

Risk Factors for Developing Cravings, Withdrawal Symptoms and Tolerance in Adolescents

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Background

- Cravings, withdrawal and tolerance are hallmarks of nicotine dependence (ND), and have been incorporated into most diagnostic ND criteria.
- No studies to date distinguish between risk factors for each of cravings, withdrawal and tolerance

Objective

- To identify risk factors for each of cravings, withdrawal symptoms and tolerance in adolescence.

Design

- Data were drawn from the Nicotine Dependence in Teens Study, a prospective investigation of 1293 students recruited from grade 7 classes in a convenience sample of 10 Montreal-area high schools.
- 319 novice smokers were followed every 3 months from first puff until the event of interest or until they were censored.
- Outcomes included time to first report of cravings, withdrawal symptoms, and tolerance.

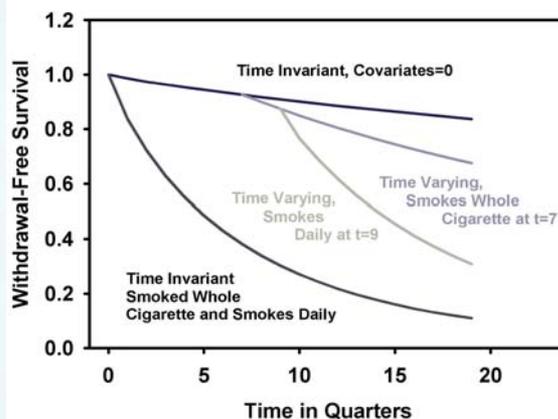
Data Analysis

- Independent predictors of elapsed time from first puff to each outcome were identified in 3 separate Cox regressions.
- All non-events were treated as censored at each time point, and reborn into the risk-set for the next time point, with the prior event time set as time-of-entry.
- A series of single predictor analyses were conducted using Cox regressions, to select candidate covariates for multiple regression models. Predictors attaining $P=0.2$ were entered into a final regression
- The proportional hazards assumption was tested using scaled Schoenfeld residuals. A correlation matrix was examined after estimation for large values indicating confounding among predictors.

Characteristics of participants retained and excluded in the analysis.

	Retained n=319	Not retained* n=41	P-value
Age, yr, mean (SD)	12.7 (0.4)	12.7 (0.5)	0.406
Male, %	42.6	48.8	0.455
Language, %			0.206
English	61.0	56.1	
French	23.0	17.1	
English/French	16.0	26.8	
Single-parent family, %	8.5	9.8	0.781
No. of siblings, mean (SD)	1.7 (1.3)	1.9 (1.5)	0.434
Spent entire life in Canada	93.1	90.2	0.513
Father smokes, %	21.6	24.4	0.902
Mother smokes, %	18.5	19.5	0.982
Brother(s) smoke(s), %	6.6	12.2	0.191
Sister(s) smoke(s), %	6.3	2.4	0.325
Friends smoke, %	27.6	26.8	0.919
Mother's education, %			0.747
Less than university	48.0	53.7	
University	39.2	36.6	
Missing	12.9	9.8	

*Includes participants who initiated tobacco use during follow-up but were excluded from subsequent analysis because time of first puff could not be determined.



Results

- Female sex, inhalation, smoking a whole cigarette, weekly smoking, daily smoking, and alcohol use independently increased the incidence of the onset of cravings.
- Inhalation, weekly and daily smoking, and alcohol use predicted the onset of withdrawal symptoms.
- Withdrawal symptoms, smoking a whole cigarette, monthly and daily smoking, and friends and siblings smoking increased the incidence of the onset of tolerance.
- None of parental education, impulsivity, novelty-seeking, self-esteem, depression, stress, parental smoking, physical activity, or participation in sports teams was associated with the outcomes.

Conclusions

- The hallmarks of early nicotine dependence are related to intensity and frequency of cigarette use.
- Avoidance of daily smoking may be particularly important in preventing the onset of ND symptoms and sustained smoking.

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