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Heart disease is linked to worse mental processes that, in turn, predict the onset of dementia

Coronary heart disease is associated with a worse performance in mental processes such as reasoning, vocabulary and verbal fluency, according to a study of 5837 middle-aged Whitehall civil servants. The study also found that the longer ago the heart disease had been diagnosed, the worse was the person's cognitive performance and this effect was particularly marked in men.

The study is published online in Europe's leading cardiology journal, the *European Heart Journal* [1] today (Wednesday 23 July); the authors say it is important because impaired cognition predicts the onset of dementia and death, while coronary heart disease (CHD) remains the leading cause of death in many western countries such as the UK. "It is important to elucidate the link between these two diseases," said Dr Archana Singh-Manoux, who led the research. "The prevalence of dementia rises with age, doubling every four to five years after the age of 60, so that over a third of people older than 80 are likely to have dementia."

Dr Singh-Manoux, a Senior Research Fellow at University College London (UK) and INSERM (Institut national de la santé et de la recherche médicale, France), continued: "This is the first, large study to examine the association between coronary heart disease and cognition. Until now, research on the link between cardiovascular disease and dementia has focused more on cerebrovascular disease than CHD. However, it is CHD and not cerebrovascular disease that makes up the bulk of cardiovascular disease and is a major health problem in the developed world.

"The major risk factors for CHD are cigarette smoking, diabetes, high cholesterol levels and high blood pressure. All of these are modifiable, and smoking, diet and physical exercise are key targets for prevention. Our results on the link between CHD and cognition underline the importance of these preventive measures by highlighting the impact of these risk factors not only on CHD but also on people's cognitive functioning."

As part of the long-running "Whitehall II" study, which was started in 1985 by Professor Sir Michael Marmot, Dr Singh-Manoux and her colleagues assessed the mental processes of 5837 out of 10308 civil servants working in Whitehall (London, UK), who were aged 61. They measured verbal and mathematical reasoning, vocabulary, verbal fluency, short-term verbal memory and they also measured global cognitive status using a mini-mental-state-examination (MMSE). The researchers assessed CHD events, including non-fatal myocardial infarction and definite angina. The date of the cognitive testing was used to classify the first CHD event as having occurred within the last five years, between five to ten years ago, or over ten years ago.

They found that among both men and women a history of CHD was associated with lower scores for reasoning, vocabulary and their global cognitive status (MMSE), when compared to people who had no CHD history. In women, these effects were also seen for verbal fluency.

Men whose first CHD event was over ten years ago had lower scores for reasoning, vocabulary, semantic fluency (the part of verbal fluency relating to the categories of words) and MMSE. In women the analysis was on smaller number of CHD events, but revealed a trend for lower scores for semantic fluency if they were diagnosed with CHD over ten years ago. Dr Singh-Manoux said: "For example, in men the risk of poor performance on reasoning decreased by about 30% for every five years from the time of the first diagnosis of CHD."

At this stage the researchers do not know why there is a link between CHD and poor cognitive function, or what the possible causal mechanisms might be. "It is possible that shared risk factors drive this association. It is also possible that heart disease influences cognition through cerebral embolism or decreased cerebral perfusion," explained Dr Singh-Manoux.

She and her colleagues are collecting more data from the study in order to gain a greater understanding of the extent of the effect of CHD on cognitive functioning. A key aspect of their research is the need to collect data while people are still relatively young (middle-aged) as opposed to elderly when other age-related conditions could obscure or confound their findings.

"Our core hypothesis is that the identification of the risk factors for dementia needs to focus on the determinants of cognitive ageing in midlife and early old age," said Dr Singh-Manoux. "Once people are very old, it becomes more difficult to identify risk factors as the elderly tend to have higher levels of other illnesses and conditions; also dementia itself can affect the identification of risk factors as it involves changes in diet and metabolism. There is an increasing consensus on this life-long view of dementia – that events happening in earlier life can have an impact on whether or not dementia develops in older age."

(ends)

Notes:

[1] History of coronary heart disease and cognitive performance in midlife: the Whitehall II study. European Heart Journal. doi:10.1093/eurheartj/ehn298.

**A pdf of the full paper is available on request from Emma Mason or is available at:
http://www.oxfordjournals.org/our_journals/eurheartj/press_releases/freepdf/ehn298.pdf**

The European Heart Journal is the flagship journal of the European Society of Cardiology (<http://www.escardio.org>). Please acknowledge the journal as a source in any articles.

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