A SELF-DISPENSING LOCAL ANAESTHETIC SOLUTION*

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ABSTRACT

The stabilisation of procaine hydrochloride in the presence of adrenaline and capryl hydrocupreinotoxin in Ringer's solution has been discussed in the present note.

INTRODUCTION

Synotox[1] has been described as a Ringer solution containing two per cent procaine hydrochloride with or without the addition of adrenaline in amounts of 1 in 200,000 to 1 in 25,000. Synotox solution may be dispensed either in ampoules, vials, or self-dispensable cartridge. The latter form makes it more attractive to men in active field duty. Capryl hydrocupreinotoxin hydrochloride in amounts not exceeding that of adrenaline is also used to enhance the healing property of this preparation. The stepwise synthesis of capryl hydrocupreinotoxin has been described by earlier authors.[2, 3, 4]

Since the presence of adrenaline makes it susceptible, on storage, to oxidation and consequent color-formation it was the objective of this work to find out suitable stabilisers for the synotox solution.

The stabilisers examined were: Thioglycollic acid (0·3), Ethylene Diamine Tetra Chloro Acetic Acid EDTA (0·005), thiourea (0·3), cupferron (0·003), sodium metabisulfite (2·0), cysteine hydrochloride (0·01), ascorbic acid (0·25), hexamine (2·5), and potassium thiocyanate (0·5%). The figures in the parentheses represent the weight in grammes of the substances added to hundred milli-litres of synotox solution. The results are given in the table at the end.

Thioglycollic acid, thiourea, and sodium metabisulfite only could stabilise the preparation for a period of at least one year (beyond which the solutions were not checked). Cupferron formed a yellow solution and therefore could not be used at all. It was also found that phosphate was less color producing than the hydrochloride of capryl hydrocupreinotoxin.

The following preparation of synotox was less toxic and more color-stable over a long period of time.

Sodium chloride (4·6 gm), potassium chloride (0·21 gm.) calcium chloride (0·06 gm), and 85 per cent phosphoric acid (0·5 ml.) were dissolved in 500 ml. double-distilled water. The solution was allowed to stand approximately 48 hours at room temperature and filtered.

In 100 ml. of the filtrate, thymol (40 mgm) and capryl hydrocupreinotoxin (2·3 mgm) were dissolved by warming over a free flame. Adrenaline (2 mgm) and thiourea (0·3 gm) were then added, dissolved into solution by shaking but without further warming, cooled to room temperature, filtered through Whatman No. 1 filter paper. The synotox solution thus made (pH 3·0—3·5) was filled in autoclaved containers. The presence of thymol and hydrocupreinotoxin makes the preparation self-sterilising.

* The compilation was done during the tenure as Pool Officer of the C. S. I. R., Government of India.

TABLE

EFFECT OF STABILISERS

Stabiliser	Time in Months (No colour formation)
1. Thioglycollic acid (0·3%) + Phosphoric acid (0·1%)	Beyond 9
2. Ephedrine could be used in place of adrenaline without loss in duration of anaesthesis.	
3. EDTA (0·005%)	3·5
4. Thiourea (0·1%)	Beyond 4
5. Sodium metabisulfite (2%) + Cysteine, HCl (0·01%)	Beyond 10
6. Cysteine. HCl (0·01%)	0·5
7. Na-metabisulfite (2%)	Beyond 9
8. Thioglycollic acid (0·3%) + Na-metabisulfite (0·15%)	Beyond 9

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