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Exercise responses and psychiatric disorder in chronic fatigue syndrome

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Fatigue, exercise intolerance, and myalgia are cardinal symptoms of the chronic fatigue syndrome, but whether they reflect neuromuscular dysfunction or are a manifestation of depression or other psychiatric or psychological disorders diagnosed in a high proportion of fatigued patients in the community is unclear.¹ In previous studies patients with the chronic fatigue syndrome showed exercise intolerance in incremental exercise tests, which seemed to be related to an increased perception of effort; also, blood lactate concentrations in some patients tended to increase more rapidly than normal at low work rates, implying inefficient aerobic muscle metabolism.² We examined venous blood lactate responses to exercise at a work rate below the anaerobic threshold in relation to psychiatric disorder.

Patients, methods, and results

We studied 96 consecutive patients meeting the Oxford criteria for diagnosis of the chronic fatigue syndrome³ by using the subanaerobic threshold exercise test.⁴ Subjects pedalled an electronically braked bicycle ergometer for 15 minutes at 90% of the predicted work rate at their anaerobic threshold, based on age, weight, and sex; venous blood lactate concentrations were measured before, immediately after, and 30 minutes after exercise. Continuous electrocardiographic monitoring allowed measurement of mean heart rate during exercise. An abnormal result was defined as lactate concentrations exceeding the upper 99% reference limit for normal control subjects⁴ at two or more time points. We screened a convenience sample of 43 of the 96 patients using 11 established neuropsychological and psychiatric instruments, including the present state examination, for assessment of psychiatric caseness and prediction of psychiatric diagnoses.⁵

The study group comprised 41 men and 55 women of similar age range. Duration of symptoms ranged

from six months to 20 years (mean 43.5 (SD 11.6) months). All patients were ambulant.

Thirty one (12 men, 19 women) of the 96 patients (32%) had abnormal lactate responses to exercise (subanaerobic threshold exercise test positive). These patients did not differ significantly from those with normal lactate responses in age, sex, or duration of symptoms. Twenty nine patients (30%) had mean heart rates above the predicted upper 95% reference limit for normal controls.⁴ However, there was no significant difference between the proportions with abnormal heart rates among those with abnormal or normal lactate responses (7/31 v 22/63 (no data in two cases); odds ratio 0.54 (95% confidence interval 0.2 to 1.46)).

The 43 patients studied by psychological and psychiatric tests did not differ significantly from the 53 other patients in terms of age (mean 34.6 v 34.4 years); mean duration of symptoms (43.6 v 37.1 months); sex distribution (19 men v 24 men); whether they were working (27 unemployed v 27 unemployed (not recorded in two cases)); or proportion with abnormal lactate responses (15/43 v 16/53). Eighteen of the 43 (42%) patients fulfilled criteria for psychiatric caseness. Diagnoses were neurotic depression (12 patients), manic depression (3), phobic anxiety (2), and anxiety state (1). Patients with normal lactate responses were more likely to fulfil criteria for psychiatric caseness than those with abnormal lactate responses (15/28 v 3/15; odds ratio 4.6 (1.06 to 20.1)).

Comment

Patients with symptoms that precluded or severely restricted physical activity might be expected to show increased lactate responses to exercise as a result of "deconditioning." However, abnormal lactate responses were seen in only a third of our cases, and we found no relation between lactate responses and duration of symptoms or any other demographic variable. Furthermore, although 30% of all patients had abnormally high heart rates during exercise, a high heart rate was as common in patients with normal lactate responses as it was in those with abnormal responses. Patients with the chronic fatigue syndrome who also had psychiatric disorders such as depression, which is commonly associated with fatigue and inactivity, might also be expected to be unfit and to have abnormal exercise results; but the converse proved to be true.

Our results suggest that some patients with the chronic fatigue syndrome have impaired muscle

energy metabolism that is not readily explained by physical inactivity or psychiatric disorder. This adds to the growing body of evidence that the syndrome is heterogeneous.

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Conflict of interest: None.

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Incidence of HIV infection in homosexual men in London, 1988-94

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Measures of the incidence of HIV infection in different groups are essential for targeting and evaluating health education. Incidence measures obtained by the follow up of closed cohorts become biased over time as early infection in those at highest risk results in a subsequent downward trend in incidence.^{1,2} We describe changes in the age specific incidence of HIV infection in open cohorts of homosexual men continuously recruited from among patients attending genitourinary medicine clinics in London from 1988 to 1994.

Patients, methods, and results

Homosexual men negative for HIV antibody who had attended genitourinary medicine clinics in London from January 1988 to April 1994 and been voluntarily retested for HIV antibody were identified from computerised records held by four laboratories participating in a Public Health Laboratory Service collaborative survey.³ Person time denominators were obtained by summing the time between the first and last test giving negative results for those remaining antibody negative and the time between the first negative and first positive result for those who became positive for HIV antibody. Incidence estimates over time and between age groups were compared with the Poisson likelihood ratio test.

A total of 6753 homosexual men were identified as being negative for HIV antibody, of whom 1759 (26%) had one or more repeat tests during the study period. The proportion retested was similar in each age group and did not vary significantly over time. The overall mean time between the first and last test was 676 days. A total of 124 men became positive for HIV antibody, 84 (68%) of whom were aged under 30. The overall incidence was 3.8 per 100 person years (95% confidence interval 3.2 to 4.5). The rate was highest in men aged 20-24 (6.2 per 100 person years) and declined significantly with age to 1.6 in men aged 40 and over ($P < 0.001$).

Sixty nine of the 1418 men who had repeat tests within two consecutive calendar years became positive

for HIV antibody. Incidence remained at around 9 per 100 person years among the younger men (under 30), with no evidence of a downward trend over time ($P > 0.5$) (table). Incidence was significantly lower in older men ($P = 0.03$), averaging 3.3 per 100 person years; the decline over the period in this group was not significant ($P = 0.10$).

Comment

Our study illustrates the value of the open cohort method applied to data obtained from voluntary HIV antibody testing for monitoring incidence in groups at high behavioural risk.¹ The difference in incidence with age found in homosexual men is unlikely to result from bias in selection for retesting as the proportion with repeat samples was similar across and within age groups over time.

The continuing high incidence of HIV infection in young homosexual men in London is worrying. Behavioural studies that will identify the factors leading to unsafe sexual behaviour in this group are urgently needed. Although the high incidence measured in our study cohort probably does not apply to all homosexual men, the identification of a subgroup at high risk of infection is important because targeting interventions at this subgroup could have a substantial effect on reducing the rate of transmission overall. If candidate HIV vaccines become available, young homosexual men attending genitourinary medicine clinics in London could be a suitable population in which to measure efficacy.

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Corrections

Delays in hospital admission and investigation in acute stroke

An authors' error occurred in the figure illustrating this short report by Neil E Anderson, Joanna B Broad, and Ruth Bonita (15 July, p 162). The median time to delay for intracerebral haemorrhage should be 14 hours, not seven as shown, and the median delay for cerebral ischaemia was as high as 66 hours (not 48 hours). The text gives the correct values.

Changing patterns of iron deficiency anaemia in the second year of life

An editorial error occurred in this short report by John A James and colleagues (22 July, p 230). In the table the risk of anaemia at 2 years of age in children who were anaemic at 14 months (fourth row) should have read 30% (13/43) [not 30% (30/43)].

Incidence of HIV infection in HIV negative homosexual men by age and over time

	Age <30				Age ≥30			
	No retested	Mean time between tests (days)	No becoming HIV positive	Incidence of HIV infection per 100 person years	No retested	Mean time between tests (days)	No becoming HIV positive	Incidence of HIV infection per 100 person years
Jan 1988-Dec 1989	131	259	7	7.5	236	303	10	5.1
Jan 1990-Dec 1991	254	295	20	9.7	262	318	8	3.5
Jan 1992-April 1994	247	313	19	8.9	288	336	5	1.9