

## ABSTRAK

Nama : Risco Taufik Achmad  
Program Studi : Pendidikan Dokter Gigi  
Judul : Efek Xylitol terhadap Protein Total dan Profil Protein Sel-sel Pulpa Gigi (*in vitro*)

**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.

**Kata kunci:**

xylitol, sel pulpa gigi, protein total, profil protein

## ABSTRACT

Name : Risco Taufik Achmad  
Study Program : Dentistry  
Title : The Effects of Xylitol on Total Protein and Protein Profile of  
The Dental Pulp Cells (*in vitro*)

**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-carries). 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.

**Keywords:**

xylitol, dental pulp cells, total protein, protein profile