

**Evaluation of Antibacterial Action of
Photosensitizer Solution Activated by Diode
Lamp and Three Intracanal Medicaments
(In Vitro Study)**

A Thesis

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Abstract

The elimination of the microorganisms from the root canal systems, an important step for the successful root canal treatment. Endodontic chemo-mechanical disinfection cannot complete elimination of the bacteria from the root canal system because the complexity of the root canal and resistant of some microorganism to the intracanal medicaments. Photoactivated disinfection (PAD) is a new technique introduced in endodontics that combines the action of a photosensitizer and a low intensity light source.

This in vitro study was conducted to evaluate in vitro the antibacterial effectiveness of the photoactivated disinfection by using the toluidine blue O and a low- energy light emitting diode (LED) lamp .

Sixty single rooted extracted teeth were decoronated, instrumented, irrigated, sealed at the apex and contaminated with endodontic anaerobic bacteria for 7 days to form biofilms in prepared root canals. The roots were divided to five experimental groups according to the medication procedure ;

Group I. Twelve teeth were medicated by photosensitizer (toluidine blue O) solution activated by diode lamp (FotoSan; CMS Dental, Copenhagen, Denmark).

Group II. Twelve teeth were medicated by the tricresol formalin; by the cotton pellet technique.

Group III. Twelve teeth were medicated by the camphorated monochlorophenol (CMCP); by the cotton pellet technique.

Group IV. Twelve teeth were medicated by calcium hydroxide (Ca(OH)₂) paste; by condensing it in root canal.

Group V. Without the intracanal medication (control group).

Abstract

The bacterial swabs were taken before and after medication and following the photoactivated disinfection procedure immediately and after 7days. the canal contents were swabbed by paper points inserted to the root canals, serially diluted and cultured on blood agar. Survival fractions were calculated by counting colony-forming units.

Treatment of the root canals with PAD (fotosan) caused a high significant reduction of the bacterial count, resulting in a 96.39% elimination of root canal bacteria, followed by root canal treated by tricresol formalin (group II), then CMCP (group III) and Ca(OH)₂ (group IV) respectively.

Light activated disinfection possesses potent antibacterial action against the anaerobic bacteria cultivated in root canals.