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CASE REPORTS

Anticholinergic drugs, buccal ulceration and mucosal potential difference

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Summary

Measurement of changes in buccal mucosal potential difference produced by contact with drug formulations may provide a means of predicting their mucosal toxicity and ulcerogenic activity.

Introduction

Buccal and oesophageal ulceration has been reported after administration of several drugs including emepronium bromide, potassium chloride, tetracycline and clindamycin (Strouthidis, Mankikar and Irvine, 1972; Sutton and Gosnold, 1977). Buccal ulceration is usually precipitated by retention of tablets in the mouth during disintegration, and oesophageal ulceration by swallowing whole tablets or capsules without water (Strouthidis *et al.*, 1972; Kenwright and Norris, 1977). As a result of observing buccal ulceration following both emepronium bromide and propantheline bromide in an elderly patient, their effects on buccal mucosal potential difference were compared.

Case history

A 95-year-old female patient, incontinent only at night, was treated with emepronium bromide 100 mg at 21.00 hr for 7 days and then 250 mg daily. She developed severe buccal mucosal ulceration after 14 days' treatment, and it became apparent that she was retaining the tablets in the mouth despite their bitter taste and being encouraged to swallow them. The ulcers healed within 6 days of stopping treatment but returned on commencing treatment with propantheline bromide 15 mg at night.

Buccal mucosal potential difference

The buccal mucosa is negatively charged with respect to a skin electrode, thus demonstrating a polarity similar to other gastrointestinal mucosal surfaces (Edmonds and Godfrey, 1969). This potential difference is reduced over areas of mucosal damage, for example aphthous ulceration in the mouth (Huston, 1977) or in ulcerative colitis (Edmonds and Pilcher, 1973). In five normal subjects aged 21–30 years and in random order, the local mucosal effects of emepronium bromide 200 mg and propantheline bromide 15 mg were compared. Complete disintegration of one tablet in contact with the mucosa of the lower lip every 8 hr for 24 hr produced a positive shift in mucosal potential difference, characteristic of functional mucosal damage (Huston, 1977). This shift was 11 ± 3 mV (mean $\pm$ s.d.) after emepronium bromide and 9 ± 2 mV after propantheline bromide.

It is probable that the decrease in salivary secretion produced by these anticholinergic drugs, and this local mucosal effect together account for the observed ulcerogenic activity of the highly ionized quaternary ammonium compounds. Although emepronium bromide is not unique in causing such ulceration the swelling agent incorporated in the commercial preparation (Ceteprin) appears to render these tablets particularly likely to adhere to mucosal surfaces in situations where there is insufficient water for full disintegration (Pilbrant, 1977).

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