may give low hybridisation levels. Hence, the test should be used only as a screening procedure, and not for purposes of definitive diagnosis of X and Y chromosome aberrations.

Compared with fetal sex determination by chromosome analysis, the method described here can yield results in 2 to 3 days instead of 2 to 3 weeks. Thus any additional diagnostic studies and genetic counselling can be initiated much earlier in pregnancy. Preliminary data indicate that chorionic villi can also be used for sex determination with the dot blot procedure.[16] We are now devising a nonradioactive method for labelling the probe. Such improvements should greatly facilitate early antenatal diagnosis of X-linked genetic disorders.

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SUBCUTANEOUS HORMONE IMPLANTS FOR THE CONTROL OF CLIMACTERIC SYMPTOMS

A Prospective Study

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Summary 55 postmenopausal women on established hormone replacement therapy were treated with either oestradiol and testosterone implants or placebo at the time of return of climacteric symptoms. Their response to therapy was assessed prospectively. The statistically highly significant levels of symptom relief that followed an oestradiol and testoserone implant were contrasted sharply with the lack of any significant relief with placebo. Despite the success of oestradiol and testosterone implants in relieving symptoms of the climacteric, symptoms returned once the treatment was stopped. Evidence is presented that it is the fall in hormone levels rather than the level itself that provokes the return of climacteric symptoms.

Introduction

THE use of subcutaneous implants as an alternative route of oestrogen administration in the climacteric was pioneered by Greenblatt.[1] Implants bypass the intestine, avoiding the first-pass effect on liver metabolism of the hormone. This prevents the unphysiological ratio of oestradiol to oestrone found with oral preparations.[2] Oral preparations, unlike implants, also reduce liver metabolism of clotting factors and lipids.[3]

Although interest in implant therapy is increasing, it has still not gained the acceptance of oral therapy and very little prospective work has been done on this route of administration. Implantation is a simple outpatient procedure carried out under local anaesthesia, and it is normally repeated every 6 months.[4] Our policy is to insert a pellet of testosterone 100 mg (T) in addition to a pellet of oestradiol 50 mg (E) in women who complain of coexistent lethargy, depression, and loss of libido.

The few side-effects of E+T implant therapy have been described elsewhere.[5] An unexpected finding was that when the symptoms returned after 4 to 6 months, the oestradiol and testosterone levels had fallen only to within the normal premenopausal range. It was therefore considered necessary to compare the effects of placebo treatment on these patients at the time of return of climacteric symptoms.

Patients and Methods

55 postmenopausal women were recruited from the Dulwich menopause clinic. All were regular attenders at the clinic and had previously received implants that gave them good relief from their climacteric symptoms (table I).

Patients were randomly divided into two groups depending on their hospital number. Those with an even case sheet number were given E+T, and those with an odd number were given placebo. Norethisterone 5 mg daily for 7 days each cycle was given to all patients with a uterus to prevent endometrial hyperplasia.[2,6,7]

There was no significant difference in the average age and weight between the two groups (table II). Patients were not aware of which implant they were receiving. They were asked to score a symptom list using a five-point scale. They were then followed up at 2-month intervals for 8 months. The symptoms assessment sheet was

TABLE I—IMPLANT HISTORY OF STUDY POPULATION

—	Mean±SEM
No of implants per patient	6·0±0·4
Duration of treatment	32·9±2·3 mo
Start of appreciable benefit	2·1±0·1 wk
Maximum benefit	5·2±0·4 wk
Start of decline	2·5±0·3 mo
Implant wore off	6·4±0·2 mo

The rate at which an implant wears off can also be deduced. The active period has been described as being 6 months, and this figure corresponds to that given to us retrospectively by our patients (table I). However, prospectively at 4 months, in our series of patients on E+T, the improvement in the urethral syndrome loses its significance. By 6 months, a total of six symptoms lose their statistical significance, when compared to the severity of symptoms at month 0. In addition, the overall improvement of the total sum of all symptoms loses its significance.

On this information, a case could be made for offering a repeat E+T implant every 4 months instead of every 6 months.

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Methods and Devices

PORTABLE CHAIR FOR TESTING ISOMETRIC MUSCLE STRENGTH

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Introduction

TESTING of voluntary muscle strength has long been part of routine physical examination. Clinicians still have to rely, however, on subjective assessment of skeletal muscle power, since no generally accepted method for quantifying muscle strength is presently available for clinical use. Hand-held dynamometers for measurement of grip strength are of limited value, since many muscle disorders disproportionately affect proximal muscles.[1,2] We have developed a portable chair which is especially suited to testing muscle strength in clinical practice. The chair is based on experimental equipment designed to test quadriceps muscle function,[2] but it incorporates several modifications and improvements. It is portable and, using a single load cell, allows measurement of three muscle functions, including both proximal and distal muscle groups. All the components used are readily available.

Materials and Methods

The chair was designed to meet the following requirements:

1. A choice of two separate load ranges (0–10 kg and 0–100 kg) each with an overall accuracy of measurement to within ±2% and a negligible temperature coefficient.
2. Readily changeable between mains and battery operation (with an indication of state of charge of the internal battery).
3. Digital readout of force, with retention of peak force reading and manual reset of peak reading.
4. Facility to drive an analogue meter (with retention of peak reading) to assist patient motivation, and an analogue pen recorder to give the profile of the force/time curve.
5. Built-in calibration checks of system sensitivity.

These requirements were met by the digital strain gauge monitor 'SGA 800 Mk2' (CIL Electronics, Worthing) modified by the manufacturers so that the load range could be selected by a switch. Additional circuitry was provided to protect the analogue meter in case the operator inadvertently changed to the more sensitive scale while the meter was under full deflection on the upper range. The load cell used was model F241 A2T (Novatech Measurements Ltd, St Leonards on Sea) with a range 0–200 kg. The basic chair frame was an adapted physiotherapy quadriceps exercise chair (model Z1079, Nomeq Medical Equipment, Nottingham). The weights were discarded, and arm rests, lockable wheels, and a standard car-type lap seat belt attached (fig 1).

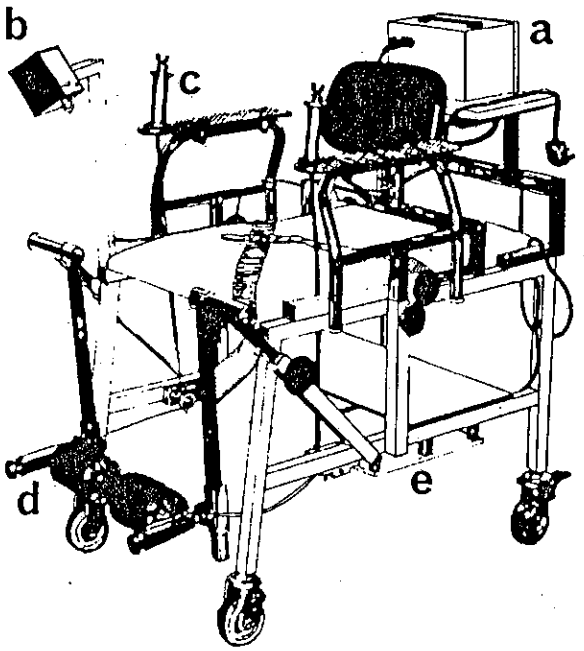

Fig 1—The portable chair.

a = digital monitor; b = patient visual display meter; c = handgrip; d = ankle pad; e = load cell.

The maximum load expected from the quadriceps in healthy adult subjects was under 100 kg.[1] To make full use of the range of the load cell (0–200 kg) it was stressed by way of a 2/1 lever system which enabled both left and right limbs to be tested. The load cell was positioned centrally to the force lever, which was contained by an open pivot at each end. Both were mounted on a ¼ inch Duval plate fixed to the chair frame. For measurement of quadriceps strength, thrust transmitted from the ankle pads is carried by a $\frac{1}{16}$ inch Bowden cable to the force lever. To measure upper arm and hand grip strength, a second cable was fixed on each side to the original cable and connected by way of a pulley to the handgrips. These were constructed with two pins passing through the base (so that they pressed directly on the arm rests) and were mounted in a floating ball joint to counter any side flexing in use.

The unit was calibrated by means of a high-quality spring balance connected directly to the ankle pad or handgrip, and the bridge balance unit was adjusted to ensure that the digital meter reading was within 2% of that of the spring balance. The calibration was checked initially once a month.