

acne. Neither the severity of the acne nor the rate of excretion of sebum was measured, but the controls were well matched. Nevertheless, 10 patients had irregular menstrual periods and 12 had hirsuties, which may suggest that many of these 38 patients had clinical evidence of abnormal androgen function.

The clear message is that we do not fully understand why patients with acne do have an increased sebum excretion rate; more basic research is needed. We do know, however, that a substantial fall in the rate of excretion of sebum is always associated with improvement in the acne. How much the secretion of sebum must be suppressed to produce clinical improvement is uncertain, but a reduction of 35% or more is probably needed to produce a satisfactory clinical response.

An oral contraceptive pill containing either 20 or 30 μg of oestrogen usually has no real effect on the woman's acne. A contraceptive pill with 50 μg of oestrogen will reduce the rate of excretion of sebum by 40%, and this is usually associated with clinical improvement.¹² The combination of ethinyl-oestradiol 50 μg with prednisone 5 mg (the latter taken at night to obtain maximum adrenal suppression) will reduce the rate by up to half, with clinical improvement in almost all cases.¹³

The most potent combination of all is probably ethinyl-oestradiol 50 μg and the antiandrogen cyproterone acetate (2 or 100 mg), which will reduce production of sebum by 50-75%. The treatment is given in the reverse sequential manner¹⁴—that is, the oestrogen is taken from the fifth to the 25th day and the antiandrogen from the fifth to the 14th day. Considerable improvement in the acne may be expected with this regimen, but (as with all the hormonal regimens) not until about the sixth week of treatment. The production of sebum may also be reduced by up to 90% without hormonal treatment: oral 13-*cis*-retinoic acid, which affects sebaceous gland differentiation, is most effective in treating patients with antibiotic-resistant acne.¹⁵

No successful topical antiseborrhoeic treatment is available; several formulations have been tried without effect. Their failure may be due either to poor percutaneous absorption or to a metabolite of the antiandrogen being required to mediate the desired effect. Alternatively, the plasma concentration of androgen reaching the sebaceous gland may easily overwhelm the local antiandrogen effect.

In practical terms, which patients should be considered for hormonal treatment? The answer is only those who fail to respond to adequate conventional treatment, since it has fewer side effects than treatment with either hormones or retinoids. Conventional treatment means a minimum of 1 g a day of oral tetracycline or erythromycin together with topical preparations such as benzoyl peroxide given for a minimum of four to six months.

Only a few patients with acne—about 2-5%—will need to be considered for treatment with hormones or retinoids. 13-*Cis*-retinoic acid, now available on a named-patient basis, may be used in both sexes, whereas hormonal treatment is usually indicated only for women. Should a patient with acne not respond well to conventional treatment after three to four months and already be taking the contraceptive pill, then (if there are no contraindications) its ethinyl-oestradiol content should be increased to 50 μg . If after a further three months there is no response, or if the patient is not already taking the contraceptive pill, a hormone combination should be prescribed: either 50 μg ethinyl-oestradiol and 5 mg oral prednisone or the ethinyl-oestradiol-cyproterone acetate combination, which is now available in a twin pack.

Finally, we need to remember that comparative studies of

these three regimens—conventional treatment, hormones, or retinoids—have not been reported; until these have been performed absolutely reliable therapeutic guidelines cannot be given.

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Deaths after intravenous regional anaesthesia

Since 1979 the Scientific and Technical Branch of the DHSS has been informed of five deaths resulting directly from the use of intravenous regional analgesia. The technique, originated by Bier (hence Bier's block), has been recommended as an alternative to general anaesthesia for operations on the limbs, principally the arms.¹⁻⁶ An intravenous cannula is inserted, the limb exsanguinated, a tourniquet applied, and the veins filled with local anaesthetic.

Some facts are known about the accidents. The patients were all healthy and being treated for minor conditions in accident and emergency departments. Two were boys, aged about 11. In each case a different automatic tourniquet was used; the drug used was bupivacaine; and the doctor setting up the block was a senior house officer in accident and emergency and was due to perform the operation without help from another doctor. In the three most recent cases the Scientific and Technical Branch was contacted to examine the equipment and found that it could have been used satisfactorily but that the cuff was deflated at some point when it should not have been. A hazard warning (HN(82)7) was issued, giving general advice that people should be familiar with the apparatus

and a second person should supervise the tourniquet during the operation. The hazard warning provoked an unprecedented number of inquiries but nevertheless a further, similar death took place about two weeks later.⁷

Three elements merit discussion: the equipment, the drugs, and the people who used them. Firstly, reliable isolation of the circulation of the limb is essential to prevent a bolus of local anaesthetic reaching the circulation. A blood pressure cuff may be adequate so long as it is secured and the supervisor of the technique is prepared continually to monitor the pressure and adjust it. The bicycle pump type of tourniquet is more convenient and certain in its operation. These two systems share the great merit of simplicity and each has a single gauge which shows the cuff pressure. The multiplicity of switches on automatic equipment introduces hazards from misunderstanding and malfunction. A common error is to assume that a gauge shows the cuff pressure when it actually shows the pressure available inside the machine. The machines are expensive and have if anything increased the incidence of tourniquet failure during orthopaedic surgery (J Spencer, personal communication); they are at present the subject of an evaluation programme by the Scientific and Technical Branch. Complex equipment has many times proved to be no substitute for common sense and undivided attention; its failure should provoke articles,⁸ not disaster.

Reports on the safety of the technique have concentrated on signs of toxicity after release of the tourniquet; various minimum times (for example, 20 minutes) have been recommended to allow fixation of the drug in the tissues and thus reduce peak arterial concentrations after release. The likelihood of direct intravenous injection during routine use has been underestimated; the effects of the bolus are likely to be worse in a frightened patient as circulating catecholamines will ensure that the maximum amount of the cardiac output reaches the brain and heart, which are the main target organs for toxicity.

Secondly, the systemic toxicity of local anaesthetic drugs is in direct proportion to their potency. Given equivalent concentrations, volume, and rate of entry to the circulation, prilocaine has the theoretical advantage of greater extraction in the lungs; its ability to cause methaemoglobinaemia is irrelevant to intravenous regional analgesia.⁹ It has yet to become popular in Britain, though the case for its use has been well argued.^{6 9-11} Bupivacaine is normally less toxic than lignocaine^{12 13} because of its greater fixation in tissues and more rapid metabolism. These factors are not relevant to the effects of a bolus and may have encouraged the use of unnecessarily high doses. Thus Rawlings and Staniforth⁴ reported good results from using only 10 ml of 0.25% bupivacaine, allowing a few extra minutes for analgesia to develop.

The recognition and treatment of toxic reactions are crucial; even if accidents could be eliminated, there remain the possibilities of individual low thresholds¹⁴ or abnormal venous drainage within bones. Excellent descriptions of the necessary treatment have been given by Scott¹⁵ and Moore *et al*¹⁶: speed, oxygen, and thiopentone are the most important features. A training film is urgently needed, with adequate simulation of a range of toxic reactions. In particular, neither sleepiness nor talkativeness are widely recognised as important symptoms of toxicity. Hypoxia occurs with terrifying rapidity in a patient having convulsions, and the fact that deaths occur show how inadequate are the standard resuscitation procedures in accident and emergency departments (though these are frequently successful in other circumstances).

Considerable time and skill are required to teach a succession

of senior house officers to the necessary standard; an average district general hospital would have to train one each month in addition to training its anaesthetic staff. This time must offset the possible saving in the requirement for anaesthetic services. Anaesthetic departments should offer as comprehensive a service as possible; only anaesthetists are likely to have the confidence and skill to maintain oxygenation and give thiopentone quickly enough to prevent tragedy. If my son requires intravenous regional analgesia I would prefer to wait until an anaesthetist was available.

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Monetarism and health

Last month the Government's "think tank" produced for the Cabinet a paper suggesting radical cuts in public spending including a proposal for replacing the NHS with a scheme based on private health insurance.¹ Now, with astute political timing, the Nuffield Provincial Hospitals Trust has just published a collection of essays² on private and public financing of health care in Britain, our European neighbours, and in North America.

The essayists recognise that at first sight the European systems would look attractive to politicians wanting to cut public spending and reduce the part played by central government in the planning and control of the health services. In reality, however, a close examination of other systems shows that they are desperately anxious to restrain the increasing proportion of their gross domestic products spent on health; and, whereas in Britain public expenditure on the NHS can be controlled and balanced against other programmes such as education (and defence, with all its contentious overtones),