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## Post-Traumatic Stress Disorder and alcohol dependence in young women

Nicole E. Pommer

*Washington University School of Medicine in St. Louis*

Carolyn E. Sartor

*Washington University School of Medicine in St. Louis*

Vivia V. McCutchen

*Washington University School of Medicine in St. Louis*

Elliot C. Nelson

*Washington University School of Medicine in St. Louis*

Kathleen K. Bucholz

*Washington University School of Medicine in St. Louis*

*See next page for additional authors*

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**Authors**

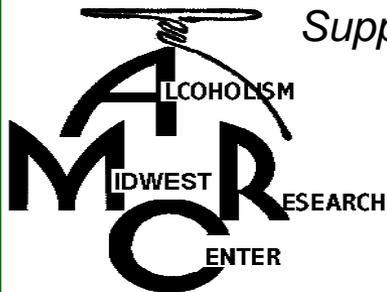
Nicole E. Pommer, Carolyn E. Sartor, Vivia V. McCutchen, Elliot C. Nelson, Kathleen K. Bucholz, Pamela A.F. Madden, and Andrew C. Heath

# Post-traumatic Stress Disorder and Alcohol Dependence in Young Women

*Findings from a Community-based Sample*

**Nicole E. Pommer, Carolyn E. Sartor, Vivia V. McCutcheon, Elliot C. Nelson, Kathleen K. Bucholz, Pamela A.F. Madden, & Andrew C. Heath**

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# Background

- Alcohol use disorders are highly prevalent in individuals who meet criteria for Post-traumatic stress disorder (PTSD).
- Studies of male combat veterans and civilians with PTSD have demonstrated that alcohol dependence is the most commonly co-occurring disorder.
- Women have higher rates of PTSD than males, but they are relatively underrepresented in this literature and much of the research on PTSD and alcohol use disorders in women comes from clinical samples.

# Aims

- To estimate the lifetime risk for alcohol dependence associated with PTSD in young women after accounting for commonly co-occurring psychiatric risk factors.
- To determine if the association between PTSD and AD is attributable to trauma exposure more generally or if PTSD presents an additional level of risk for AD.

# Participants

- Twins born between 1975 and 1985 recruited into the Missouri Adolescent Female Twin Study (MOAFTS)
- MOAFTS is a longitudinal study of alcohol use disorders and related psychopathology in female adolescents and young adults, with 5 waves of data collection (PI: Heath)
- The sample was comprised of Wave 4 participants
  - N=3,787
  - 85% self-identified as Caucasian, 15% as African-American
  - Respondents ranged in age from 18-29 (M=21.7)

# Assessment Protocol

- The Semi-Structured Assessment for the Genetics of Alcoholism (Bucholz et al., 1994) was adapted for telephone administration and used to gather DSM-IV diagnoses of AD and PTSD as well as other relevant psychiatric information.
- PTSD assessments were administered only in Wave 4.
- Other risk factors were derived from data collected at Waves 1, 3, and 4.

# PTSD Criteria

- A. Experienced or witnessed an event involving threat to life or personal integrity that induced feelings of fear, horror, or helplessness
- B. Re-experiencing symptoms (1+): 1) intrusive memories 2) distressing dreams 3) re-living of event 4) intense psychological distress when exposed to reminders 5) physiological reactivity when exposed to reminders
- C. Avoidance symptoms (3+): 1) avoidance of thoughts or feelings associated with traumatic event 2) avoidance of people, places, or activities that arouse recollections of event 3) inability to recall important aspects of event 4) diminished interest in significant activities 5) detachment from others 6) restricted range of affect 7) sense of foreshortened future
- D. Arousal symptoms (2+): 1) sleep difficulties 2) irritability or angry outbursts 3) difficulty concentrating 4) hypervigilance 5) exaggerated startle response
- E. Symptom duration of 1 month or longer
- F. Clinically significant distress or impairment in functioning

# Traumatic Event Exposure

Traumatic event exposure was queried in multiple sections of the interview:

1. A standard trauma checklist was administered.
2. Childhood physical and sexual abuse were queried in the early home environment section.
3. Forced sex was queried in the sexual maturation section.

# PTSD/Trauma Status

Respondents were categorized based on endorsement of trauma and PTSD criteria. Analyses were conducted with a 3-level PTSD/trauma variable:

- PTSD (n=138)
- Trauma exposure without PTSD diagnosis (n=1,981)
- No trauma history (n=1,649)

# Family History, Ethnicity, & Psychiatric Risk Factors by Trauma Status\*

	PTSD (%)	Trauma without PTSD (%)	No trauma (%)
Maternal alcohol problems	34.78	16.81	8.43
Paternal alcohol problems	63.77	39.68	27.77
Conduct disorder	16.28	6.24	1.92
Major depressive disorder	73.90	30.49	13.78
Regular smoking	62.32	40.79	29.00
Cannabis abuse	13.04	5.00	1.88
<b>Distribution by ethnicity</b>			
African- American	6.97	68.62	24.40
Caucasian	3.10	49.88	47.02

\*All tests of association yielded Chi-square values significant at  $p < .05$  level

# Analytic Approach

- Cox proportional hazards regression analyses were conducted with time-varying covariates to estimate risk for alcohol dependence associated with PTSD status.
- Confidence intervals were adjusted for family clustering.
- Age at time of AD report was included as a covariate.
- Adjustments were made for proportional hazards violations.

# Results of Cox Proportional Hazards Regression Analysis: Base Model

	Hazard Ratio (95% CI)
PTSD*	3.54 (2.33 – 5.38)
Trauma without PTSD	1.85 (1.49 – 2.31)
African-American ethnicity	0.43 (0.29 – 0.64)
Maternal alcohol problems	1.63 (1.26 – 2.11)
Paternal alcohol problems	1.68 (1.35 – 2.10)

\* The hazard ratio for PTSD was statistically significantly greater than the hazard ratio for trauma exposure without PTSD ( $X^2 (1)=10.41$ ;  $p<0.01$ ).

# Results of Cox Proportional Hazards Regression Analysis: Full Model

	Hazard Ratio (95% CI)
PTSD	2.19 (1.37 – 3.50)
Trauma without PTSD	1.50 (1.22 – 1.89)
African-American ethnicity	0.62 (0.41 – 0.94)
Maternal alcohol problems	1.11 (0.85 – 1.45)
Paternal alcohol problems	1.32 (1.06 – 1.64)
Major depressive disorder	1.77 (1.43 – 2.20)
Conduct disorder	0.93 (0.62 – 1.42)
Regular smoking	3.55 (2.80 – 4.50)
Cannabis abuse	2.03 (1.44 – 2.86)

# Results: Base Model

- Elevated risk for alcohol dependence was observed in women who had experienced trauma compared with those who had not, even after adjusting for maternal and paternal history of alcohol-related problems.
- Risk for AD conferred by PTSD was significantly greater than risk conferred by trauma alone.

# Results: Full Model

- Risk for AD was elevated in women who had experienced trauma, even after accounting for the contribution of parental alcohol-related problems, conduct disorder, major depressive disorder, regular smoking, and cannabis abuse to the trauma-AD association.
- After adjusting for relevant psychiatric covariates, the hazard ratio was higher for PTSD than for trauma without PTSD, but the difference was no longer statistically significant.

# Conclusions

- Findings provide further evidence for the association between PTSD and alcohol dependence in women.
- Results demonstrate that the association between PTSD and alcohol-related problems in women is not limited to clinical populations.
- Findings indicate that the relationship between trauma and AD is not explained in full by commonly co-occurring risk factors and psychopathology.
- Although no longer statistically significant after adjusting for a range of psychiatric risk factors, findings suggest that the relationship between trauma and AD is stronger in cases where PTSD develops.

# Limitations and Future Directions

- The trend toward higher risk for AD associated with PTSD vs. trauma alone may reflect severity of trauma rather than risk associated with the diagnosis of PTSD per se.
- Future studies aimed at addressing the mechanisms underlying the observed association between PTSD and AD will include examination of genetic and environmental influences that may jointly contribute to the two disorders.
- Elevation in PTSD-associated risk for other substance use disorders will also be investigated in future research efforts.