More recently the antisecretory activity of other prostaglandin analogues has been reported (Robert and Magerlein, 1973; Karim *et al.*, 1973 c). Absence of uterine stimulant activity among these compounds would be an additional advantage. They could never, however, remove the need for scrupulous anaesthetic technique.

Oral administration of prostaglandin 15 (R) 15-methyl-E_2 methyl ester (100-200 μg, 2-hourly) would probably constitute a safe means of inducing labour, especially in high anaesthetic risk patients (Crawford, 1970).

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MEDICAL MEMORANDA

Norwegian Scabies During Immunosuppressive Therapy

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Norwegian scabies, first described by Danielssen and Boeck (1848), is caused by an overwhelming infestation by the human scabies mite. The factors summarized in the table are thought to be important in its development. The widespread gross hyperkeratosis, with little or no pruritus, which occurs may give a diagnostic problem solved only when epidemics of the more usual form of scabies occur in contacts. We describe here the first case attributable to therapy with immunosuppressive drugs.

Case Report

A 27-year-old unmarried janitor was admitted to hospital in December 1971 with renal failure (blood urea 530 mg/100 ml) and malignant hypertension due to long-standing hydronephrosis. Intermittent haemodialysis was followed in May 1972 by renal transplantation and immunosuppressive therapy in the form of azathioprine 150 mg and prednisolone 50 mg daily. Satisfactory renal function was achieved (blood urea 72 mg/100 ml) and the patient was allowed home, requiring no antihypertensive therapy.

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Aetiological Factors in Norwegian Scabies

Factors	Reference
Mental defect	
Imbecility (esp. Down's syndrome)	Calnan, 1950
Senile dementia	Zoon and Mali, 1949
Gross debility:	
Leukaemia	Dostrovsky *et al.*, 1956
Beri beri	Backhouse, 1929
Tuberculosis	Backhouse, 1929
Bacillary dysentery	Backhouse, 1929
Rheumatoid arthritis	Wells, 1952
Lack of cutaneous sensation:	
Leprosy	Danielssen and Boeck, 1848
Syringomyelia	Prakken and van Vloten, 1949
Tabes dorsalis	Zoon and Mali, 1949
Lack of hypersensitivity:	
Failure of sensitization	Anderson, 1952
Acquisition of tolerance	Burks and Jung, 1956
Corticosteroid and other immunosuppressant drugs	present case

When readmitted in November 1972 for repair of a massive inguinal hernia he had a widespread skin eruption which had developed during the previous few weeks. He was known to be of rather low intelligence but also appeared miserable and withdrawn. Though he scratched occasionally, itching was not a complaint.

Examination showed an exfoliative dermatitis, with yellowish discoloration and thickening of the nails. The palms and soles were grossly hyperkeratotic with large scales and some exudation. There was widespread scaling over the trunk and limbs but his face was less affected. No definite diagnosis was made at first. After a few days of cleansing and the application of a diluted steroid ointment, much of the crusting on his neck and the midline of his back and chest had cleared leaving multiple papules (fig. 1). Norwegian scabies was suspected at this time, and microscopical examination of scrapings from the chest and palms showed large numbers of mites. It was then noticed that there were burrows on his face extending up to his hair line (fig. 2), from which further acari were isolated.

One application of 1% gamma-benzene hexachloride produced a striking reduction of scaling and an improvement in his general well-being. After this treatment no further live acari were found but another application was given a week later.

Within two or three weeks cases of scabies arose in the patients and staff of the surgical ward where he was nursed. It was diagnosed, or

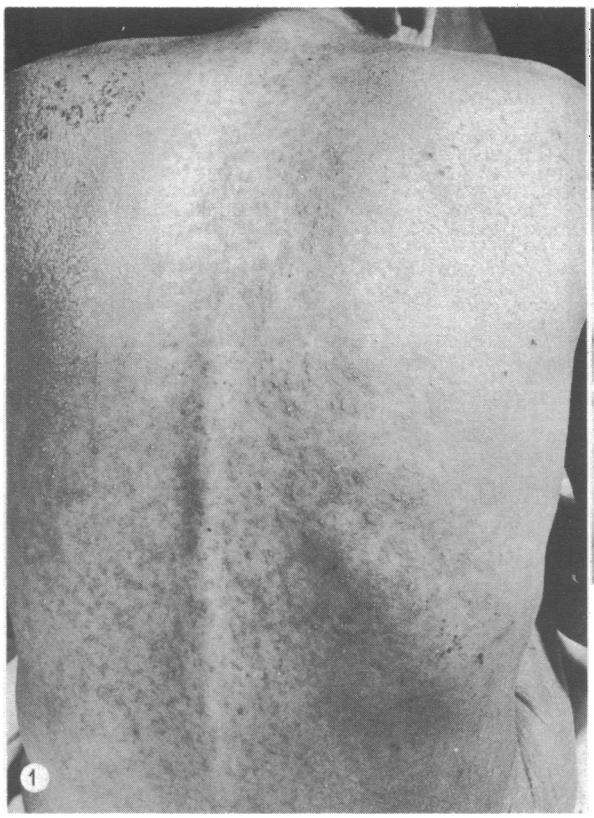

FIG. 1—Appearance of back at time of diagnosis.

FIG. 2—Side of face, showing multiple burrows.

strongly suspected, in six of the nursing and medical staff and 12 patients. Those patients seen after their discharge presented with typical scabies, but many of the affected staff appeared to have a modified form. This was probably due to early detection, because all those in the affected unit were aware of the possible risk. Some of the nurses developed itchy papules confined to the flexor surfaces of their forearms, and two elderly and immobile patients on the watd who required frequent lifting had similar lesions on their lateral chest walls and axillary folds.

Comment

In typical scabies the number of burrowing, adult, female mites is small—usually fewer than 20. In contrast, patients with Norwegian scabies have many hundreds of thousands. Hessler (1893) estimated that there were two million in his patient, and this accords well with the theoretical mite population of three million calculated by Johnson (Mellanby, 1944) assuming a seven-week period of uninterrupted multiplication. Pruritus is thought to be important in limiting mite populations, since it results in scratching, which removes mites mechanically, and in secondary infection with the formation of pus, which is acaricidal (Mellanby, 1944).

Though the immunology of scabies has not been fully established, the onset of itching, after four weeks in which symptoms are absent, is thought to be due to the development of hypersensitivity. Skin tests to mite extracts are negative in people who have not had scabies but give an immediate positive reaction in those who have (Mellanby, 1944). A positive Prausnitz-Küstner reaction has been found (van Prakken and van Vloten, 1949) and in second infestations itching starts at once (Mellanby, 1944).

Azathioprine is converted in the body to mercaptopurine, through which it exerts its immunosuppressive effect by interfering with purine synthesis, and hence DNA production. When given at the same time as an antigen it inhibits the development of a primary immune response. It seems likely that in a patient such as ours, where immunosuppressants are being given, freshly acquired scabies would not produce hypersensitivity or consequent itching, and the mites could multiply, uninterrupted, in a favourable environment.

Norwegian scabies may be a rare complication of immunosuppressant therapy, but in view of its contagious nature physicians should be aware of the possibility in a patient who develops a widespread hyperkeratotic eruption.

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