The permeability of dental procedure and examination gloves by an alcohol based disinfectant

Dental Materials
2000 Mar; 16(2):139-144

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OBJECTIVES: The usage of gloves in dentistry has increased greatly over the last 10 years and this has highlighted certain problems when gloves are being worn extensively. While skin irritations and allergies caused by latex proteins and accelerators have been the main focus of attention, dental materials such as disinfectants have also become known as a source of skin reactions. This study was performed to evaluate the permeability of various gloves by ethanol.

METHODS: The tip of the middle finger of 13 glove brands (natural latex gloves (NLG) powdered or unpowdered, powdered vinyl, nitrile and synthetic elastomer) was exposed to 5 ml of a hand disinfectant (Desderman). After a penetration time ranging from 2 min to 8 h the permeation of Desderman was detected with a gas chromatograph.

RESULTS: Only one component of the disinfectant (ethanol) could be detected to have gone through the gloves. After only 2 min the vinyl and one nitrile glove and after 10 min all glove types were permeated. Powder seemed to have no real influence on the penetration of ethanol. Some natural latex gloves showed a low rate of leakage, while vinyl and nitrile gloves were penetrated quickly and to a great extent. The synthetic elastomer (Biogel Neotech) was the only one with a significantly lower penetration even after 2-8 h.

SIGNIFICANCE: While there are reports of adverse skin reactions to alcohol the amount of ethanol (up to 40 microliters after 2 h) detected in this study is much too low to cause irritations and certainly not toxicity, but it could possibly initiate allergic reactions.