Short report

Endocrinological responses in cluster headache

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SUMMARY Growth hormone and prolactin levels and their response to various stimuli were studied in patients with cluster headache. All the endocrine responses evaluated were normal.

Cluster headache is well-defined in its symptoms, but its pathophysiology remains obscure.¹ Its cyclic pattern has suggested a comparison with the manic depressive syndrome with which it may share some treatments.¹ We used endocrinological parameters, that is, growth hormone and prolactin responses to several stimuli, in order to investigate further the role of neurotransmitters in the pathophysiology of cluster headache and to see whether the abnormal endocrinological responses of depressed patients were present also in those with cluster headache.

Methods

Ten male subjects, 30-45 years of age, within 10% of their ideal weight, suffering with cluster headache for at least five years, and ten age- and sex-matched normal subjects participated in the study after one month free of any medication. All patients volunteered after the nature of drugs and the experimental protocol had been explained. The following treatments were applied: saline infusion; insulin tolerance test with insulin, 0.1 IU/kg iv; thyrotropin releasing hormone (Abbott, Rome, Italy) 400 µg iv; levodopa (Larodopa, Hoffman La Roche, Milano, Italy) 500 mg by mouth. The order of treatments was randomised. Growth hormone and prolactin were evaluated by radioimmunoassay with reagents kindly provided by Dr HG Friesen (Winnipeg, Canada) using procedures previously described.² Statistical evaluation was performed by analysis of variance and paired Student *t* test.

Results

The basal growth hormone and prolactin concentrations were similar in normal subjects and in clus-

ter headache patients. Moreover, panels A-F in the figure show that cluster headache patients behaved like normal subjects as far as growth hormone and prolactin responses to the insulin tolerance test, levodopa, or thyrotropin releasing hormone are concerned.

Discussion

Several endocrinological responses are abnormal in depressed patients. In these subjects both levodopa and the insulin tolerance test provoke a subnormal growth hormone response,^{3,4} and thyrotropin releasing hormone can induce a growth hormone response different from that observed in normal subjects.⁵ Our results indicated that, in contrast to depressed subjects, cluster headache patients showed a normal behaviour of the endocrinological parameters we investigated. This might mean that pathophysiology of depression and cluster headache are different, although both diseases have some clinical features in common such as the cyclic presentation and benefit from similar therapy such as lithium. Further, our data seem to indicate that the pathology underlying cluster headache does not involve central neurotransmitters like 5-HT, histamine, dopamine or noradrenaline which are all at least partially involved in the hormonal responses we tested.⁶⁻⁹ The normal growth hormone response to thyrotropin releasing hormone (which is a lack of growth hormone increase), indicates that the whole hypothalamic regulation of pituitary secretion is intact. Abnormal growth hormone responses to this releasing hormone seem to be present only when a deranged control of the whole hypothalamic-pituitary regulation is present.¹⁰⁻¹³ From these results it is suggested that the pathology underlying cluster headache has to be sought outside the central nervous system, namely in the peripheral malfunction.

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Fig Growth hormone and prolactin responses in normal subjects (●—●) and cluster headache patients (■—■) to the insulin tolerance test (A, B); levodopa (C, D); and thyrotropin releasing hormone (E, F). Vertical bars represent the SEM.

tioning of neurotransmitters or receptors, as has been suggested by others.¹⁴

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