ABSTRACT

New insights into the mechanism of action of gelatine tannate for acute diarrhoea. Part 1: film-forming effect.

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Background:

Gelatine tannate has recently been approved in Europe for the control and reduction of the symptoms associated with acute diarrhoea by restoring the physiological function of the intestinal wall. The mechanism of action for gelatine tannate is not entirely clear but it is thought to act locally on the intestinal wall via the formation of a protein-based film, thereby protecting the guts from the irritable effect of intestinal secretions responsible for intestinal toxaemia. Tannins are well known for their astringent properties, permitting the precipitation of pro-inflammatory mucoproteins from the intestinal mucus responsible for local inflammation and elimination through the faeces.

Aims:

We used a modified Corrositex® method to demonstrate the in vitro film-forming efficacy of gelatine tannate.

Study design and methods:

Corrositex® is an *in vitro* method used to determine the corrosive potential of chemicals and chemical mixtures. The basic version of the modified Corrositex® method allows to evaluate the corrosive potential of a test substance upon a membrane of biologic and synthetic origin (bio-barrier membrane), which is designed to mimic the effect of corrosives on living tissues. The result obtained, expressed in contact time, can be used to predict the results of an in vivo cutaneous corrosion test.

For this particular assay, the original method was modified to: a) select the test corrosive solutions among sulphuric acid 96%, hydrochloric acid 37%, hydrochloric acid 10%, and hydrochloric acid 3.7% by comparing their corresponding corrosion times (known as the preliminary tests); the corrosion time obtained for the finally selected corrosive substance was used a control ; b) test the corrosive solution by pouring it directly onto the permeable membrane, pre-treated at 37°C for 1 minute with a saline solution of gelatine tannate (by pre-diluting 50 mg of gelatine tannate in saline solution 150 µl at 37°C). The new corrosion times were measured against the results obtained for the control (first step).

Results:

In view of the results obtained for the preliminary test corrosive solutions, the assay was carried out by directly pouring hydrochloric acid 37% onto the pre-treated bio-barrier membrane with gelatine tannate. We observed a significant increase on the mean corrosion times of the bio-membrane by hydrochloric acid 37% from 400 to 699 seconds, following pre-treatment with gelatine tannate.

Conclusions

Our results corroborate the hypothesis that gelatine tannate confers protection to the bio-barrier membrane by significantly increasing the time required for its corrosion ($p<0.01$). No deviation was observed during the assay.