

## SHORT REPORT

# Childhood mental ability and smoking cessation in adulthood: prospective observational study linking the Scottish Mental Survey 1932 and the Midspan studies

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Education, childhood IQ, and occupational social class are associated with mortality and morbidity. One possible cause of these associations is via their impact on health behaviours such as smoking.<sup>1</sup> Less educated people are more likely to continue smoking,<sup>2</sup> but smoking is more strongly related to occupational social class than to education.<sup>3</sup> Childhood IQ is related to education and occupational social class.<sup>4</sup> Here we investigate whether mental ability at age 11 is associated with stopping smoking in adulthood.

## METHODS

The social and smoking data were from two of the Midspan prospective cohort studies conducted in the 1970s—the Collaborative study and the Renfrew/Paisley study. Participants completed a questionnaire and attended a physical examination.<sup>5</sup> Occupational social class was coded according to the registrar general's classification.<sup>6</sup> The home address of the participants at the time of screening was retrospectively postcoded to allow deprivation category as defined by Carstairs and Morris to be ascertained.<sup>7</sup> This is an area based measure obtained from four census variables—male unemployment, overcrowding, car ownership, and the proportion of heads of households in social classes IV and V. Deprivation scores were converted to seven categories ranging from 1 (least deprived) to 7 (most deprived). Participants were classified as never, past, or current smokers at midlife. Past smokers were former smokers of one year or more. Twelve pipe or cigar only smokers were excluded. Age at starting smoking was recorded for current cigarette smokers and past smokers. Data on childhood mental ability were obtained from the Scottish Mental Survey 1932 (SMS1932).<sup>8</sup> The SMS1932 tested mental

ability, using the Moray House Test (MHT), in almost all children born in 1921 attending school in Scotland on the 1 June 1932 (n=87 498).<sup>8</sup> The MHT scores were corrected for age at testing and converted to IQ type scores (mean 100; SD 15).<sup>3</sup> Ethical permission to link the Midspan and SMS1932 studies was obtained from the Multi-Centre Research Ethics Committee for Scotland. We successfully matched 938 (75%) participants from the Midspan studies to their MHT score at age 11.<sup>5</sup> The proportion of never, past, and current smokers was similar between those participants who were matched and not matched to their MHT score.<sup>5</sup>

## RESULTS

Table 1 shows the age 11 IQ scores of the Midspan sample according to smoking status at midlife. There was no significant difference in childhood IQ scores between ever smokers and never smokers. Logistic regression analysis showed the risk of ever smoking was 0.95 (95% CI 0.82 to 1.10) for each one standard deviation increase in childhood IQ. Analysis of variance revealed that current cigarette smokers had lower childhood IQ scores than past smokers. The relative rate of giving up smoking was assessed using Cox's proportional hazards regression, with the time variable as the years smoked until cessation for past smokers, and years smoked until screening for current smokers (n=667; 151 past smokers, 516 current cigarette smokers; excludes 21 with missing data on years of smoking, social class, or deprivation). The relative rate of stopping smoking associated with one standard deviation increase in childhood IQ was 1.33 (95% CI 1.13 to 1.57) after adjusting for sex, 1.25 (95% CI 1.05 to 1.50)

**Table 1** Mental ability at age 11 years according to smoking status at midlife (n=926; 541 men and 385 women)

	Smoking status at midlife			
	Never	Past	Current	Ever*
All	100.5 (14.4) 238 (25.7%)	103.7 (14.3) 159 (17.2%)	98.5 (15.3)† 529 (57.1%)	99.7 (15.2) 688 (74.3%)
Men	102.9 (15.7) 85 (15.7%)	103.9 (14.7) 125 (23.1%)	99.6 (15.4)† 331 (61.2%)	100.8 (15.3) 456 (84.3%)
Women	99.2 (13.5) 153 (39.7%)	102.9 (13.1) 34 (8.8%)	96.7 (15.0) 198 (51.5%)	97.6 (14.9) 232 (60.3%)

Data are mean (SD) and number (%). \*Combination of past and current smokers. †Significantly different from past smokers. ‡Test to compare never smokers and ever smokers (total sample:  $t_{924}=0.71$ ,  $p=0.476$ ; for men:  $t_{539}=1.17$ ,  $p=0.242$ ; for women:  $t_{383}=1.08$ ,  $p=0.283$ ). Analysis of variance to compare never, past, and current smokers (total sample:  $F_{2, 925}=7.65$ ,  $p<0.001$ ,  $\eta^2=0.016$ ; for men:  $F_{2, 538}=4.25$ ,  $p=0.015$ ,  $\eta^2=0.016$ ; for women:  $F_{2, 382}=3.40$ ,  $p=0.035$ ,  $\eta^2=0.017$ ).

after adjustment for sex and adult social class, and 1.19 (95% CI 0.99 to 1.43) after additional adjustment for deprivation category.

## DISCUSSION

In this cohort higher mental ability in childhood was not associated with starting smoking, but was associated with stopping smoking in adulthood. This study has allowed us to examine smoking cessation, prospectively, over a considerably longer period of follow up than the GLOBE study (6.5 years),<sup>2</sup> and has the advantage of examining childhood IQ data prior to the beginning of smoking for 99.3% of ever smokers. After adjustment for sex, occupational social class, and deprivation category there remained a 19% advantage in stopping smoking associated with a one standard deviation higher IQ. However, our data suggest that once variance in social class and deprivation was taken into account the effect of childhood IQ on smoking cessation was no longer significant. We do not know whether this effect is cohort specific. Since the early 1970s, smoking has been a major focus of health promotion programmes. One interpretation of the results might be that more intelligent smokers responded to the increase in health warnings that smoking was detrimental to their health and stopped smoking.<sup>9</sup> Unlike today, information about the health risks of smoking was not widely known when these smokers started smoking; otherwise, the more intelligent smokers might have chosen not to start. Further investigations are required to determine whether the factors involved in smoking cessation today are associated with IQ. Understanding the factors that influence the decision to stop smoking is important for the development and delivery of public health policies and interventions to encourage smoking cessation. Childhood mental ability at age 11 has been linked to survival up to age 76.<sup>1</sup> In subsequent studies, we will investigate whether the association between childhood IQ and mortality involves mediation via health behaviours such as smoking in adulthood.

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