



Research report

Association between serum 25-hydroxyvitamin D and psychological health in older Chinese men in a cohort study

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ABSTRACT

Background: Few studies evaluated the association between vitamin D and psychological health in Chinese. This study examined these associations in Chinese older men in Hong Kong. **Methods:** Baseline serum 25-hydroxyvitamin D (25OHD), depression and cognitive function were assessed in 939 community-dwelling Chinese men aged >65. Data on depression status at 4-year follow up was available in 629 men. Data were collected for confounding factors: demographics, number of diseases, smoking, alcohol use, body mass index, physical activity, mobility limitations, dietary intake, season of blood measurement, and serum parathyroid hormone level. Multivariate logistic regression analyses were performed with adjustments for confounding factors.

Results: An inverse association between serum 25OHD and baseline depression was observed. Men in the highest (≥ 92 nmol/L) compared with lowest (≤ 63 nmol/L) quartile of serum 25OHD had an adjusted odds ratio for depression of 0.46 (95% CI: 0.22–0.98, $P_{\text{trend}} = 0.004$). The association was more pronounced in low vitamin D season than in high vitamin D season. No association was observed between serum 25OHD and incident depression at 4 years. Baseline cognitive impairment was not associated with serum 25OHD in all models.

Limitations: Self-reported measure of depression and cognitive performance, the small number of incident depression at 4-year follow up and selection bias may affect the study validity.

Conclusions: Serum 25OHD was inversely associated with depression at baseline and was not linked to baseline cognitive impairment and 4-year incident depression in Chinese older men. Future studies are warranted to evaluate these associations in populations with higher prevalence of vitamin D deficiency.

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1. Introduction

Psychological health is an important dimension to healthy ageing, in addition to physical health. Conditions of particular concern are cognitive impairment/dementia, and depression, the prevalence of which increases with age (Gurland and

Fogel, 1992; Jarvik et al., 1992). In recent years, there has been a growing interest in the association between blood 25-hydroxyvitamin D (25OHD) and cognitive impairment, and also between blood 25OHD and depression. Most studies have evaluated these associations in Caucasian populations (Annweiler et al., 2010; Hoogendijk et al., 2008; Llewellyn et al., 2010; Milaneschi et al., 2010) whose lifestyle differs from those of Chinese.

To our knowledge, only one study has examined the association between 25OHD and depressive symptoms in Chinese (Pan et al., 2009). In this population based cross

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sectional study, 3262 community residents aged 50–70 living in Beijing and Shanghai were included and depressive symptoms were defined as a Center for Epidemiological Studies of Depression Scale (CES-D) score of 16 or higher. The study showed no association between serum 25OHD and depressive symptoms. Regarding cognitive impairment, no study has been done to examine its association with serum 25OHD in Chinese.

The objective of this study was to examine the association between serum 25OHD and psychological health in Chinese older men living in Hong Kong at baseline and at the 4-year follow up.

2. Subjects and methods

2.1. Study population

The results of this paper were generated from part of the Os study in Hong Kong. The Os study was the first cohort study to examine the lifestyle and age-related diseases in Chinese elderly in Hong Kong. Two thousand Chinese community-dwelling men aged 65 years or over were recruited in a health survey between 2001 and 2003 through talks and recruitment notices in community centers for the older people and housing estates. The inclusion criteria were that all participants should be able to walk or take public transport to the study site. Subjects were volunteers, and the aim was to recruit a stratified sample so that approximately 33% would be in each of these age groups: 65–69, 70–74, 75+. Compared with the general population in this age group, participants had higher educational level (12–18% v. 3–9% with tertiary education in the age groups 80+, 75–79, 70–74, and 65–69 years) (Census and

Statistics Department, 2006). This study was approved by the Clinical Research Ethics Committee of the Chinese University of Hong Kong. Written informed consent was obtained from all subjects. A total of 988 men had baseline data on blood laboratory analysis. Data from 49 men were excluded in the analysis due to the supplemental use of multi-vitamins containing vitamin D or an extreme value of serum 25OHD or parathyroid hormone (PTH) level. The final sample included data from 939 men for baseline cognitive impairment analysis and 883 men for baseline depression analysis. For the longitudinal analysis, subjects who were depressed at baseline were excluded and 629 men were included for the 4-year incident depression analysis (Fig. 1).

2.2. The Questionnaires

A standardized interview was performed to collect information on age, education level, smoking status and alcohol use. Information on the duration and level of past and current use of cigarettes, cigars and pipes was obtained. Smoking history was classified in terms of former smoking (at least 100 cigarettes smoked in a lifetime), current smoking and never smoking. For alcohol consumption, subjects were asked to report their daily frequency of intake of alcohol and other beverages in portion sizes specified on the semi-quantitative food frequency questionnaire (FFQ). They were also asked to report on how many days of the week they consumed alcohol. Drinking status was defined as never, former or current drinker. Current drinkers were defined as those who drank at least 12 drinks of beer, wine (including Chinese wine) or liquor over the previous 12 months.

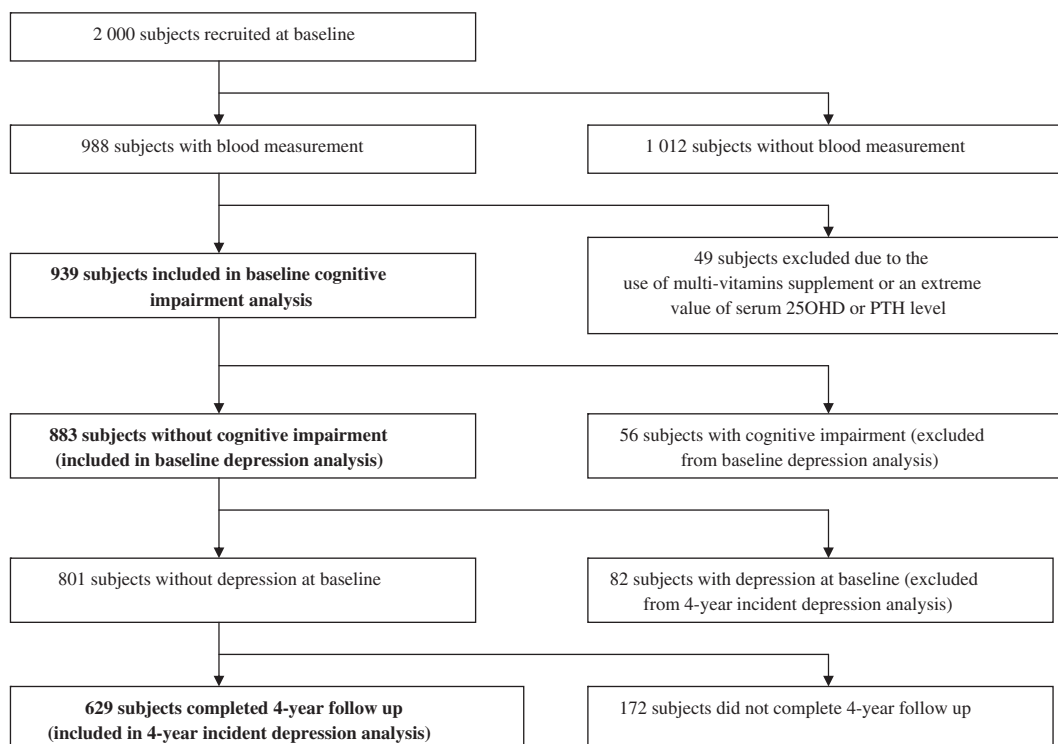


Fig. 1. Number of subjects included and excluded for baseline and 4-year follow up analyses.

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