

Coital cephalgia and ischaemic muscular work of the lower limbs

H. P. STAUNTON AND J. MOORE

From the Department of Neurology, Richmond Hospital, Dublin, Ireland

SUMMARY A case is reported of a patient who presented with coital cephalgia, and in whom an obstructive lesion of the lower aorta was demonstrated. Bicycle ergometry evoked an abnormal pressor response. The condition was cured by restoration of normal circulation. An abnormal pressor response to treadmill exercise was shown to exist in subjects with intermittent claudication, and in normal subjects with circulation to lower limbs artificially occluded. A pressor response to buttock or leg exercise or both is suggested as the cause of the coital cephalgia.

The term coital cephalgia denotes a well-recognised phenomenon (Kriz, 1970; Paulson and Klawans, 1973; Lundberg and Osterman, 1974; Martin, 1974). An arbitrary definition might be an excruciatingly severe headache occurring during sexual intercourse. Its time of onset is usually, but not necessarily, at the climax. The severity of the pain can be sufficient to lead to immediate hospital admission and cerebrospinal fluid examination. Subarachnoid haemorrhage can indeed present in this way—in one series of 50 cases, 12% did so (Lundberg and Osterman, 1974). There is a general tendency to regard it as a benign phenomenon when it is not indicative of a subarachnoid haemorrhage (Paulson and Klawans, 1973; Lundberg and Osterman, 1974; Martin, 1974). Some authors have raised the possibility of a severe rise in arterial blood pressure as a factor (Kriz, 1970; Lance, 1976) but without proof in a specific case.

We present here a case in which a definite cause was found—namely an occlusive lesion of the lower aorta—and the probable pathophysiological link identified as a pressor response to lower limb exercise. Experimental observations on the circulatory effects of ischaemic muscular work of the lower extremities, in both normal subjects and in those with intermittent claudication, are also described, and an attempt made to correlate the findings.

Address for reprint requests: Dr H. P. Staunton, Department of Neurology, Richmond Hospital, Dublin 7, Ireland.

Accepted 22 May 1978

Subjects and methods

One case is reported in whom blood pressure was measured before, during, and after bicycle ergometry.

Observations on blood pressure were also made on two subjects with intermittent claudication before, during, and after treadmill exercise. A 48 year old man (JB) had stenosis of the left superior gluteal artery which was demonstrated angiographically. He complained of claudicating pain of the left buttock. A 60 year old woman (SM) had hypertension of moderate degree (diastolic pressure varied between 100 and 115 mmHg), and had claudicating pain of both calves. She was not on antihypertensive treatment. Finally, observations were made on two normal male subjects (WB and BL) during treadmill exercise, both with free circulation and with inflated occlusive cuffs over both upper thighs. Systemic arterial pressure was recorded through a nylon catheter which was introduced into the brachial artery by a Seldinger technique. Pressure was transduced by a Statham strain gauge manometer.

Case report

A 42 year old ex-paratrooper presented at an outpatient session, complaining of the recent onset of excruciating headaches which occurred at the climax of sexual intercourse. On later questioning he admitted to pain in the left buttock at about 200 yards walking exercise. There was no other rele-

vant history. Clinical examination revealed the following positive findings: the left radial pulse was both delayed and diminished in volume; blood pressure in the right arm was 160/90 mmHg, and in the left arm 110/95 mmHg; both femoral pulses were delayed, and all other leg pulses absent, excepting the left posterior tibial. Urinalysis, blood count, sedimentation rate, blood urea and electrolytes, fasting blood sugar, total fasting cholesterol and triglycerides, and lipoprotein electrophoretic pattern were all normal. Blood Reiter and Kahn tests were negative. The electrocardiogram was normal. Chest and skull radiographs were normal. Aortography revealed two lesions: there was complete occlusion of the proximal part of the left subclavian artery, and total occlusion of the abdominal aorta a few centimetres below the origin of the renal vessels (Fig. 1). Exploration (Professor W. A. L. McGowan) confirmed the latter occlusion. An aorto-iliac bypass dacron prosthesis was inserted. The subclavian artery was not explored. The patient made an uneventful recovery and returned to a normal sexual life without headache. He remains symptom-free 14 months later. At no stage, either before or after surgery, had he been totally or partially impotent.

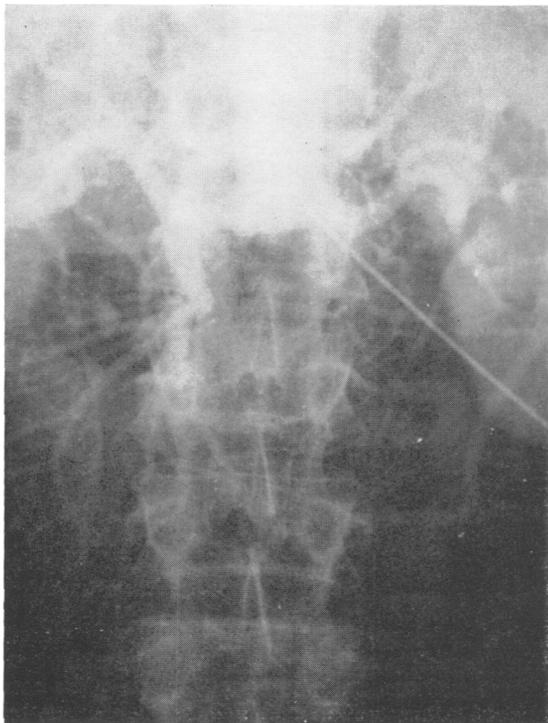


Fig. 1 Radiograph demonstrating complete aortic occlusion below the origin of the renal vessels.

Results of dynamic studies

Figure 2 illustrates the response of pulse rate and mean blood pressure, in the subject described above, to a moderate level of bicycle ergometry. The exercise was stopped after three minutes because of the very large rise in pressure (to 255/130 mmHg). He had not complained of claudicating pain, but did complain of severe headache.

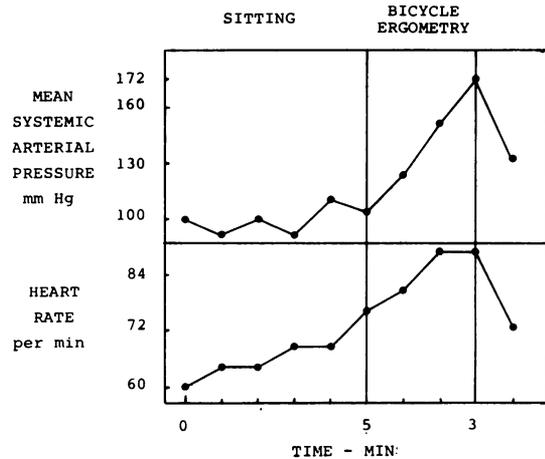


Fig. 2 Effect of bicycle ergometry on blood pressure and heart rate in subject with total aortic occlusion.

Figure 3 shows the significant rise in blood pressure which occurred during treadmill exercise in the two subjects with intermittent claudication.

Figure 4 illustrates the rise in blood pressure which occurs during treadmill exercise at two different work levels, in two normal subjects, when the circulation to both lower limbs is occluded.

Discussion

Blood flow to the buttocks and legs was the only parameter changed in order to effect a cure in our patient. The relationship between buttock and/or leg ischaemia on the one hand, and the headaches on sexual intercourse on the other, seems inescapable. It appears likely that a large rise in blood pressure is the link factor, and the levels reached on bicycle ergometry are of the order seen in those cases of headache produced by the hypertensive crisis caused by the interaction of tyramine and monoamine oxidase inhibitors (Blackwell, 1963).

Ischaemic muscular work brings about significant elevation in blood pressure (Alam and Smirk, 1937), and the degree of elevation is directly related to the degree of ischaemia (Staunton *et al.*,

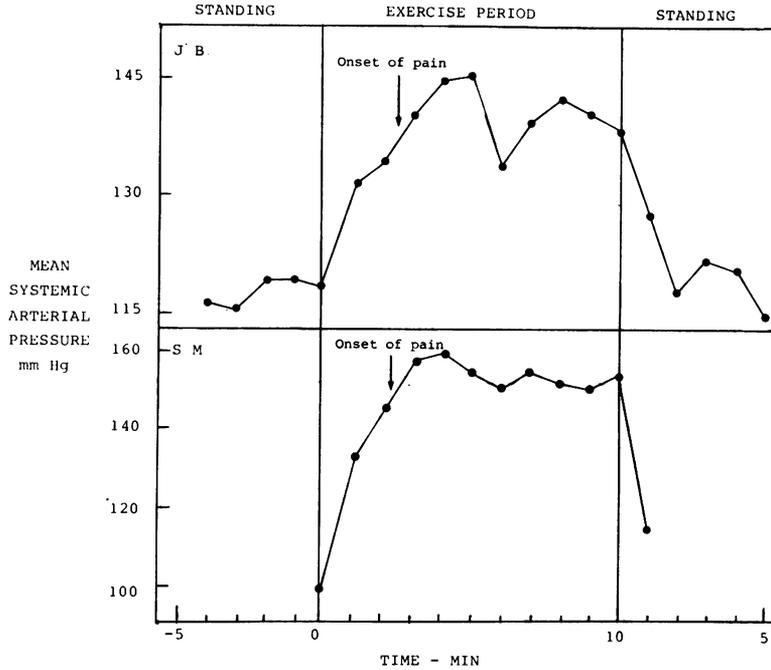


Fig. 3 Effect of treadmill exercise on blood pressure in two subjects with intermittent claudication.

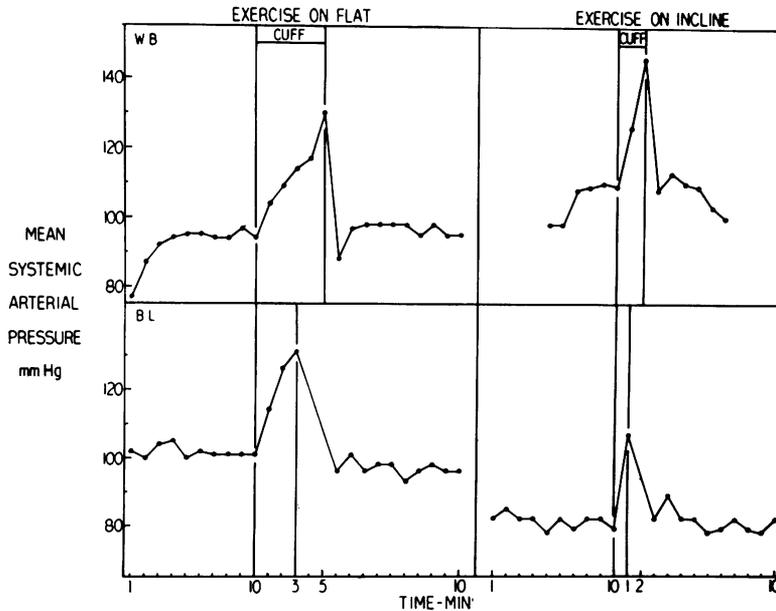


Fig. 4 Effect of vascular occlusion to both lower limbs on systemic arterial pressure during treadmill exercise in two normal subjects.

1964; Staunton, 1966). This response is reflex in nature (Staunton, 1966), and its possible functional role anticipated in the teleological term "nutrition reflex" (McDowall, 1956). The physiological basis for the blood pressure changes during bicycle ergometry described above is, therefore, not specu-

lative, and is understood to a considerable extent. The possibility of such conditions as Leriche syndrome and coarctation should, therefore, be considered when coital cephalgia is the presenting symptom, and particular care should be taken in advising the patient about exercise.

It is clear, however, that an obstructive lesion of the aorta is an exceptional cause of coital cephalgia. The frequency of migraine as a background condition (Paulson and Klawans, 1973; Lundberg and Osterman, 1974; Martin, 1974) would suggest that the two conditions are causally related in some cases. Further, one such case with intractable migraine experienced the classical syndrome during the initial excitement phase, preventing participation in the act. The question arises as to whether raised blood pressure is a pathogenetic factor in the so-called "benign" coital cephalgia. Static muscular contraction is a potent pressor stimulus, the mechanism being similar to that in ischaemic muscular work (Lindhard, 1920; Lind *et al.*, 1964; Staunton *et al.*, 1964). Although rises in blood pressure are only moderate during intercourse (Masters and Johnson, 1966), the isometric muscular work required for the maintenance of the coital position on the part of the male, particularly during the myotonic phase close to and at orgasm, may be at times a significant adjunct to the central and humoral pressor influences. This myotonic phase occurs in both sexes (Masters and Johnson, 1966). Significantly, it also occurs during masturbation when a similar headache may occur (Lance, 1976).

References

- Alam, M., and Smirk, F. H. (1937). Observations in man upon a blood pressure raising reflex arising from the voluntary muscles. *Journal of Physiology*, **89**, 372–383.
- Blackwell, B. (1963). Hypertensive crisis due to monoamine-oxidase inhibitors. *Lancet*, **2**, 849–851.
- Kriz, K. (1970). Koitus jako cinitel pri vzniku neurologických komplikaci. *Československá Neurologie*, **33**, 3, 162–167.
- Lance, J. W. (1976). Headaches related to sexual activity. *Journal of Neurology, Neurosurgery, and Psychiatry*, **39**, 1226–1230.
- Lind, A. R., Taylor, S. H., Humphreys, P. W., Kennelly, B., and Donald, K. W. (1964). Circulatory effects of sustained voluntary muscle contraction. *Clinical Science*, **27**, 229–244.
- Lindhard, J. (1920). Untersuchungen über statische Muskelarbeit. *Skandinavisches Archiv für Physiologie*, **40**, 145–196.
- Lundberg, P. O., and Osterman, P. O. (1974). The benign and malignant forms of orgasmic cephalgia. *Headache*, **14**, 164–165.
- Martin, E. A. (1974). Headache during sexual intercourse (coital cephalgia). A report on six cases. *Irish Journal of Medical Science*, **148**, 342–345.
- Masters, W. H., and Johnson, V. E. (1966). *Human Sexual Response*. Little, Brown and Co: Boston.
- McDowall, R. J. S. (1956). *The Control of Circulation of the Blood*, p. 89. William Dawson and Sons: London.
- Paulson, G. W., and Klawans, H. L. (1973). Benign orgasmic headache. *Transactions of the American Neurological Association*, **98**, 295–297.
- Staunton, H. P. (1966). *Circulatory responses to static muscular exercise with observations on their reflex nature*. PhD Thesis, University of Edinburgh.
- Staunton, H. P., Taylor, S. H., and Donald, K. W. (1964). The effect of vascular occlusion on the pressor response to static muscular work. *Clinical Science*, **27**, 283–291.