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A possible association between paternal longevity and major depression among elderly men

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Abstract Ancestral longevity is sometimes thought to contribute to psychosocial well-being in late life. The present paper aims to examine if parental longevity is associated with mental health among the elderly. The age at death of the parents was compared between 68 patients with major depression who were aged 65 or over and 40 subjects of the same age range without any history of psychiatric disorder. Cox regression revealed that the fathers of the elderly men with unipolar depression died at a significantly younger age than those of the control group. Several hypotheses are advanced to explain this unexpected and intriguing association.

Key words aged, depressive disorder, geriatric psychiatry, parental longevity.

INTRODUCTION

Folk wisdom associates ancestral longevity with late-life psychosocial well-being. Vaillant examined this assumption in a prospective study of 184 college male students over half a century.[1] It was found that, although ancestral longevity predicted mortality at age 68 years, it exerted little effect in predicting psychosocial vigor and mental health at age 65.

While examining this influence of ancestral longevity, however, Vaillant *et al.* noted an unexpected association between affective disorder in the probands and age at death of their maternal grandfather: the mean age at death of maternal grandfathers for the depressed men was significantly younger than that for the other ancestors.[2]

Inspired by this intriguing finding, the present authors set out to examine the association between affective disorder and ancestral mortality in a case-control study of psychiatric patients and general population controls.

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SUBJECTS AND METHODS

The Group for Longitudinal Affective Disorders Study (GLADS) in Japan has been conducting a multicenter prospective follow-up study of a broad spectrum of affective disorders under the sponsorship of the Ministry of Health and Welfare.[3] In the first stage of the collaborative study we interviewed representative samples of psychiatric patients visiting the 31 participating centers, determined their psychiatric diagnoses according to DSM-III-R using a semi-structured interview called the Psychiatric Initial Screening for Affective disorders (PISA),[4] and collected data on age at death of their parents.

The 31 hospitals and clinics included psychiatric departments of 15 university hospitals, eight general hospitals, six mental hospitals and an outpatient clinic, and a psychosomatic department of a university hospital, from all over Japan. The methods of patient recruitment in the participating centers have been described elsewhere.[5]

The inter-rater reliability of the 33 psychopathological variables in the PISA has been reported to range between kappas of 0.71 and 1.00 (median: 0.85).[3] The inter-rater reliability of PISA diagnoses was 0.68 (95%CI: 0.51–0.86) for major depression, single episode, and 0.69 (95%CI: 0.52–0.87) for recurrent major depression. The PISA also contains a section inquiring

after each parent's current age if alive, or each parent's age and the patient's age when the parent died.

Control subjects was taken from a separate epidemiological study in a small city in Japan.[6] A total of 218 inhabitants was successfully contacted by lay interviewers trained in the use of a semi-structured psychiatric interview called the Time-Ordered Stress and Health Interview (TOSHI).[7] The inter-rater reliability (intraclass correlation) of the TOSHI, using case vignettes, was 0.75 for major depressive episode, 0.41 for dysthymia, 0.75 for manic episode, 0.60 for generalized anxiety disorder, 0.85 for panic disorder, 0.48 for phobic disorder and 0.64 for obsessive–compulsive disorder.[8] The section of the TOSHI dealing with parental death is identical to that of the PISA.

The subjects were limited to those of age 65 or older because we were interested in mental health in late life. As some of the parents of these subjects were expected to be alive at the time of the survey, we used Cox proportional hazards model of the SPSS statistical package,[9] treating such cases as censored in order to compare the age at death (survival) distribution of the parents between the cases and the controls. The log minus log plots were generated to check the proportional hazards assumption necessary for the model.

RESULTS

At the time of writing of this paper, the GLADS had administered the PISA to 2769 patients (1299 men and 1470 women), who were representative samples of first-visit patients to the 31 hospitals and clinics participating in this multicenter project. Of these 2769 patients, 203 (76 men and 127 women) were aged 65 or over, and relevant information concerning their parental death was available. Of these 203 patients, 68 subjects (17 men and 51 women) were diagnosed with major depression (single episode or recurrent). These 68 subjects constitute, therefore, the case group of the following analyses. The patients' mean age (±SD) was 70.7 (±3.1) for men and 71.0 (±4.9) for women. None of their depression was judged to be due to organic etiology or to substance use by the PISA interviewers. On average, their index depressive episode had lasted for 5.8 months (±10.0), when they made their first visit to the participating centers.

Out of the 218 interviewees (95 men and 123 women) of the epidemiological survey, seventy subjects were found to suffer from lifetime diagnoses of one or more DSM-III-R disorders and for a further 27 subjects, relevant information concerning parental death was lacking. Out of the remaining 121 healthy controls, in the following, data for the 40 subjects (20 men and 20 women) who were 65 years old or older are used. The controls' mean age (±SD) was 72.4 (±5.7) for men and 71.2 (±5.5) for women, and was not significantly different from that of the patients ($t = 1.03$, d.f. = 35, $P = 0.31$ for men and $t = 0.16$, d.f. = 69, $P = 0.87$ for women).

None of 108 fathers and nine (8.3%) out of the 108 mothers of the patients and the controls were still alive at the time of the investigation. The distribution of the age at death of the parents was compared separately for the men and women, because it appeared plausible to assume that death of a parent might have differential meaning for the subjects of the same or of the opposite sex (Table 1). The log minus log plots showed that the proportional hazards assumption was not violated for any of the comparisons made. Entering the age of the subjects as a covariate in the Cox regression model resulted in very similar estimates of relative risks, and the unadjusted values are reported here. The fathers of depressed men were 2.4 (95% confidence interval, 1.2–4.8; $P = 0.01$) times more likely to die early in comparison with the fathers of men with no psychiatric history. The mean age at death (±SD) of the fathers was 67.6 (±11.2) for the patients and 77.9 (±10.4) for the controls; the patients were 37.6 (±18.2) years old and the controls were 45.9 (±13.9) when their fathers died.

DISCUSSION

The present short report compared the age at death of the parents between patients with unipolar depression and healthy controls without lifetime psychiatric diagnoses, and found that the fathers of the elderly men with unipolar depression had died at a significantly younger age than those of the control group.

This finding is not a replication of that by Vaillant *et al.*,[2] because these authors found that the maternal grandfathers but not the other five ancestors of male probands with affective disorder had died younger than those of the controls.

Table 1. Relationship between major depression in old age and age at death of each parent for men and women according to Cox regression

Proband	Event	Relative risk	95% CI	*P*
Men	Father's death	2.4	1.2–4.8	0.01
	Mother's death	0.7	0.3–1.4	0.27
Women	Father's death	1.1	0.7–1.9	0.20
	Mother's death	0.6	0.4–1.1	0.11

Vaillant *et al.* proposed X-chromosome linkage as a possible explanation for the observed association.[2] Our findings of the younger age at death of the fathers of male affective disorder probands contradict the proposed X-chromosome linkage in male psychobiological vulnerability to affective spectrum disorder. It remains, however, possible that there may be some genetic linkage between early mortality in the fathers and depressive morbidity in the sons. A second possible explanation is a psychosocial one. On average, the fathers of the depressive elderly male patients died when the fathers were in their mid-60s and the sons were in the their mid-30s. On the other hand, the mothers of the depressive female patients died, on average, at the age of 78 (±15), when the daughters themselves were 50 (±15) years old. It is then likely that when the sons got older and faced problems associated with aging, they lacked appropriate role models and were, therefore, rendered vulnerable to depression. The female probands, on the contrary, were able to witness the process of aging of their mothers until their death near age 80.

The folk wisdom relating ancestral mortality with late-life psychosocial health was partly substantiated. In the future, the association between early parental death and unipolar depression in the elderly needs to be replicated in a separate sample, and a study into the possible mechanisms explaining the association will be called for.

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REFERENCES

1. Vaillant GE. The association of ancestral longevity with successful aging. *J. Gerontol. Psychol. Sci.* 1991; **46**: 292–298.
2. Vaillant GE, Roston D, McHugo GJ. An intriguing association between ancestral mortality and male affective disorder. *Arch. Gen. Psychiatry* 1992; **49**: 709–715.
3. Furukawa T, Takahashi K, Kitamura T *et al.* The Comprehensive Assessment List for Affective Disorders (COALA): A polydiagnostic, comprehensive, and serial semistructured interview system for affective and related disorders. *Acta Psychiatr. Scand. Suppl.* 1995; **387**: 1–36.
4. Kitamura T. *Psychiatric Initial Screening for Affective disorders (PISA).* National Institute of Mental Health, National Center for Neurology and Psychiatry, Ichikawa, 1992 (in Japanese).
5. Furukawa T, Harai H, Hirai T, Fujihara S, Kitamura T, Takahashi K. Childhood parental loss and alcohol dependence among Japanese men: A case-control study. *Acta Psychiatr. Scand.* (in press).
6. Aoki Y, Fujihara S, Kitamura T. Panic attacks and panic disorder in a Japanese non-patient population: Epidemiology and psychosocial correlates. *J. Affect. Disord.* 1994; **32**: 51–59.
7. Kitamura T. *Manual of the Time-Ordered Stress and Health Interview.* National Institute of Mental Health, National Center for Neurology and Psychiatry, Ichikawa, 1992 (in Japanese).
8. Kawakami N, Iwata N, Tanigawa T *et al.* Prevalence of mood and anxiety disorders in a working population in Japan. *J. Occup. Environ. Med.* 1996; **38**: 899–905.
9. SPSS Inc. *SPSS Advanced Statistics 7.5.* SPSS Inc., Chicago, 1997.