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## *COGNITIVE MEASURES OF VIETNAM-ERA PRISONERS OF WAR*

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## RESEARCH LETTERS

### Cognitive Measures of Vietnam-Era Prisoners of War

To the Editor: Although some studies have found decreased cognitive performance in repatriated prisoners of war (POWs),<sup>1,2</sup> other studies have not found such deficits.<sup>3,4</sup> Many of the studies that have found an intellectual decrement in POWs have methodological limitations, including failure to control for concurrent depression, posttraumatic stress disorder, or other mental illness; nonrandom selection of participants who were unmotivated to malingering; lack of a control group; and insufficient matching between POWs and controls.<sup>4</sup> In contrast, the largest investigation,<sup>3</sup> which studied more than 2500 World War II and Korean War POWs, noted that evidence of organic brain syndrome was "conspicuously absent" from the diagnoses differentiating POWs from controls. More recently, no cognitive differences were found on any cognitive test or on the computed axial tomography scans of POWs and controls.<sup>4</sup> We assessed the relative cognitive status of US Navy Vietnam-era POWs using data gathered by the Naval Operational Medicine Institute's ongoing POW research program.

**Methods.** Case subjects were 138 naval aviator POWs who were repatriated from North Vietnam in 1973. In 1976, the Navy invited 138 control subjects to participate in the annual examination program. The controls were matched for age, year of commission, job code, education level, marital status, rank, number of flight hours, type of aircraft flown, and specific months flying combat missions. Informed consent was obtained prior to participation.<sup>5</sup> During some years' annual examinations, cognitive assessment was also included.

Performance was compared between POWs and controls on 3 cognitive batteries: the Halstead-Reitan Neuropsychological Battery (HRNB), the Wechsler Adult Intelligence Scale (WAIS), and the CogScreen-Aeromedical Edition (AE). Although all POWs did not complete all 3 tests, each control was administered the same tests as his matched POW. The cases that had both matched-pair members with data on any of the 7 administrations of the 3 tests (117 matched pairs) were included in the study. Differences between groups and test sessions were assessed by multivariate analysis of variance. To assess whether POWs differed from controls on depression, the Minnesota Multiphasic Personality Inventory (MMPI) D score, which was obtained in the same testing session as the cognitive tests, was analyzed using an independent groups *t* test procedure. All analyses were conducted using SPSS v10.1.0 (SPSS Inc, Chicago, Ill).

**Results.** A comparison of the POWs and controls on 11 demographic variables revealed only 1 significant difference, with the control group having a mean of 0.4 more years of education (15.7 vs 16.1;  $P = .03$ ). The results of the MMPI D score analyses indicated the groups did not differ significantly on depression except for the subgroup that completed the CogScreen-AE. The POW group had a significantly higher D score (20.00 vs 17.67;  $P = .002$ ). There were no significant differences in baseline characteristics, however, between either POWs or controls who did or did not complete the CogScreen AE. However, both group means were well below the score differentiating clinical depression from normal variability.

Problems with colinearity, missing data, or inadequate sample sizes led to exclusion of 14 subtests of the HRNB. Multivariate results using the remaining 9 subtests indicated significant differences ( $P < .001$ ) between cases and controls, with controls having worse performance on 6 of the 9 subtests.

Analysis of WAIS data revealed a significant difference in average scores (129.9 vs 128.4;  $P = .048$ ) between POWs and controls, as well as significant differences between the test sessions for both groups but no interaction. In both digit-span and picture completion subtests, POWs performed better than controls. Univariate tests revealed significant between-session differences for arithmetic, vocabulary, picture completion, and block design, with performance improving over time.

Results of initial multivariate analysis of 64 CogScreen-AE subtests showed no significant between-group difference. A more detailed presentation of these results is available.<sup>6</sup>

**Comment.** The few statistically significant differences between repatriated POWs and controls showed better intellectual functioning in the POWs. The failure to find a significant decrement in POWs was likely not due to lack of statistical power. Although it is possible that the sample size had insufficient power to detect real differences between groups, the very small observed differences suggest that such an effect would not be of a large magnitude. The direction of the means suggested that the POWs may have slightly better intellectual performance than their matched controls.

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# REPORT DOCUMENTATION PAGE

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13. SUPPLEMENTARY NOTES					
14. ABSTRACT (maximum 200 words)  Experience as a prisoner of war (POW) could lead to cognitive impairment because of the injuries, including head trauma, and other stressors endured preceding and during capture, and during incarceration. Some research has reported decreased cognitive performance in repatriated POWs (RPOWs), while other research has found no cognitive impairment. The objective of this research is to assess the relative cognitive status of U.S. Navy Vietnam-era RPOWs using extant data from the Naval Operational Medicine Institute. Performance on 3 cognitive batteries was compared between RPOWs and a control group. These batteries were the Halstead-Reitan Neuropsychological Battery (HRNB), the Wechsler Adult Intelligence Scale (WAIS), and the CogScreen-Aeromedical Edition (AE). The HRNB and WAIS were each administered 3 times across 20 years, and the CogScreen-AE was administered once. The few significant differences between the cognitive performance of RPOWs and their matched controls did not indicate evidence of performance decrement for RPOWs on any cognitive measure. Results suggest that this group of RPOWs did not experience cognitive impairment as a result of their experience as POWs.					
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