas the correlation between IQ and combat exposure was not (r=–0.02, df=103, n.s.).

The zero-order correlation indicates that combat exposure predicts 17% (i.e., 0.41^2) of the variance in PTSD symptoms. To determine whether IQ predicts variance beyond that predicted by combat exposure, we performed a standard multiple regression with Mississippi scale score as the dependent variable and Combat Exposure Scale score and IQ as the independent variables. The R value for regression was significantly different from zero (F=18.94, df=2, 102, p=0.0001), and the R^2 value was 0.27 (adjusted R^2=0.26). Therefore, IQ predicted 10% more variance beyond that predicted by combat exposure alone (i.e., 27% versus 17%). This increment is significant (F=13.84, df=1, 101, p=0.01).

We next tested whether IQ predicts variance in PTSD symptoms beyond that predicted by combat exposure and years of education. The R value for regression was significantly different from zero (F=14.14, df=3, 101, p=0.0001), and the R^2 value was 0.30 (adjusted R^2= 0.28). Therefore, IQ predicted 3% more variance beyond that predicted by combat exposure and years of education (i.e., 30% versus 27%). This increment was significant (F=4.33, df=1, 101, p=0.05).

Partial correlation analyses revealed similar findings. Controlling for combat exposure, we obtained a significant partial correlation between Mississippi scale score and IQ (r=–0.35, df=102, p=0.001). Controlling for combat exposure and for years of education, we obtained a significant partial correlation between IQ and Mississippi scale score (–0.26, df=101, p=0.01). Controlling for combat exposure and for IQ, we obtained a nearly significant partial correlation between years of education and Mississippi scale score (r=–0.18, df=101, p=0.10). Thus, the correlation between IQ and PTSD symptoms remained significant when we partialed out the effects of combat exposure and years of education, but the correlation between years of education and PTSD symptoms was no longer significant when we partialed out the effects of combat exposure and IQ.

Because we did not have access to preservice IQs, it is difficult to determine whether current cognitive performance is an antecedent or consequence of PTSD. To clarify the causal relationship between cognitive ability and PTSD symptoms, we calculated the partial correlation between Mississippi scale score and years of education while controlling for combat exposure; the result was significant (r=–0.31, df=102, p=0.001). These findings suggest that some attribute (intelligence?) that contributes to both cognitive performance and educational achievement predicts variance in PTSD symptoms beyond that predicted by combat exposure alone.

DISCUSSION

The present study indicates that intelligence predicts variance in PTSD symptoms beyond that predicted by combat exposure. The lower a subject's intelligence, the more severe that subject's PTSD symptoms tended to be. Controlling for the effects of combat exposure did not diminish the correlation between PTSD symptoms and intelligence. Indeed, the zero-order and partial correlations were nearly identical, and the correlation between PTSD symptoms and IQ remained significant when the effects of educational achievement were partialed out as well.

Although IQ predicted variance in PTSD symptoms beyond that predicted by combat exposure and by years of education, it is debatable whether one should control for educational attainment when studying the predictive power of IQ. Because IQ strongly influences educational attainment, controlling for years of education can mask the true relation between cognitive ability and the dependent variable (e.g., PTSD symptoms).

These findings suggest that relatively high intelligence may protect against the development of chronic PTSD in combat veterans. Although combat may produce acute symptoms in many people, chronic PTSD may be least likely to develop in soldiers whose cognitive ability facilitates adaptive coping.

The present study has several limitations. First, our IQ measure did not predate military service, and so we cannot determine whether lower IQ resulted from PTSD symptoms or whether it was a risk factor for these symptoms. Nevertheless, because both educational achievement and IQ were similarly related to PTSD symptoms, it is more likely that cognitive disadvantage precedes chronic PTSD than that PTSD lowers intelligence. Second, we did not use a full WAIS-R battery. Third, the number of subjects was relatively small.

Bremner et al. (13) have suggested that chronically high levels of endogenous cortisol may produce cognitive deficits in veterans with PTSD. But Bremner et al. reported specific memory, not full-scale IQ, deficits. The implication of their findings for ours is unclear because the Shipley scale has no memory component.

In summary, although cognitive problems may result from PTSD, they may also function as risk factors for development of chronic PTSD. If cognitive disadvantage impairs coping, it may hamper recovery following exposure to trauma.

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