

Participants and Methods: The current study is an analysis of data from a national bio/data-repository (Boston Biorepository Recruitment and Integrative Network for Gulf War Illness; BBRAIN) which includes key data samples from prior GW studies that have been merged and combined into retrospective datasets. Data include general health and chronic symptom questionnaires, demographics, deployment and self-reported exposure histories (separated into no exposure, fewer than 7 days exposure and greater than or equal to 7 days exposure), as well as key neuropsychological test variables. Three separate datasets were combined to include 62 women. Exposures to chemical alarms, oil well fires, pesticide cream or spray, pesticide fogging, and PB pills were self-reported. Linear regression models were produced for each continuous cognitive outcome, modeled on a given exposure, and controlling for age, education level, PTSD, and other exposures.

Results: Of the 62 women, the majority were White (77%). 74% of women surveyed were employed and 55% were married. 63% of women had at least a high school education. Deployed women who had > 7 days of exposure to pesticide sprays, CBW, smoke from oil well fires, and PB pills were more likely to show deficits in the areas of verbal learning and short-term memory ($p < .03$) and those with exposure to CBW, smoke from oil well fires, pesticides creams and PB pills had more errors on a test of executive functioning ($p < .01$). These data differ from the findings from cohorts of men.

Conclusions: These data validate the findings of our prior studies and add credence to the need for separate analyses for men and women. The unique outcomes may lead to individualized treatments for women veterans that may also help women with similar exposures from other deployments in addition to women with occupational exposures.

Categories: Drug/Toxin-Related Disorders (including Alcohol)

Keyword 1: neurotoxicity

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3 The Menopause Transition in Women with Traumatic Brain Injury

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Objective: All premenopausal women who survive traumatic brain injury (TBI) will eventually experience menopause. Challenges experienced by women with TBI are superimposed on challenges associated with hormonal changes in midlife. Some women with stressful life contexts such as TBI are more vulnerable to the added burdens of the menopause transition, potentiating its effects. Although it may be argued that TBI research correctly overrepresents the male experience given disparities in injury rates (4:1), there are important differences in how females and males age, their specific health needs, and the psychosocial context of midlife. Development of evidence-based interventions begins with understanding the experience of menopause after TBI, including where and when key problems may emerge.

Participants and Methods: All participants were women 40-60 years old, not taking hormones (i.e., replacement therapy or other systematic hormones), with intact ovaries. Women with TBI were > 2 years post injury, whose menstrual period returned after injury, and were living in the community. Severity of injury ranged from complicated-mild to severe TBI. Pre/peri and postmenopausal status was determined by presence/absence of menstrual period in previous 6 months, respectively. Eighteen common menopause symptoms (vasomotor, somatic, psychological, and cognitive) were assessed for presence and frequency (rarely-always), along with Quality of Life in Neurological Disorders (Neuro-QOL) Sleep Disturbance and Traumatic Brain Injury

Quality of Life (TBIQOL) Anxiety, Depression, and Fatigue scales.

Results: Overall, women with TBI (n = 68) showed greater presence and frequency of symptoms than women without TBI (n = 153), with fewer within-group differences by menopausal status. Among pre/peri-menopausal women, TBI and non-TBI groups did not significantly differ and showed small effect sizes on symptoms associated with changes in estrogen during menopause, including hot flashes, night sweats, bowel and bladder sequelae, and breast tenderness. However, pre/peri-menopausal women with TBI also endorsed body aches and headaches, as well as troubles with memory, focus, fatigue, cognitive concerns, sleep, and anxiety significantly more than their pre/peri-menopausal counterparts (all medium effect sizes). Among postmenopausal women, those with TBI had significantly greater frequency of hot flashes, crying spells, poor memory, worry, moodiness, panic attacks, sleep disturbance, and anxiety than women without TBI. Within TBI, only hot flashes and breast tenderness were greater in postmenopausal versus pre/peri-menopausal women. Within non-TBI, postmenopausal status was associated with significantly greater hot flashes, night sweats, restlessness, poor memory, irritability, sleep disturbance, and anxiety, with greater fatigue but not significantly.

Conclusions: The findings support a model of TBI and menopause in which symptoms most closely associated with estrogen decline in pre/peri-menopause are generally similar between women with and without TBI, and symptoms that overlap with common TBI sequelae were generally more often present and frequently experienced among women with TBI versus non-TBI. We did not observe a synergistic or potentiating effect of TBI on menopause symptoms in post-menopause. These findings offer insight that contextualizes the experience of menopause symptoms among women with TBI. Such insights are essential for the development of treatment approaches that maximize health and wellbeing during the menopause transition for women with TBI.

Categories: Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Adult)

Keyword 1: traumatic brain injury

Keyword 2: aging (normal)

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4 Women and Concussion Outcomes: What We Know and How We Can Do Better

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Objective: The vast majority of existing research on outcomes following concussion is androcentric with women notably understudied in all settings where concussion commonly occurs, including sport, military, and civilian domains. Clinical care for concussed women is, by extension, far less evidenced-based as it is largely extrapolated from male-dominated studies. We therefore sought to center concussion outcomes of women in big data sources in this investigation to capitalize on both sample size and breadth of setting in which concussion occurs.

Participants and Methods: We identified all studies with publicly released data as of 4/7/21 that included both male and female adults, enough information to determine severity of injury consistent with concussion/mild traumatic brain injury (TBI), a measure of postconcussive symptoms (PCS), and objective measures of neurocognitive functioning from the Federal Interagency Traumatic Brain Injury Research (FITBIR) Informatics System. FITBIR is a collaborative effort of the National Institutes of Health (NIH) and the Department of Defense (DoD), developed to share data across the entire TBI research community. This resulted in inclusion of six studies with a total of 9370 participants, 32% female. PCS data was drawn from the Neurobehavioral Symptom Inventory (NSI), the Rivermead Post-Concussion Symptoms Questionnaire (RPSQ), and the Sport Concussion Assessment Tool – 3rd Edition