

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

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Abstrak

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

Tujuan: untuk mendeteksi efek paparan xylitol dalam beberapa konsentrasi terhadap protein total dan profil protein sel-sel pulpa gigi secara in vitro.

Metode: sampel penelitian berasal dari sel-sel pulpa gigi sehat (tanpa karies) yang baru diekstraksi.

Selanjutnya dikultur selama semalam dan dilanjutkan dengan subkultur selama semalam. Kemudian kelompok perlakuan xylitol dipaparkan xylitol dengan konsentrasi 2%, 4%, 8%, dan 16%, sedangkan kelompok kontrol tidak diberi paparan xylitol. Protein total sel-sel pulpa gigi diukur dengan menggunakan metode Bradford assay dan profil protein sel-sel pulpa gigi dianalisis dengan menggunakan metode SDS PAGE.

Hasil: rerata konsentrasi protein total ($\mu\text{g/ml} \pm \text{SD}$) sel-sel pulpa gigi kelompok perlakuan xylitol 2% ($23031,305 \pm 1636,87$), kelompok perlakuan xylitol 4% ($26380,865 \pm 3278,0$), kelompok perlakuan xylitol 8% ($23192,574 \pm 1441,39$), dan kelompok perlakuan xylitol 16% ($21498,481 \pm 2633,37$) memiliki rerata konsentrasi protein total sel-sel pulpa gigi yang lebih tinggi dibandingkan kelompok kontrol ($19013,045 \pm 2188,51$) dan memiliki perbedaan bermakna berdasarkan uji statistik Oneway ANOVA. Namun, antar kelompok perlakuan xylitol 2%, 4%, 8% dan 16% tidak terdapat perbedaan bermakna ($p < 0,05$). Pada gambaran profil protein, tampak terjadi perubahan profil protein pada kelompok perlakuan xylitol 2% dan 8%.

Simpulan: pada penelitian ini terjadi peningkatan konsentrasi protein total dan perubahan profil protein sel-sel pulpa gigi setelah pemaparan xylitol.

Background: xylitol is sugar alcohol with 5 carbon atom in the molecule which has many benefits for human health. In dentistry, xylitol is an anti-cariogenic agent as it can inhibit *Streptococcus mutans* growth. Nevertheless, the effect of xylitol exposure to dental pulp cells has not been known yet. Dental pulp is a sensitive tissue toward exposure of several agents. In the exposed dental pulp, xylitol can cause biological effects.

Objectives: the effect of xylitol with several concentrations determined to total protein and protein profile of the dental pulp cells culture.

Methods: the dental pulp cells were obtained from healthy and freshly extracted teeth (non-caries).

Furthermore, dental pulp cells were cultured overnight and then subcultured another overnight. Afterwards, xylitol treatment group was exposed by 2%, 4%, 8%, and 16% xylitol, while control group was not exposed by xylitol. Total protein cells was measured by Bradford assay method and protein profile was

analyzed by SDS PAGE.

Results: the mean of total protein ($\mu\text{g/ml} \pm \text{SD}$) cells concentration? of 2% xylitol group ($23031,305 \pm 1636,87$), 4% xylitol group ($26380,865 \pm 3278,0$), 8% xylitol group ($23192,574 \pm 1441,39$), and 16% xylitol group ($21498,481 \pm 2633,37$) were statistically higher than the control group ($19013,045 \pm 2188,51$).

However, there were not significant differences between 2%, 8%, and 16% xylitol groups. From the result of SDS PAGE, it was shown that there was altered protein profile in 2% and 8% xylitol group.

Conclusions: in this research, the concentration of total protein cells were increased and the cells protein profile was altered in the dental pulp cells after xylitol exposed.</i>