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【Original Article】

Reference Values of the Maximal Oxygen Uptake on "Exercise and Physical Activity Reference for Health Promotion 2006" and Mortality: A Cohort Study among Japanese Male Workers

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Abstract

Purpose: In 2006, the Ministry of Health, Labour and Welfare published "Exercise and Physical Activity Reference for Health Promotion 2006". This report showed reference values and ranges of the maximal oxygen uptake for health promotion. However, there are no epidemiological studies that have investigated the relationship between these values and ranges in relation to mortality. Therefore, we assessed the existing data of our cohort study among Japanese male workers.

Methods: Subjects were 8,935 Japanese male workers. The median age was 35 years old (IQR: 29 to 43). The maximum oxygen uptake was estimated using a submaximal cycle ergometer test between 1982 and 1988. The men were classified into four groups based on the reference values and ranges, the below the range group (Group I), the bottom of the range to below the reference value group (Group II), the reference value to the upper range group (Group III), and the over the range group (Group IV). We investigated mortality until June 30, 2003. We used the proportional hazards model in order to obtain the relative risks (RR) for mortality across each group. Multivariate RR and 95% confidence intervals (95% CI) for mortality were obtained while adjusting for age, systolic blood pressure, cigarette smoking, and alcohol intake.

Results: There were 360 deaths during the follow-up period. Using Group I as reference, the RR and 95% CI for Group II to Group IV were 0.76 (0.58-0.99), 0.59 (0.43-0.80), and 0.80 (0.49-1.31), respectively (p for trend = 0.009).

Conclusion: These findings suggest that Japanese male workers in the upper range of the reference values of maximal oxygen uptake for health promotion have a lower RR of mortality.

Key words: exercise test, maximal oxygen uptake, epidemiology, relative risk, Exercise and Physical Activity Reference for Health Promotion 2006

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