Efek tegdma terhadap protein total dan profil protein sel-sel pulpa gigi (in vitro)

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Abstrak

Latar belakang: Trietylene glycol dimethacrylate (TEGDMA) merupakan salah satu monomer yang terkandung dalam bahan tambal resin komposit. Jika resin komposit mengalami polimerisasi tidak sempurna, TEGDMA dengan mudah terlepas ke dalam rongga mulut dalam beberapa menit hingga jam setelah penambalan, kemudian berpenetrasi mencapai pulpa. TEGDMA yang terlepas dilaporkan bersifat sitotoksik.
Tujuan: Menentukan efek TEGDMA (4 mM, 8 mM, dan 12 mM) terhadap protein total dan profil protein medium kultur sel-sel pulpa gigi.
Metode: Sel-sel pulpa didapat dari jaringan pulpa gigi sehat yang baru diekstraksi, kemudian dikultur pada medium kultur DMEM. Setelah sel kultur tampak confluent (±2 malam), dilakukan subkultur yang kemudian digunakan sebagai sampel pada penelitian ini. Selanjutnya, kultur sel-sel pulpa gigi pada kelompok perlakuan masing-masing dipapar TEGDMA 4 mM, 8 mM, dan 12 mM. dan diinkubasi pada suhu 37°C, 5% CO2 selama 24 jam. Sedangkan pada kelompok kontrol tidak dipaparkan TEGDMA. Konsentrasi protein total medium kultur diukur menggunakan Bradford protein assay lalu dibaca dengan microplate reader pada panjang gelombang 655 nm. Kemudian, identifikasi profil protein medium kultur dilakukan dengan metode SDS PAGE.
Hasil: Nilai rerata konsentrasi protein total medium kultur (µg/ml ± SD) kelompok perlakuan TEGDMA 4 mM, 8 mM, dan 12 mM berturut turut adalah 28635.85 ± 2373.39, 35288.41 ± 3469.47, dan 38199.79 ± 2752.47. Nilai-nilai tersebut lebih tinggi daripada kelompok kontrol 27073.83 µg/ml ± 2772.46. Analisis statistik one way ANOVA menunjukan terdapat perbedaan bermakna antara kelompok perlakuan TEGDMA 8 mM dan 12 mM dengan kelompok kontrol ($p<0,05$). Hasil identifikasi profil protein medium kultur menunjukan tampak perubahan profil protein pada setiap kelompok setelah pemaparan TEGDMA 4 mM, 8 mM, dan 12 mM.
Kesimpulan: Pada penelitian ini konsentrasi protein total medium kultur meningkat dan profil protein medium kultur mengalami perubahan setelah pemaparan TEGDMA 4 mM, 8 mM, dan 12 mM pada sel-sel pulpa.
<hr><i>Background: Trietylene glycol dimethacrylate (TEGDMA) is one of monomer that contained in composite resin restoration. TEGDMA could be released from composite resins to the oral cavity following incomplete polymerization in a few minutes to hours after the placement of restoration, and then the monomers of TEGDMA could penetrate the dental pulp. TEGDMA that released was reported has cytotoxic effects.
Objectives: To determine the effect of TEGDMA (4 mM, 8 mM, dan 12 mM) on total protein and protein profile of culture medium of the dental pulp cells.
Methods: The pulp cells were isolated from the pulp of the freshly extracted teeth, and cultured in culture medium of DMEM. After the cells visually confluent (±2 nights), subcultured to be used as samples.

Afterwards, the cells culture in treatment group were treated with TEGDMA 4 mM, 8 mM, dan 12 mM and incubated at 37°C, 5% CO2 for 24 hours. Whereas, in control group without TEGDMA exposure. The concentration of total protein in culture medium was measured by Bradford protein assay then were read by microplate reader in 655 nm. Then, the protein profile of culture medium was identified by SDS PAGE method.

Result: The mean of total protein of culture medium (µg/ml ± SD) on treatment groups of TEGDMA 4 mM, 8 mM, dan 12 mM were 28635.85 ± 2373.39, 35288.41 ± 3469.47, and 38199.79 ± 2752.47 were higher than the controls 27073.83 ± 2772.46. One way ANOVA statistic analysis showed that treatment group of TEGDMA 8 mM and 12 mM were significant different compared with the control group ($p<0,05$). The protein profile of culture medium was altered after TEGDMA exposure.

Conclusion: In this research the total protein of culture medium was increased and its protein profile was altered after exposure of TEGDMA 4 mM, 8 mM, and 12 mM to dental pulp cells.</i>