

Efek xylitol terhadap protein total dan profil protein medium kultur sel-sel pulpa gigi (in vitro)

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Abstrak

Latar belakang: xylitol merupakan gula alkohol (polyols) dengan 5 ikatan rantai karbon yang dilaporkan bermanfaat bagi kesehatan manusia. Dalam bidang kedokteran gigi, xylitol memiliki peran sebagai bahan antikaries gigi karena dapat menghambat pertumbuhan bakteri *Streptococcus mutans*. Namun, efek xylitol terhadap sel-sel pulpa gigi belum diketahui. Pulpa gigi merupakan jaringan yang sensitif terhadap paparan benda asing. Pada pulpa gigi yang terbuka, xylitol dapat menimbulkan efek biologik sel.

Tujuan: untuk mendeteksi efek paparan xylitol terhadap protein total dan profil protein medium kultur sel-sel pulpa gigi.

Metode: sel-sel pulpa gigi didapat dari jaringan pulpa gigi sehat yang baru diekstraksi, kemudian dikultur dalam medium DMEM (37°C, 5% CO₂) hingga confluent. Kemudian dilakukan subkultur dengan kondisi yang sama selama semalam. Kelompok perlakuan dipaparkan xylitol dengan konsentrasi 2%, 4%, 8%, dan 16%, tetapi kelompok kontrol tidak dipapar xylitol. Konsentrasi protein total medium kultur sel-sel pulpa gigi diukur dengan menggunakan Bradford protein assay pada panjang gelombang 655 nm. Sedangkan profil protein medium kultur sel-sel pulpa gigi dianalisis dengan teknik SDS PAGE.

Hasil: rerata konsentrasi protein total ($\mu\text{g/ml} \pm \text{SD}$) medium kultur sel-sel pulpa gigi pada kelompok perlakuan xylitol 2% ($24.253,71 \pm 2.363,29$), xylitol 4% ($21.925,42 \pm 1.001,38$), xylitol 8% ($25.456,51 \pm 4.569,45$), dan xylitol 16% ($26.306,66 \pm 5.550,82$) secara statistik dengan Oneway ANOVA lebih rendah bermakna ($p < 0,05$) dibandingkan dengan kontrol ($33.395,64 \pm 4.209,08$). Dari hasil SDS PAGE, ternyata tidak terjadi perubahan profil protein medium kultur sel-sel pulpa gigi setelah pemaparan xylitol.

Simpulan: konsentrasi protein total medium kultur sel-sel pulpa gigi menurun setelah pemaparan dengan xylitol, namun profil protein medium kultur sel-sel pulpa gigi tidak mengalami perubahan.

Background: xylitol is one of sugar alcohol (polyols) with 5 carbon atoms which is reported to have benefits to our health. In dentistry, xylitol has anti-caries effect as the growth of *Streptococcus mutans* could be inhibited. However, the xylitol effects on dental pulp have not been known yet. Dental pulp tissue is sensitive to foreign substances. Xylitol could penetrate the exposed dental pulp and induce the biological response of the cells.

Objective: to detect the effects of xylitol on dental pulp cells determined by total protein and protein profile of culture medium of the dental pulp cells (in vitro).

Methods: dental pulp cells were obtained from healthy and freshly extracted teeth. Then, they were cultured in DMEM medium (37°C, 5% CO₂) until confluent approximately 2 days. Subsequently they were subcultured and used as samples. The treatment groups were treated with xylitol 2%, 4%, 8%, and 16% and incubated at 37°C, 5% CO₂ for overnight, while the control groups without xylitol. The total protein of culture medium was determined by Bradford protein assay in 655 nm. Whereas, the protein profile of culture medium were analyzed by SDS PAGE method.

Results: the mean of total protein? concentration ($\mu\text{g/ml} \pm \text{SD}$) of culture medium in treatment groups with xylitol 2% ($24.253,71 \pm 2.363,29$), xylitol 4% ($21.925,42 \pm 1.001,38$), xylitol 8% ($25.456,51 \pm 4.569,45$), dan xylitol 16% ($26.306,66 \pm 5.550,82$) were lower than control group ($33.395,64 \pm 4.209,08$). The comparison between the controls and treatment groups were analysed by Oneway ANOVA. All the treatment groups were significantly different compared with the controls ($p < 0,05$). By SDS PAGE, the protein profile of culture medium in all treatment groups was not altered.

Conclusion: the total protein? concentration of culture medium of the dental pulp cells were decreased after treated with xylitol. However, the protein profile of culture medium of dental pulp cells was not altered.</i>