

Short Communications

Dermal sensitization potential of 2-bromo-2-nitropropane-1,3-diol (Bronopol®)

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Marzulli & Maibach (1973, 1974) concluded that under the conditions of a closed patch test, 2-bromo-2-nitropropane-1,3-diol (Bronopol) in yellow soft paraffin is a potential skin sensitizer. This work showed a dose-response relationship; the response decreased to zero at an induction concentration of 2 %, a level considerably in excess of that normally used. In such studies it is important but sometimes difficult to distinguish between an irritancy and a sensitization response. In view of the high challenge concentration used (2.5 %), further investigations were warranted.

This study examines in more detail the human skin sensitization potential of Bronopol under these conditions. To define the lower limit of skin irritancy, a preliminary study was conducted in which Bronopol in Yellow Soft Paraffin BP, at levels of 0.1, 0.5, 1.0, 2.5 and 5 % was applied daily for 21 days under an occlusive patch to the same site on the backs of eight normal subjects (21-day Cumulative Irritancy Assay, Phillips et al. 1972). The reactions were assessed daily on a five-point scale. From these data it was concluded that, under these conditions, the irritancy threshold was approximately 0.5-1 %. It was decided to adopt a concentration of 0.25 % for the sensitization challenge test.

Ten applications of 5 % Bronopol in Yellow Soft Paraffin BP (0.5 g) were made at the same site on normal subjects over a period of 3 weeks (48-hourly during the week and 72-hourly during the weekend; Marzulli & Maibach 1974). The test area (the upper lateral back) was covered with an occlusive patch (Johnson and Johnson Square Band-Aid®). Following a rest (incubation) period of 2 weeks, a challenge patch was applied at a different site, containing 0.25 % Bronopol in Yellow

Soft Paraffin BP (0.5 g) and allowed to remain in place for 72 h. Considerable care was used to ensure that Bronopol was evenly triturated in the vehicle. Subsequently, skin reactions were assigned on a five-point scale; 0-4 (Marzulli and Maibach, 1974).

A total of 120 subjects began the study. There were no withdrawals for toxicity-related reasons. Many subjects showed irritation reactions from the 5 % concentration used in the induction phase. There was no score other than zero obtained from the 93 subjects on whom the challenge tests were conducted.

This work suggests that false positives may have occurred in the earlier study, caused by the use of concentrations of Bronopol above the irritancy threshold or uneven trituration of the agent in the vehicle. It can be concluded that, under the conditions of this test, no evidence of sensitization was observed.

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References

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