EKSPRESI SIKLOOKSIGENASE-2 DAN JUMLAH SEL INFLAMASI SETELAH PEMBERIAN EUGENOL PADA PULPITIS IREVERSIBEL

(Kajian *in vivo* pada gigi molar tikus *Sprague dawley*)

INTISARI

Pulpitis merupakan peradangan pulpa sebagai reaksi jaringan pulpa terhadap cedera. Eugenol digunakan sebagai perawatan sementara pada kasus pulpitis. Penelitian ini bertujuan untuk mengetahui pengaruh eugenol terhadap ekspresi siklooksigenase-2 dan jumlah sel inflamasi pada pulpa gigi terinflamasi.

Tiga puluh ekor tikus *Sprague dawley* jantan berumur 3-4 bulan dengan berat badan 300-350 g dibagi secara acak dalam 2 kelompok yaitu perlakuan dan kontrol. Preparasi kavitas dilakukan pada permukaan oklusal gigi molar satu rahang atas menggunakan bur bulat No.010 hingga kedalaman pulpa. Pada dasar kavitas kelompok perlakuan (15 ekor) diberi eugenol dan kelompok kontrol (15 ekor) diberi akuades, kemudian kavitas ditumpat sementara. Tiga ekor tikus dari masing-masing kelompok dikorbankan pada 1, 3, 5, 7 dan 14 hari pasca preparasi kavitas. Rahang atas didekalsifikasi menggunakan EDTA 10%, ditanam dalam parafin dan dipotong serial. Jaringan dicat dengan *hematoxylin-eosin* untuk menghitung sel inflamasi dan imunohistokimia menggunakan antibodi anti-COX-2 untuk menilai ekspresi COX-2. Jumlah sel inflamasi dihitung di bawah mikroskop dengan perbesaran 400 kali. Siklooksigenase-2 dinilai berdasarkan intensitas warnanya.

Hasil penelitian menunjukkan bahwa infiltrasi sel inflamasi pada kelompok perlakuan lebih rendah dan ekspresi COX-2 lebih lemah dibandingkan kelompok kontrol. Anava dua jalur dan uji *Kruskal Wallis* menunjukkan perbedaan bermakna antar kelompok ($p<0,05$), menunjukkan bahwa pemberian eugenol berpengaruh terhadap jumlah sel inflamasi dan ekspresi COX-2. Uji *LSD* menunjukkan bahwa jumlah sel inflamasi pada kelompok perlakuan secara signifikan lebih rendah daripada kelompok kontrol pada setiap waktu pengamatan. Uji *Mann Whitney* menunjukkan bahwa ekspresi COX-2 kelompok perlakuan secara signifikan lebih lemah dibandingkan kelompok kontrol pada hari ke-1, 3, 5 dan 7 pasca perlakuan.

Kesimpulan penelitian ini adalah pemberian eugenol pada pulpa gigi tikus *Sprague dawley* yang mengalami inflamasi dapat menurunkan jumlah sel inflamasi dan ekspresi siklooksigenase-2.

Kata kunci: Eugenol, pulpitis, sel inflamasi, ekspresi COX-2.

CYCLOOXYGENASE-2 EXPRESSION AND INFLAMMATORY CELLS INFILTRATION NUMBER AFTER EUGENOL ADMINISTRATION IN IRREVERSIBEL PULPITIS

(An *in vivo* study in *Sprague dawley* rat's molars)

ABSTRACT

Pulpitis is an inflammation of the pulp as a reaction of the pulp tissue to injury. Eugenol is usually used as a temporary medicament to treat pulpitis. The purpose of this research was to study the effect of eugenol on cyclooxygenase-2 (COX-2) expression and inflammatory cells infiltration number in inflamed dental pulp.

Thirty male *Sprague dawley* rats aged 3-4 months and weighed 300-350 g were randomly divided into 2 groups: treatment (15 rats) and control groups (15 rats). Cavity preparation was performed at the occlusal surface of the upper first molar using a round bur No.010 until the pulp was exposed. Eugenol and aquadest were applied using cotton pellet at the bottom of the cavity in the treatmentand control groups, subsequently. The cavities were then filled with cavit. Three rats from each group were sacrificed at 1, 3, 5, 7 and 14 days after the cavity preparation. The upper jaws were decalcified using 10% EDTA, embedded in paraffin and sections serially. The specimens were stained using hematoxylin-eosin to examine the inflammatory cells and immunohistochemistry using anti-COX-2 antibody to examine the expression of COX-2. The number of inflammatory cells was counted under a microscope at 400 times magnification. Cyclooxygenase-2 expression was scored based on its intensity.

The results of the study showed that the treatment group had a lower inflammatory cells infiltration and weaker COX-2 expression compare to the control group. Two-Way ANOVA and Kruskal Wallis tests showed significant differences among groups ($p < 0.05$), indicating that eugenol administration affected inflammatory cells infiltration number and COX-2 expression. LSD test showed that the number of inflammatory cells infiltration in the treatment group was significantly lower than the control group in all observation periods. MannWhitney tests showed that COX-2 expression in the treatment group was significantly weaker compare to the control group 1,3,5,7 days after the treatment.

In conclusion, eugenol administration reduces the number of inflammatory cells infiltration and COX-2 expression in rats' inflamed dental pulp.

Keywords: Eugenol, pulpitis, inflammatory cells, COX-2 expression.