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STUDIES ON ROOT CANAL MEDICAMENTS

II. CYTOTOXIC EFFECT OF MEDICAMENTS USED IN ROOT FILLING

by

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INTRODUCTION

In an earlier study (*Engström & Spångberg,* 1966) an examination was made of the cytotoxic effect of various antiseptics used in endodontics on HeLa cells. The object of the present study was to examine the cytotoxic effect of medicaments used for dehydration and treatment of the root canal immediately prior to root filling with gutta percha.

MATERIAL AND METHOD

The medicaments examined were absolute alcohol, chloroform and resin-chloroform (colophony 8 g, chloroform 92 g).

The cytotoxic effect of the medicaments was examined on HeLa cells by culturing on microscope slides in a culture chamber by *Bergman*'s method (1959, 1963) with certain modifications (*Engström & Spångberg,* 1967).

RESULTS

The total number of mitoses on 20 fields of vision and the mean value of cells on 20 fields of vision per slide were determined (Table I, Fig. 1).

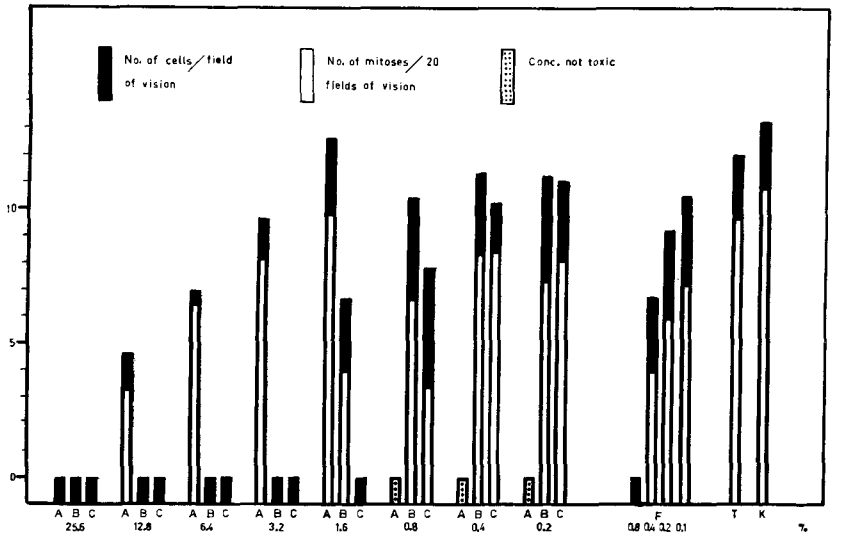

Fig. 1. Effect on HeLa cells of three root filling medicaments.

A, absolute alcohol B, resin chloroform C, chloroform
Controls F, phenol T, Tween 80® K, calf serum

Table I

Effect on HeLa cells of absolute alcohol, resin chloroform and chloroform
T, toxic concentration

Medicaments	Absolute alcohol		Resin-chloroform		Chloroform	
	No. of cells/ field of vision	No. of mitoses/20 fields of vision	No. of cells/ field of vision	No. of mitoses/20 fields of vision	No. of cells/ field of vision	No. of mitoses/20 fields of vision
Concentration	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$
25.6 %	T	T				
12.8 %	4.6	3.2				
6.4 %	7.0	6.4				
3.2 %	9.7	8.1	T	T		
1.6 %	12.7	9.8	6.7	3.9	T	T
0.8 %	—	—	10.5	6.6	7.9	3.3
0.4 %			11.4	8.3	10.3	8.4
0.2 %			11.3	7.3	11.1	8.1
0.1 %			—	—	—	—

The control glasses with calf serum and 0.1 per cent Tween 80® showed a dense growth of cells.

It is evident from the tables and the graph that phenol of 0.8 per cent strength exerted a cytotoxic effect on the HeLa cells. The same applies to absolute alcohol of 25.6 per cent strength, to 1.6 per cent chloroform and 3.2 per cent resin-chloroform.

To summarize the three medicaments examined had a weaker cytotoxic effect than phenol, which was used as a reference. Absolute alcohol had a considerably weaker effect than chloroform and resin-chloroform.

The results of this study indicate the need for caution in the use of chloroform and resin-chloroform.

SUMMARY

A study of the cytotoxic effect of root filling medicaments (absolute alcohol, chloroform and resin-chloroform) on HeLa cells showed that all had a weaker effect than phenol. Absolute alcohol had a much weaker effect than chloroform and resin-chloroform.

RÉSUMÉ

ETUDES SUR LES MÉDICAMENTS POUR TRAITEMENTS DES CANAUX RADICULAIRES

II. ACTION CYTOTOXIQUE DE CERTAINS MEDICAMENTS UTILISÉS AU COURS DE L'OBTURATION DES CANAUX RADICULAIRES

Une étude concernant l'action cytotoxique sur des cellules HeLa de certains médicaments utilisés au cours de l'obturation des canaux radiculaires (alcool absolu, chloroforme et résine-chloroforme) a montré qu'ils avaient tous de ce point de vue une action plus faible que le phénol. L'action de l'alcool absolu était beaucoup plus faible que celles du chloroforme et du produit résine-chloroforme.

ZUSAMMENFASSUNG

STUDIEN ÜBER WURZELKANALMEDIKAMENTEN II. EINE CYTOTOXISCHE UNTERSUCHUNG VON WURZELFÜLLUNGSTECHNISCHEN MEDIKAMENTEN

Eine Untersuchung des Cytotoxischen Effektes von Wurzelfüllungstechnischen Medikamenten (Aethanol, Chloroform und

Harzchloroform) auf Helazellen zeigten dass samtlichen einen niedrigeren Effekt als Fenol hatten. Aethanol hat einem wesentlig niedrigeren Effekt als Chloroform und Harzchloroform.

REFERENCES

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