

Epidemiology of Substance Abuse

Denise B. Kandel, PhD, Chief, Research Scientist VII

Pamela Griesler, PhD, Research Scientist IV

Christine Schaffran, MA, Research Scientist IV

Mei-Chen Hu, PhD, Staff Associate, Dept. of Sociomedical Sciences, School of Public Health (CU)

Mark Davies, MPH, Lecturer, Dept. of Biostatistics, School of Public Health (CU)

Overview

This department investigates the natural history of drug involvement, the risk factors and consequences of drug abuse, and comorbidity of substance abuse with problem behaviors and psychiatric disorders in adolescents and adults. Cigarette smoking and nicotine dependence represent a major focus of current research activities with an emphasis on (1) nicotine dependence; (2) ethnic differences in the epidemiology and etiology of adolescent smoking; (3) the impact of maternal smoking during pregnancy and postnatally on smoking and behavior problems in offspring; and (4) the association between nicotine metabolism, smoking patterns and dependence. A major current research activity is a longitudinal follow-up of the transition to nicotine dependence in adolescence. A major goal of the study is to describe the natural history and risk factors for nicotine dependence in different ethnic groups, and to examine the comorbidity, sequencing and reciprocal effects between depression and other psychiatric disorders, smoking and nicotine dependence.

Current Research

We completed the data collection on a cohort of 1,039 urban adolescents and their mothers from our longitudinal study on the *Transition to Nicotine Dependence in Adolescence*. We implemented the collection of saliva samples for DNA extraction and future investigation of the genetics of nicotine dependence in adolescence.

This past year, we investigated the sources of inconsistent reporting of smoking in school and in the household; the natural history of the development of symptoms of nicotine dependence; and the various developmental trajectories of dependence symptoms following onset of smoking.

We also continued our analyses of smoking and nicotine dependence in a national representative sample of young adults. We completed analyses of ethnic differences in patterns of smoking at the national level and of the relationship between nicotine metabolism, extensiveness of smoking and nicotine metabolism.

We have initiated a completely novel area of research, focused on the molecular basis of epidemiological paradigms in mice, in collaboration with Drs. Eric Kandel and Amir Levine from the Center for Neurobiology and Behavior. This approach will enable us to establish causal relationships underlying smoking behaviors that are not possible to establish in human populations studied in epidemiological studies.

Education and Training

We are monitoring two post-doctoral fellows: Dr. Hu in our department and Dr. Levine in the Center for Neurobiology and Behavior.

Highlights

By following a cohort of adolescents, we have identified how long it takes for young people to become dependent on nicotine.

We have also identified factors that predispose a young person to become dependent.

We established that 25% of youths (mean age 16.1 years) experience the full syndrome of nicotine dependence within 23 months of having started to smoke. Pleasant initial sensitivity to the tobacco use experience and parental dependence are significant predictors of the adolescent transition to nicotine dependence.

There are race/ethnic differences in rates of nicotine metabolism in a national sample of young adult smokers. African Americans have slower metabolism than whites. This finding, based on a non-invasive measure of nicotine metabolism, is consistent with laboratory studies on older smokers based on intravenous infusion of nicotine. However, no significant association was observed between the nicotine metabolite ratio and the number of cigarettes smoked per day or nicotine dependence.

We initiated a novel program of research on the molecular basis of epidemiological paradigms in mice.