

ACUTE EFFECTS OF NICOTINE ON ENERGY BALANCE. Kenneth A. Perkins. Western Psychiatric Institute, University of Pittsburgh School of Medicine, Pittsburgh, PA.

Cigarette smoking is inversely related to body weight, demonstrating that smoking must cause an alteration in energy balance either by decreasing caloric intake, increasing caloric expenditure (especially metabolic rate), or both. Animal research strongly indicates that nicotine is the primary constituent of tobacco smoke which is responsible for smoking's effects on body weight. In order to more fully understand the role of nicotine in explaining smoking's effect in humans, our research effort has focused on the acute effects of nicotine on caloric intake and metabolic rate in male smokers using a measured-dose nasal spray method developed in our lab. We have found that nicotine intake typical of that of average smokers decreases caloric intake during an ad lib meal situation (without regard to sweet vs. nonsweet taste) and prolongs feelings of satiety following meal consumption. However, there is no effect of nicotine in altering taste preference or perception, apparently ruling this out as a possible mechanism to explain nicotine's appetite-suppressing effect. On the caloric expenditure side of the energy balance equation, we have found that nicotine produces a small but significant increase in metabolic rate at rest which is *enhanced* during light physical activity (typical of routine occupational or household tasks) but appears to be *reduced* in conjunction with the metabolic effects of meal consumption. Possible mechanisms responsible for these findings, an examination of chronic effects of smoking (i.e., smokers vs. nonsmokers) on energy balance, and results of newer research with female smokers will be discussed.

POSTCESSATION WEIGHT GAIN: CONTRIBUTIONS OF DIET AND LIPOPROTEIN LIPASE. Scott J. Leischow. Palo Alto Center for Pulmonary Disease Prevention; Maxine L. Stitzer, Andrew P. Goldberg and Ann Morrison. Johns Hopkins University Medical School, Baltimore, MD.

Weight gain is a common and usually unwanted result of smoking cessation, though the mechanisms contributing to the weight gain are unclear. The present study was designed to assess changes in caloric intake, metabolism, and physical activity as contributors to postcessation weight gain. Subjects were 16 healthy male smokers assigned in an inpatient setting to either smoke ad lib or quit smoking for a period of at least ten days after a four-day baseline period. Caloric intake and physical activity were assessed daily. Fasting levels of adipose tissue lipoprotein lipase (LPL), an enzyme that regulates the uptake and storage of triglycerides into fat cells, were assessed during the baseline period and at the end of the study. As expected, abstainers gained significantly more weight than smokers. Supporting earlier research, baseline LPL was positively correlated with the amount of postcessation weight gain in abstainers; however, the same relationship was found with smokers. Thus, the more adipose tissue LPL found during the baseline period, the greater the weight gain by the end of the study, regardless of whether a subject smoked or abstained. Caloric intake did not increase in smokers, but increased significantly over the course of the 10-day period in abstainers. On average, abstainers ate 578 more calories per day than smokers. When predicted daily caloric needs were compared with actual daily caloric intake, it was found that the excess caloric intake (above predicted daily needs) accounted for most of the weight gain. There was no difference between groups in physical activity. It is likely that increased caloric intake is the predominant contributor to postcessation weight gain, though a more

fundamental metabolic process involving LPL may contribute to the increased caloric intake. The implications of this research on the mechanisms and prevention of postcessation weight gain will be discussed.

PHARMACOLOGIC INTERVENTION FOR POSTCESSATION WEIGHT GAIN: THE ROLE OF PHENYLPROPANOLAMINE. Robert C. Kleges. Memphis State University, Memphis, TN.

It has been well documented that smokers weigh less than nonsmokers, those who start smoking lose weight, and those who quit smoking gain weight. Most professional and lay people are aware of the weight-control properties of smoking. As such, the first purpose of the proposed presentation will be to overview the volitional use of smoking as a weight-control strategy. Recent empirical data, drawn from community surveys as well as prospective clinical trials, will demonstrate that the weight-control properties of smoking play an important role in both smoking maintenance as well as smoking relapse. Given the use of smoking as a weight-control strategy, it is important to develop effective interventions for reducing postcessation weight gain. One promising drug for the reduction of small amounts of weight is phenylpropanolamine (PPA). To evaluate the effect of PPA on postcessation weight gain, 57 smokers were randomly assigned, in a double-blind procedure, to chew gum with PPA, placebo gum, or no gum. After a baseline assessment, subjects were paid to quit smoking for a period of two weeks. Smoking cessation was verified bi-weekly, as well as random (spot), carbon monoxide assessment. Results indicated that 72% of smokers were successful in quitting smoking. Relative to the other two conditions, abstinent subjects receiving PPA gained significantly less ($p < 0.05$) weight. Additionally, abstinence rates were significantly higher in subjects receiving PPA ($p < 0.05$) relative to the other two conditions. Subjects in the PPA group also significantly reduced their dietary intake, relative to the other two groups. No changes in physical activity were observed. It is concluded that PPA may be an important method of reducing weight gain associated with smoking abstinence and may enhance smoking cessation efforts in certain individuals. The results of this investigation will be compared to other pharmacologic and nonpharmacologic approaches for reducing postcessation weight gain.

POSTSMOKING CESSATION WEIGHT GAIN: PREVENTIVE INTERVENTION WITH d-FENFLURAMINE. Bonnie Spring, Judith Wurtman, Ray Gleason, Richard Wurtman and Kenneth Kessler. The Chicago Medical School, North Chicago, IL.

Quitting smoking can result in weight gain, but the mechanisms responsible remain unclear. Several reports indicate that caloric intake increases after discontinuing the use of nicotine. Increases in carbohydrate and fat consumption have both been reported, but contradictory findings also exist. We directly measured caloric and macronutrient intakes before and after smoking cessation to test whether caloric and specifically carbohydrate (CHO) intake would increase and be associated with weight gain. In addition, we tested whether d-fenfluramine would suppress symptoms associated with withdrawal from smoking, including overeating and weight gain. Overweight, female chronic smokers ($n = 31$), undergoing behavioral treatment to stop smoking were randomly assigned on a double-blind basis to receive d-fenfluramine (15 mg b.i.d.) or placebo for one week before quitting smoking and four weeks afterward. Direct measurements of caloric and nutrient consumption were made over three two-day periods prior to the initiation of drug treatment, 48 hours and 4 weeks after cessation. Weight was

assessed at baseline and after 4 weeks of drug treatment. Calorie and carbohydrate intakes differed significantly between drug- and placebo-treated subjects during the smoking withdrawal period ($p < 0.001$). By 48 hours after discontinuing smoking, placebo-treated subjects consumed approximately 300 calories more per day than during the baseline measurement period. This increase, largely from increased consumption of carbohydrate-rich meals and snack foods, was sustained throughout the 4-week follow-up period. d-Fenfluramine-treated subjects also significantly increased consumption of carbohydrate-rich snack foods 48 hours after smoking withdrawal. However, their calorie and nutrient intakes returned to baseline levels after 4 weeks of treatment. The weight of the subjects at 4 weeks reflected their differences in caloric intake: the placebo group *gained*, on average, 3.5 lb (s.d. = 3.2); the d-fenfluramine group *lost*, on average 1.8 lb (s.d. = 5.0) ($p < 0.001$). Findings suggest that 1) increased calorie and carbohydrate intakes after discontinuing smoking contribute meaningfully to weight gain, and 2) drugs that enhance serotonin-mediated neurotransmission may help to prevent overeating and weight gain usually associated with smoking withdrawal.

WEIGHT CONTROL AND MAINTAINING NONSMOKING: TWO INCOMPATIBLE HEALTH GOALS. Joanne Duffy, Chrystal Tunstall, Kathy Vila, Carol Duncan and Sharon Hall. San Francisco Veterans Administration Medical Center, San Francisco, CA.

Weight gain after smoking cessation is common. Fear of gaining weight may be a barrier to quitting smoking. We hypothesized that incorporating weight gain prevention strategies into smoking cessation treatment would both prevent weight gain and promote abstinence. To test this hypothesis we developed an innovative intervention based on weight monitoring, individualized diet and exercise plans and behavioral skills and tested it in a controlled trial. We randomized 158 smokers into three treatment groups: innovative intervention, a nonspecific control similar in contact and credibility, and a standard control. All subjects participated in a smoking cessation treatment using aversive smoking techniques and relapse prevention skills in seven sessions over two weeks. The innovative and nonspecific control groups met for five additional sessions over four weeks to receive the weight gain prevention intervention. Smoking status and body weight were recorded before treatment and at weeks 2, 6, 12, 26, and 52 after treatment. A subsample of subjects completed diet and activity records. Abstinence was determined by breath carbon monoxide levels and by urinary and blood cotinine levels. Preliminary analysis indicated that weight changes varied as expected by condition. At the end of the weight gain prevention intervention (week 6), covariate-corrected mean weight changes were: innovative condition, -0.05 lb; nonspecific treatment, $+1.23$ lb; and standard treatment, $+1.50$ lb. Preliminary results indicated surprising abstinence rate differences. The weight gain intervention conditions did not differ and showed poorer abstinence rates overall than the standard treatment condition. At week 52, abstinence rates were: active conditions 21%, and standard treatment conditions 35% ($LR \chi^2 (N = 158) = 7.29, p < 0.006$). These results suggest that incorporating weight gain prevention strategies into smoking cessation programs may be counter-productive to the desired outcome of maintaining nonsmoking. Analyses of changes in nutrition and activity levels are being completed. Data from these analyses will be presented. We will discuss the implications for smoking cessation treatment and for understanding cessation-induced weight gain.

SYMPOSIUM

Substance Abuse and the Media: Individual and Community Perspectives

Chair: James L. Sorensen, University of California, San Francisco, CA

Discussant: Susan Lachter David, National Institute on Drug Abuse, Baltimore, MD

THE PRESENTATION OF AIDS AND INTRAVENOUS DRUG USE IN THE MEDIA. Don C. Des Jarlais. Beth Israel Medical Center, New York, NY.

The AIDS epidemic has been one of the most covered health/science stories in the last decade. Intravenous (IV) drug users are the second largest group of persons to have developed AIDS in the United States and are the predominant source of both heterosexual and perinatal transmission of AIDS in the United States. Because IV drug users have a relatively low level of group organization, reducing the spread of HIV among drug injectors will require prevention programming funded by outside sources, with public funding providing the greatest share. Because relatively few persons in the country personally know someone who injects illicit drugs, support for publicly funded AIDS prevention efforts will be largely determined by ways in which this complex problem is presented in the media. This presentation will review the first eight years of mass media stories on AIDS among IV drug users. It is based on a file of over 1000 relevant media stories, and informal discussions with reporters, editors, press relations officers, and other "experts" in the field. Several themes have repeatedly emerged in media coverage of AIDS among IV drug users: 1) A relative lack of presentation of IV drug users with AIDS. 2) An overrepresentation of AIDS in children of IV drug users. 3) Large fluctuations in the estimated threat of heterosexual transmission from IV drug users. 4) Difficulties in presenting the relationships of ethnic group membership to IV drug use and AIDS. 5) A polarizing focus on "free needles" as an AIDS prevention program. These themes can be seen as the expressions of the need for "newsworthy" stories and the need to fit new stories into previous coverage of both AIDS and illicit drug use. AIDS among IV drug users is one of the better examples of where the role of the media will be critical in controlling a potential public health catastrophe. Additional study, with formalized methodology and research funding, is greatly needed.

COMMUNICATION OF HEROIN OVERDOSE INFORMATION. James L. Sorensen and Julie London. University of California, San Francisco, CA; Donald Tusel. Veteran's Administration Medical Center, San Francisco, CA; Rachel Wolfe. University of California, San Francisco, CA; Allyson Washburn. Bayview-Hunter's Point Foundation; Jennifer R. Schell and Roland Dumontet. University of California, San Francisco, CA.

An unusually potent mixture of black tar heroin triggered at least 50 overdoses and 3 deaths in San Francisco one weekend in Fall 1989. To understand how patients learned of the danger, and to inform those who had not heard, we interviewed 120 heroin abusers in three outpatient drug programs during the next two weeks. The subjects were in outpatient heroin detoxification ($n = 65$) and methadone maintenance ($n = 55$), approached consecutively as they came to the clinics for treatment. Seventy-eight percent were men, 43% were ethnic minorities, 82% were unemployed, and their mean age was 39 years. They had been in treatment an average of four times. Of the 120 subjects, only 4% had not yet heard of the overdoses at the time of the interview. Of the 115 who had learned of the problem, 34% learned of it *first*