eAppendix

Second-hand smoke and risk of dementia among Chinese women who do not smoke lifelong

Methods of Study

Study population were derived from participants in a 4-province study of dementia and also from participants in the 3rd wave survey of the Anhui study. Both studies used the same questionnaires for data collections, and apart from increasing the study power, adding in the Anhui helped examine the possibility of a reverse causality of the relationship between SHS and dementia (testing dementia at baseline associated with the 3rd wave follow up SHS exposure).

The four provinces study: The methods have been fully described before. In brief, in 2008-2009 we selected one rural and one urban community from each of 4 provinces [Guangdong, Heilongjiang, Shanghai and Shanxi] as the study fields, trying to recruit no fewer than 500 participants in each community. We employed a cluster random sampling method to choose residential communities from each of 4 provinces (detailed location data on request). The target population consisted of those residents aged ≥ 60 years who had lived in the areas for at least 5 years. Ethical approval for the study was obtained from the Research Ethics Committee (REC), University College London, UK, and the REC of Anhui Medical University and the local governments in China. Based on the residency list of the committees of the village and the district, we recruited a total of 4,314 participants, with the overall response rate of 93.8%. Two researchers from each centre team were trained at the Anhui Medical University, where we had completed several surveys of mental illness in older people and had a
skilled and experienced interview team.\textsuperscript{2,3} They went back to their research centres, disseminated their skills to local research teams and re-trained the interviewers. The local survey team from Guangzhou, Harbing, and Shanxi Medical Universities, and School of Public Health of Fudan University interviewed the participants at home. Permission for interview and informed consent were obtained from each participant or, if that was not possible, from the closest responsible adult. In about 5\% of the interviews, informed consent was impossible to elicit, in these cases, the nearest relative or carer were approached to provide assent to participation. The main interview materials included a general health and risk factors record, the Geriatric Mental State (GMS) questionnaire,\textsuperscript{4} and other components of the 10/66 algorithm dementia research package.\textsuperscript{5} The record, which was used in our previous studies,\textsuperscript{2} contained (1) socio-demographic information, including educational level, main occupation status and annual income, smoking and alcohol, (2) social support and relationships, (3) psychosocial aspects, (4) doctor-diagnosed cardiovascular diseases and medications and self assessed physical health, (5) adverse life events occurring in the last two years, and (6) hobbies and activities of daily living (ADL). In the general health and risk factors interview we additionally included the SHS exposure and dietary intake questionnaire, which were derived partly from the Scottish MONICA surveys.\textsuperscript{6} According to standard procedures,\textsuperscript{7} we measured systolic and diastolic blood pressure, height, weight and waist circumference for all participants.

\textit{Definition of SHS exposure}

In the general health and risk factors record, we asked the participants for information on smoking habits and SHS exposures, which were derived from the Scottish MONICA surveys.\textsuperscript{6} The current smokers were those who gave a positive answer to
“Do you smoke cigarettes now?”, with additional information including the number of cigarettes smoked daily, maximum number smoked daily in the last 2 years, and duration of smoking habit. If not currently smoking, participants were asked about their smoking history and related information. We defined ‘never-smokers’ as those who gave negative answers to both enquiries. After giving details of smoking status, all participants were asked “Have you experienced passive smoking?” with answer of Yes, or No. Afterwards, three sources of SHS exposure were given (home, workplace, and other places) and respondents were given three choices: no, none at all; yes, some; or yes, a lot. We asked all participants how many years they were exposed to each of 3 SHS sources.

Diagnosis of dementia

In this study we diagnosed dementia cases using the 10/66 dementia algorithm, which has been validated and widely used in older people with low educational levels in low- and middle- incomes countries, including China. The 10/66 dementia diagnosis requires four inputs from the interview, the GMS-AGECAT diagnostic output, the Community Screening Instrument for Dementia (CSI-D) cognitive test score (COGSCORE), the CSI-D informant interview (RELSCORE), and the modified Consortium to Establish a Registry for AD (CERAD) ten-word list learning task with delayed recall. To save our research resources and to complete each interview within time, we designed a two-phase interview. In phase one, we completed the interviews of the GMS, the CSI-D cognitive test and CERAD. The GMS data were analysed by a computer program-assisted diagnosis, the Automated Geriatric Examination for Computer Assisted Taxonomy (AGECAT), to assess the principal mental disorders for each participant. Using the three constituent components of the 10/66 algorithm
we calculated a probability of possible dementia for each participant. In phase two, which started about 8 months (± 2 months) after phase one completion, we selected the top 15% of the population who had the highest probability of having “dementia” as “probable cases” and a random sample of 5% of the rest as “probable non-cases” for the interview in each centre. The interview team completed the CSI-D informant interview for the selected participants. We employed the full 10/66 algorithm to calculate the probability in these participants, and used the same cut-off point as a previous study to diagnose dementia, which has been validated and used in China.5

The 3rd wave survey of the Anhui study: This was based on our Anhui follow-up study, the methods of which were fully described before.3 In brief, in 2001-2003 using the GMS-AGECAT interview method we examined a random sample of 3,336 residents aged ≥ 60 years in Anhui province (wave 1), with a response rate of 94.8%. One year after wave 1 investigation we re-examined 2,608 cohort members (wave 2). In 2007-2009 we carried out the 3rd wave survey, successfully interviewing 1,757 participants, with a response rate of 82.4% of surviving cohort members.3 The wave 3 interview protocol was similar to that in the 4-province study, but slightly different in the following ways.

Of 1,757 participants (aged≥65 years), 1,215 (69.2%) completed the CSI-D cognitive and the modified CERAD interview, which was due to the delaying in using the 10/66 algorithm dementia interview. Using the three of four constituent components of the 10/66 algorithm we calculated a probability of possible dementia among those who had available data of GMS-AGECAT, the CSI-D cognitive and CERAD interview. We selected the top 15% of the population who had the highest probability of having “dementia” as “probable cases” and a random sample of 5% of
the rest as “probable non-cases” for the phase two interview. For participants who had completed the GMS but not the CSI-D cognitive test and the modified CERAD interview, we included all 127 GMS-AGECAT “dementia” cases as “probable cases” and 13 “probable non-cases” who were randomly selected from participants with the GMS-AGECAT rating “well” in the interview. We completed the CSI-D cognitive and informant, and CERAD interviews where needed. The full 10/66 algorithm was used in these participants to diagnose dementia based on the cut-off point of the probability. 5
Reference List


6,071 participants

Anhui 3rd survey study, n=1757, aged >=65

Exclude
- current smokers, n=390
- former smokers, n=224
- unknown smoking status, n=60

1,083

Exclude
- men, n=236

847

Exclude
- participants without SHS data, n=1

846

Four-province study, n=4134, aged >=60

Exclude
- participants aged <65, n=981

3333

Exclude
- current smokers, n=753
- former smokers, n=413
- unknown smoking status, n=42

2125

Exclude
- men, n=597

1528

Exclude
- participants without SHS data, n=1

1,522

2,368 never-smoking women for data analysis