

2003

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Qiang Fu
St. Louis University

Andrew C. Heath
Washington University School of Medicine in St. Louis

Julia Grant
Washington University School of Medicine in St. Louis

Kathleen K. Bucholz
Washington University School of Medicine in St. Louis

William R. True
St. Louis Univeristy

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Recommended Citation

Fu, Qiang; Heath, Andrew C.; Grant, Julia; Bucholz, Kathleen K.; and True, William R., "Early use of alcohol or cigarettes in relation to alcohol and nicotine use disorders: A retrospective co-twin control study" (2003). *Posters*. Paper 17 Samuel B. Guze Symposium on Alcoholism.
<https://digitalcommons.wustl.edu/guzeposter2003/17>

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Early Use of Alcohol or Cigarettes in Relation to Alcohol and Nicotine Use Disorders: A Retrospective Co-twin Control Study

Qiang Fu,^a M.D., Ph.D. Andrew C. Heath,^b D.
Phil, Julia Grant,^b Ph.D., Kathleen K. Bucholz,^b
Ph.D., William R. True,^a Ph.D., M.P.H.

^a Department of Community Health
School of Public Health
St. Louis University

^b Department of Psychiatry
School of Medicine
Washington University



Purpose

- The focal point of this study was to examine the relationship between early onset of alcohol or cigarette use and alcohol and nicotine use disorders in a sample of adult male twins:
 - Does early onset of regular alcohol consumption confer excess risk for subsequent nicotine use disorder after controlling for early onset of regular cigarette use?
 - Does early onset of regular cigarette use confer excess risk for subsequent alcohol use disorders after controlling for early onset of regular alcohol consumption?

Sample

- The data reported here were from the Vietnam Era Twin Registry (VETR). The Registry contains 7,369 male-male twin pairs born between 1939 and 1957 where both siblings served on active military duty during the Vietnam era.
- 53.5% of pairs were identified as monozygotic and 43.8% as dizygotic; 2.7% were excluded due to indeterminate zygosity. Zygosity was assessed by a series of questions about sibling similarity with 95% accuracy.

Sample

- In 1987, a mailed questionnaire survey of health, including assessments on cigarette use behaviors, was administered to all members in the VETR. Of 14,738 twins in the registry, 74.4% twins (N=10,981) or 64.7% pairs (N=4,774 pairs) were successfully interviewed.
- In 1992, A telephone interview survey was conducted to collect data on lifetime substance use disorders and psychiatric comorbidity in the VETR panel using a computerized telephone version of the Diagnostic Interview Schedule, Version 3, Revised (DIS-III-R), which was based on Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R) criteria. Of 10,300 eligible twins (5,150 pairs), 79.7% individuals or 66.1% pairs completed interviews. Over 90% of twins who were interviewed in 1992 participated in the 1987 survey.
- A total of 3,360 twin pairs in which both members completed the diagnostic interview were selected for the current analysis.

Sample Profile

- The mean age at interview:
 - 42.0 years (SD \pm 2.7, range 33-52 years)
- Ethnicity:
 - 93.8% were non-Hispanic white,
 - 5.8% were African American,
 - <1% were Hispanic,
 - 0.3% were other
- Education:
 - 33.3% were high school graduates
 - 38.7% college graduates
- Employment:
 - 98.2% full-time and 1.8% part-time

Sample

- Of those regular alcohol users, 18% twins reported initiating regular alcohol consumption before age 17. There were 686 twin pairs where one member initiated regular alcohol use before age 17, while the other had not used alcohol regularly until age 17 or older.
- Of those regular smokers, 34% twins reported starting regular cigarette use before age 17. There were 433 twin pairs where one member started regular cigarette use before age 17, while the other had not consumed cigarettes regularly until age 17 or older.

Measures

- Outcome measures
 - Lifetime DSM-III-R alcohol abuse, alcohol dependence, and alcohol abuse or dependence
 - Lifetime DSM-III-R nicotine dependence
- Primary Predictors
 - Early age-at-onset of regular alcohol consumption: drinking alcohol at least once a month for a period of 6 months or more before age 17
 - Early age-at-onset of regular cigarette use (derived from the 1987 survey): regular use of cigarettes before age 17
- Other covariates
 - Lifetime DSM-III-R conduct disorder, major depression, posttraumatic stress disorder, and illicit drug dependence

Statistical Analysis

- Conditional logistic regression models were used to test for excess risk associated with early onset of regular alcohol or cigarette users in discordant twin pairs, comparing early onset users with their co-twin who was later onset of regular users and with their co-twin who was non-regular users.
- Conditional logistic regression models were conducted separately for alcohol use disorders and nicotine use disorder.
- In the analyses, each conditional logistic regression model included early onset of regular use of alcohol and cigarettes, plus other psychiatric disorders.
- Conditional odds ratios (ORs) and 95% confidence intervals (CIs) were reported to quantify the associations between early onset of substance use and substance use disorders.

Table 1. Lifetime DSM-III-R alcohol and nicotine use disorders in 686 male twin pairs discordant for early use of alcohol or cigarettes

	Early Onset No. (%)	Co-twins No. (%)	Odds Ratio	95% Confidence Interval
Onset of Alcohol Use				
Alcohol Abuse	130 (46.3)	146 (38.3)	1.39*	1.01, 1.89
Alcohol Dependence	405 (59.0)	305 (44.5)	1.80*	1.45, 2.23
Alcohol Abuse or Dependence	531 (77.9)	450 (65.7)	1.84*	1.45, 2.33
Nicotine Dependence	206 (78.0)	511 (73.3)	1.29	0.92, 1.81
Onset of Cigarette Use				
Alcohol Abuse	82 (47.4)	106 (44.9)	1.11	0.75, 1.64
Alcohol Dependence	260 (60.1)	295 (55.6)	1.20	0.93, 1.56
Alcohol Abuse or Dependence	341 (79.0)	399 (75.4)	1.22	0.90, 1.66
Nicotine Dependence	387 (77.6)	360 (72.1)	1.33	1.00, 1.78

Results

- Univariate analyses in regular users of alcohol or cigarettes (Table 1)
 - Early-onset alcohol use was associated with elevated risk for alcohol abuse (OR=1.39), alcohol dependence (OR=1.80), and alcohol abuse or dependence (OR=1.84), but not the risk for nicotine dependence, compared to later-onset alcohol use.
 - Early-onset cigarette use was not associated with excess risk for alcohol use disorders compared to later-onset cigarette use. Early-onset cigarette use might be associated with greater risk for nicotine dependence (OR=1.33, 95% CI=1.00, 1.78) than later-onset cigarettes use.

Table 2. Conditional logistic regression analysis of early versus later use of alcohol or cigarettes in relation to alcohol and nicotine use disorders after controlling for other covariates

	Early Alcohol Use		Early Alcohol Use	
	OR	(95% CI)	OR	(95% CI)
Alcohol Abuse	1.31	(0.82, 2.09)	0.81	(0.54, 1.21)
Alcohol Dependence	1.95*	(1.46, 2.59)	0.87	(0.65, 1.16)
Alcohol Abuse or Dependence	2.11*	(1.54, 2.90)	1.17	(0.85, 1.62)
Nicotine Dependence	1.18	(0.84,1.64)	1.33	(0.98, 1.80)

Note: Odds ratios (OR) and 95% confidence intervals (CI) were adjusted for the effects of lifetime DSM-III-R conduct disorder, major depression, posttraumatic stress disorder, and drug dependence. * $p < 0.05$

Results

- Multivariate analyses in regular users of alcohol or cigarettes (Table 2)
 - Compared to later-onset alcohol use, early-onset alcohol use doubled the risk for alcohol dependence or alcohol abuse or dependence, but not the risk for nicotine dependence, after controlling for lifetime DSM-III-R conduct disorder, major depression, posttraumatic stress disorder, and illicit drug dependence.
 - Early-onset cigarette use did not confer greater risk for alcohol or nicotine dependence than later-onset cigarette use, after controlling for other psychiatric disorders.

Table 3. Conditional logistic regression analysis of early or later versus non-regular use of alcohol or cigarettes in relation to alcohol and nicotine use disorders after controlling for other covariates

	Early Alcohol Use		Later Alcohol Use		Early Cigarette Use		Later Cigarette Use	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Alcohol Abuse	15.53*	(6.04, 39.91)	11.87*	(5.12, 27.50)	1.91*	(1.06, 3.46)	1.24	(0.83, 1.85)
Alcohol Dependence	38.80*	(13.61, 110.68)	19.95*	(7.25, 54.93)	1.41	(0.99, 2.02)	1.63*	(1.22, 2.17)
Alcohol Abuse or Dependence	44.51*	(19.48, 101.73)	21.08*	(9.78, 45.41)	1.60*	(1.10, 2.32)	1.36*	(1.03, 1.79)
Nicotine Dependence	1.17	(0.65, 2.12)	0.99	(0.60, 1.65)	30.57*	(17.89, 52.25)	23.08*	(14.23, 37.43)

Note: Odds ratios (OR) and 95% confidence intervals (CI) were adjusted for the effects of lifetime DSM-III-R conduct disorder, major depression, posttraumatic stress disorder, and drug dependence. * p<0.05

Results

- Multivariate analyses in regular, non-regular, and never users (Table 3)
 - Regular use of alcohol was not associated with greater risk for nicotine dependence compared to non-regular alcohol use, after controlling for other psychiatric disorders.
 - In contrast, regular cigarette use conferred excess risk for alcohol use disorder (OR: 1.36 – 1.91) even after controlling for regular alcohol use and other psychiatric disorders.

Conclusions

- Although early onset of regular alcohol use confers excess risk for alcohol use disorders, it does not increase risk for nicotine dependence in this sample.
- Initiation of regular cigarette use is associated with increased risk for alcohol use disorders, after controlling for early onset of alcohol use and other covariates.
- Preventing initiation of cigarette use and early onset of alcohol consumption may reduce risk for later development of alcohol use disorders.