

Associations of Trauma and Early Family Environment with Suicidal Ideation and Attempt in a Female Twin Sample

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Background

- Environmental factors such as early trauma, parental alcohol problems, parental separation, and other markers of early adversity have been associated with increased risk for suicidal ideation and attempt.
- Parental alcohol problems are associated with increased risk for early adversity and for depression, anxiety, and alcohol use disorders.
- Depression, panic disorder, and alcohol use disorders are associated with increased risk for suicidal ideation and attempt, and also with early trauma and adversity.

Dinwiddie et al., 2000; Dube et al., 2001; Fergusson et al., 2000; Glowinski, 2001; Goodwin et al., 2006; Nelson et al., 2002

Aims

- We sought to examine the associations with risk for suicidal ideation and attempt of
 - Nine individual traumatic events
 - Categories of assaultive and nonassaultive trauma
 - Parental alcohol problems
 - Childhood separation from parents
 - Stepfather or mother's boyfriend presence
- We account for timing of trauma, separation from parents, and presence of stepfather or mother's boyfriend, and examine associations before and after controlling for timing of depression, panic attacks, and alcohol dependence.

Sample

- Twins born between 1975 and 1987 were ascertained using Missouri State birth records and recruited into the Missouri Adolescent Female Twin Study (MOAFTS, Heath et al., 2002).
- Data are derived from a baseline diagnostic interview (SSAGA, Bucholz et al., 1994) administered 1995-99, and a follow-up interview administered 2002-05.
- Responses from 3652 twins who had complete data on trauma and suicidal ideation and attempt are used in this analysis. We have data from both interviews on 84% of twins, and from the first interview only on 16%.
- Mean age (sd, range) of the 3061 twins with data from the most recent interview was 24.7 (2.5, 21-31), and of the 591 twins with first interview data only 22.1 (3.0, 18-29). The overall mean was 24.3 (2.8, 18-31).
- 13.9 % of twins self-identified as black. We control for ethnicity in all regressions, since black twins reported more suicide attempts and trauma than white twins.

Measures: Suicidal Ideation and Attempt

- Suicidal ideation was derived from items in the depression section and suicidal thoughts and behavior sections of both interviews, e.g., “Did you on more than one occasion think about taking your life?”, “Have you ever thought about taking your own life?” Endorsement at either interview was counted as positive for ideation.
- Suicide attempt was counted as positive if respondent endorsed “Have you ever tried to take your own life?” at either interview.
- We created 3 mutually-exclusive categories of suicidal behavior: (1) neither ideation nor attempt, (2) ideation with no attempt, (3) ideation with attempt. 3 twins endorsed attempt but not ideation. They were assigned to the ideation with attempt category.

	White (N=3143)	Black (N=509)
No ideation or attempt	81.7 %	75.1 %
Ideation only	13.7 %	14.9 %
Ideation + Attempt	4.6 %	10.0 % **

** p < .01 Black : White difference significant

Measures: Early Family Environment

- Parental alcohol problems were based on twin report of alcohol problems in biological mother or father at any time.
- Early separation from parents was defined as a period of 12 months or more before age 17 when twin lived without biological mother or father. Ages at separation(s) were obtained.
- Presence of stepfather or mother’s boyfriend in the home was defined as presence for at least 12 months in a row. Ages at presence were obtained.

	White (N=3143)	Black (N=509)
One parent alcohol problems	24.4 %	33.0 % **
Both parents alcohol problems	3.7 %	6.5 % **
Separation from mother	12.9 %	22.2 % **
Separation from father	34.5 %	75.1 % **
Stepfather present	16.3 %	14.1 %
Mother’s boyfriend present	2.7 %	2.9 %

** p < .01 Black : White difference significant

Measures: Trauma

- History of trauma is based on self-report in response to items in the PTSD and early home environment sections of the baseline interview and life events section of the follow-up interview. In addition to examining associations of individual events with risk for suicidal ideation and attempt, we defined 3 mutually-exclusive trauma categories: (1) no trauma, (2) nonassaultive trauma only, (3) assaultive trauma (childhood physical abuse or neglect, rape, molestation, physical assault, being threatened with a weapon or kidnapped). Neglect was assigned to the assaultive category because the majority (83%) of women who endorsed neglect also endorsed assaultive trauma.
- History of DSM-IV-defined depression and alcohol dependence were ascertained from the diagnostic interview; twins were coded as positive if they met criteria at baseline or follow-up interview. Lifetime history of panic attack was assessed only at baseline, in the panic disorder section of the baseline interview, and is used here as a broad measure of panic disorder.

Methods

- We used Cox regression to model the associations of each individual trauma and family environment variable with risk for (1) suicidal ideation without attempt, and (2) suicidal ideation with attempt. We used individuals with no suicidal ideation or attempt as the reference group and controlled for ethnicity in all regressions. All covariates except parental alcohol problems and ethnicity were time-varying. We tested interactions with ethnicity in all models.
- We examined associations of trauma categories with suicidal ideation and attempt as above, in 3 models: (1) with trauma categories only, (2) trauma categories and early family environment, (3) trauma categories and early environment, including control variables for depression, panic attack, and alcohol dependence.
- Where tests of the proportional hazards assumption revealed differences in risk by age, we divided the covariate into dummy variables representing different ages of risk for ages 0-8, 9-12, 13-17, 18-21, and 21+. We then collapsed these categories where Wald tests indicated no significant differences in risk.

Lifetime History of Traumatic Events, by Ethnicity

	White N=3143	Black N=509
Assaultive events		
Childhood Physical abuse	7.5	13.0 **
Childhood Neglect	1.9	5.3 **
Rape	7.3	10.8 **
Molestation	8.6	16.5 **
Severe Physical Assault	5.0	9.2 **
Threatened w. weapon	5.1	10.2 **
Nonassaultive events		
Life-threatening Accident	11.3	19.1 **
Natural Disaster	16.5	16.5
Witness injury or killing	12.7	24.9 **

* p < .05, ** p < .01 White vs. Black difference

Univariate Associations of Assaultive Traumatic Events with Suicidal Ideation and Attempt

	Ideation Only (N=506) RR (95% CI)	Ideation + Attempt (N=197) RR (95% CI)
Physical abuse	2.8 (2.2-3.5)	6.8 (4.7-9.9)
Neglect, all ages		5.6 (2.9-10.9)
Age 0-12	7.8 (3.6-16.5)	
Age 13+	3.2 (2.1-4.9)	
Rape	3.8 (2.9-5.0)	10.9 (7.1-16.7)
Molestation	3.7 (3.0-4.5)	6.5 (4.4-9.5)
Physical Assault	4.0 (2.8-5.7)	5.8 (2.8-12.2)
Weapon, all ages		5.9 (3.1-11.3)
Age 0-12	14.2 (4.9-40.7)	
Age 13+	2.4 (1.6-3.6)	

Controlling for ethnicity; Reference group is no ideation or attempt.

Univariate Associations of Non-Assaultive Traumatic Events with Suicidal Ideation and Attempt

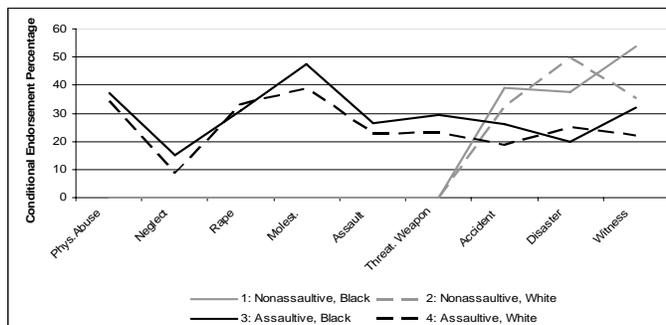
	Ideation Only (N=506) RR (95% CI)	Ideation + Attempt (N=197) RR (95% CI)
Accident	1.7 (1.3-2.3)	3.0 (1.7-5.2)
Disaster	1.5 (1.2-1.9)	1.8 (1.1-2.9)
Witness		Black & White
Black	2.7 (1.8-4.2)	Age 0-12 8.1 (2.5-25.8)
White	1.5 (1.1-2.1)	Age 13+ 1.8 (1.0-3.3)

Controlling for ethnicity; Reference group is no ideation or attempt

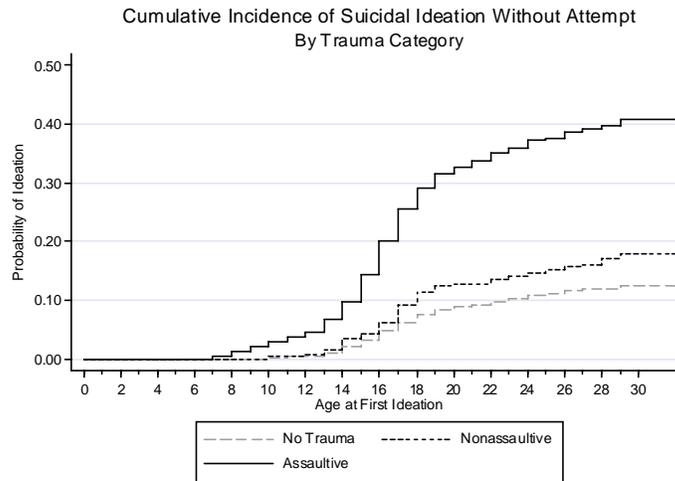
Characteristics of Trauma Categories and Trauma Endorsement within Categories

	No trauma n=1955	Non-assaultive trauma only n=827	Assaultive trauma n=870
Black (%)	10.3	15.7	20.3
Depression (%)	15.5	24.4	49.0
Panic Attack (%)	4.9	8.9	24.6
Alcohol Dependence (%)	7.8	12.2	19.7
Number traumatic events (mean, sd)	0.0	1.2 (0.4)	2.3 (1.4)
Age first event (mean, sd)	na	14.4 (5.8)	10.1 (5.9)

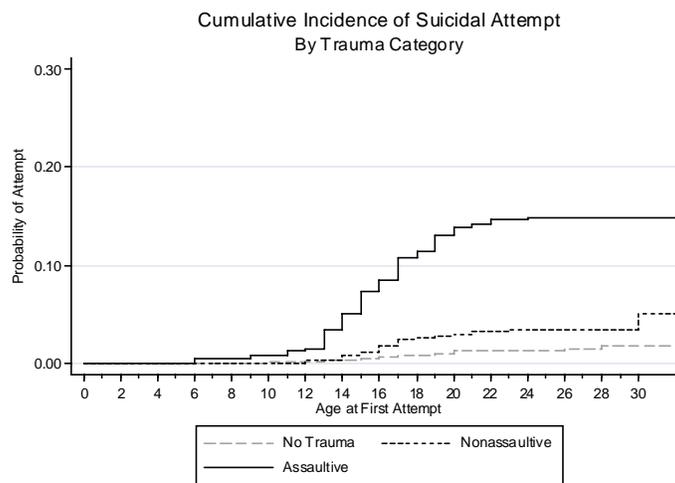
Traumatic event endorsement by trauma category and ethnicity



Suicidal Ideation by Trauma Category



Suicidal Ideation + Attempt by Trauma Category



Predicting Suicidal Ideation without Attempt

	Model 1 RR (95% CI)	Model 2 RR (95% CI)	Model 3 RR (95% CI)
Assaultive trauma, any age		3.5 (2.9-4.3)	
age 0-8	22.6 (5.8-87.7)		15.1 (3.9-58.7)
age 9+	3.8 (3.2-4.6)		2.2 (1.7-2.7)
Non-assaultive trauma	1.4 (1.1-1.8)	1.4 (1.1-1.8)	ns
Parent alcohol problems			
One biological parent		1.2 (1.1-1.4)	ns
Both biological parents		1.5 (1.1-2.0)	ns
Sep from biological mom		1.4 (1.0-1.9)	ns
Live w. mom's boyfriend		2.8 (1.4-5.5)	2.4 (1.2-5.0)

Model 1: trauma only; Model 2: trauma + family factors; Model 3: controls for respondent depression, panic attacks, alcohol dependence. Ethnicity included as control in all models. ns not statistically significant

Predicting Suicide Attempt

	Model 1 RR (95% CI)	Model 2 RR (95% CI)	Model 3 RR (95% CI)
Assaultive trauma, any age	10.5 (7.0-16.6)		
0-17		10.5 (6.4-17.4)	----
18-21		7.9 (3.5-17.5)	----
22+		ns	----
0-21		----	5.9 (3.5-9.8)
22+			ns
Non-assaultive trauma	2.7 (1.5-4.8)	2.5 (1.3-4.5)	2.3 (1.2-4.2)
Parent alcohol problems			
One biological parent		1.6 (1.2-2.1)	1.4 (1.0-1.9)
Both biological parents		2.4 (1.4-4.2)	1.9 (1.1-3.6)

Model 1: trauma only; Model 2: trauma + family factors; Model 3: controls for respondent depression, panic attacks, alcohol dependence. Ethnicity included as control in all models. ns not statistically significant

Conclusions

- All traumatic events had a stronger association with risk for suicidal attempt than with risk for ideation only.
- The cumulative incidence of suicidal ideation and attempt were greatest, and occurred at younger ages, in twins who reported experiencing assaultive trauma.
- The assaultive trauma category had a stronger association with risk for suicidal ideation before age 9 than later in models 1 and 3. The differences in risk with addition of covariates suggests that, for model 2, parental alcohol problems and separation from mother are correlated with trauma before age 9, but that in model 3, which controls for twin's own psychopathology, they are correlated more strongly with psychopathology.

Conclusions

- When predicting suicide attempt, parental alcohol problems retained significance when controlling for twin's own psychopathology, suggesting an influence that is independent of potential familial/genetic influences on risk for psychopathology and suicide attempt.
- Stepfather presence was not significant in any model, but presence of mother's live-in boyfriend was a predictor of suicidal ideation, independent of trauma and psychopathology. One potential explanation for this is that live-in boyfriends are a marker for environmental stressors, such as household tension or alienation from mother, that are associated with risk for suicidal ideation. It is noteworthy that boyfriend presence had no association with suicide attempt, however.
- The higher rates of suicide attempt, trauma, and other environmental risks among Black women merit special attention. Analyses which include measures of neighborhood effects may elucidate broader environmental effects on mental health than are used in this study.