p-7 Cytotoxicity and antibacterial property of a new resin-based sealer

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Ⅰ. Objectives

A large variety of root canal filling materials have been advocated through the years. Recently, domestic research teams have succeeded in developing a improved new resin-based sealer. This study aims to evaluate the cytotoxicity and antibacterial effect of a improved new resin-based sealer in comparison with those of other commonly used resin-based, ZOE-based, and calcium hydroxide-based sealers.

Ⅱ. Materials and Methods

Five root canal sealers and a new resin-based sealer (Adseal) were tested (Sealapex ; Kerr ; USA , Tubli-Seal EWT ; Kerr ; USA , Pulpcanal sealer EWT ; Kerr ; Germany , AH 26 ; De trey/ Dentsply; Germany , AH Plus ; De trey/ Dentsply; Germany). After setting for 6hrs, 24hrs, 48hrs, 1wk , 5wks, the sealers were covered with 4x104 L929 cells, and cytotoxicity was assessed by a quantitative technique at three observation periods (24hrs, 48hrs, 72hrs). Antibacterial activity was evaluated by agar diffusion test using *Enterococcus faecalis, Porphyromonas endodontalis, Porphyromonas gingivalis, Prevotella intermedia, Fusobacterium nucleatum, and Fusobacterium necrophorum* with freshly mixed sealers.

Ⅲ. Result

The experimental results were statistically analyzed by Kruskal-Wallis test ($P<0.001$), Friedmans 2-way ANOVA ($P<0.05$).

1. Cytotoxicity test

   The 6hrs setting material of Adseal had 66% viable cells at 24 hrs incubation period, wheras other sealers had low viable rates. That means Adseal was significantly early less cytotoxic compared with other sealers.

2. Antibacterial properties test

   Most materials formerly or currently used are antibacterial to some extent. The results of this study have shown the various sealers differ in their antibacterial properties. Adseal showed a high level of effects against microorganisms except *E. faecalis* while AH26, another resin-based sealer, had a high level of effects against all those microorganisms.

Ⅳ. Conclusion

These findings suggest that Adseal has great advantages over other sealers in terms of showing a mild cytotoxicity and a more potent antibacterial effect on black pigmented anaerobic rods. Sealers that have very strong antibacterial effects are also toxic to hosts. We do not necessarily need those sealers with strong antibacterial effects, but we need sealers that never promote the growth of bacteria. In this regard, Adseal can be evaluated as the sealer that has a certain desirable degree of antibacterial effects and at the same time, does little harm to hosts.