

# Perbandingan kadar Prostaglandin E2 (PGE2) dalam cairan Krevikular Gingiva Anterior Mandibula pasien pada tahap awal perawatan Ortodonti menggunakan braket Self-Ligating pasif dengan braket konvensional Preadjusted MBT = Comparison of Prostaglandin E2 level Gingiva Crevicular Fluid of human anterior mandible during initial alignment between passive Self-Ligating and Conventional Systems

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## Abstrak

**Pendahuluan:** Pergerakan gigi ortodonti akan merangsang terjadinya proses inflamasi sehingga mengeluarkan mediator inflamasi. Prostaglandin E2 (PGE2) adalah salah satu mediator inflamasi yang dikeluarkan selama pergerakan ortodonti dan berperan dalam resorpsi tulang. Proses inflamasi ini terjadi pada semua pergerakan ortodonti termasuk pada penggunaan sistem self-ligating. Walaupun sistem self-ligating diklaim banyak memiliki keuntungan, termasuk efeknya pada ligamen periodontal, akan tetapi belum ada penelitian secara biomolekular yang membandingkan mediator inflamasi dalam ligamen periodontal.

**Metode:** Duabelas pasien dari klinik ortodonti, FKG-UI, dengan kasus nonekstraksi dan indeks iregularitas pada insisif mandibula sebesar 4-9 mm, mendapatkan perawatan ortodonti dengan sistem self-ligating pasif (Damon Q, Ormco) dan sistem konvensional preskripsi MBT (Agile, 3M). Cairan krevikular gingiva diambil dari sisi labial regio insisif mandibula pada 0 jam (sebagai kontrol), 24 jam, dan 4 minggu. Kadar PGE2 diperiksa menggunakan ELISA.

**Hasil:** Walaupun secara statistik tidak terdapat perbedaan kadar PGE2 pada pemakaian braket self-ligating dibandingkan dengan konvensional pada 0 jam, 24 jam ( $p=0,815$ ), dan 4 minggu ( $p=0,534$ ), namun secara deskriptif kelompok selfligating memiliki kadar PGE2 lebih tinggi dari konvensional secara konsisten pada 0, 24jam, dan 4 minggu. Pada waktu 24 jam, kadar PGE2 meningkat dibandingkan saat 0 jam, pada kedua sistem, dan kadar PGE2 pada kelompok self-ligating pasif ( $302,55\pm 26,33$  pg/ mL) lebih besar daripada kelompok konvensional ( $264,43\pm 83,08$  pg/mL). Pada waktu 4 minggu, kadar PGE2 menurun dibandingkan dengan waktu pengambilan 0 jam dan 24 jam, pada kedua kelompok sistem, dan kadar PGE2 pada kelompok self-ligating ( $236,17\pm 42,63$  pg/mL) lebih besar dari kelompok konvensional ( $208,267\pm 81,83$  pg/mL).

**Kesimpulan:** Penelitian kami menyimpulkan bahwa sistem self-ligating memberikan respon selular yang berbeda dibandingkan sistem konvensional.

.....Introduction: Inflammation process, as a result of orthodontic tooth movement, will trigger the release of inflammatory mediator. Prostaglandin E2 (PGE2) is one of the inflammatory mediator that is released during the orthodontic movement and plays an important role in bone resorption. These inflammatory process occurred in all orthodontic movement included in orthodontic treatment using self-ligating system. Although self-ligating system?s advantages have been claimed, including the effect of the system in periodontal ligament, there are still no research in biomolecular level comparing the mediator release in periodontal ligament.

**Objective:** The purpose of this study was to examine PGE2 concentration in gingival crevicular fluid (GCF)

during initial alignment of anterior mandible, using two different system brackets, passive self-ligating and conventional bracket.

Methods: Twelve patients with mandibular incisor irregularities of 4 to 9 mm and prescribed nonextraction cases, from orthodontic clinic, faculty of dentistry, Universitas Indonesia, were having orthodontic treatment. They were divided into 2 groups, each group were using Damon passive self-ligating system (Damon Q, Ormco), and conventionally ligated bracket with MBT's prescription (Agile, 3M). GCF were taken from labial site of mandibular incisors at 0 hour (served as control), 24 hours, and 4 weeks. PGE2 level was determined using ELISA kit.

Results: There was no statistically difference in PGE2 level in self-ligating system group compared with conventional group, at 0, 24 hours, and 4 weeks, but from descriptive view self-ligating group had higher PGE2 levels than conventional at 0, 24 hours, and 4 weeks. At 24 hours, mean of PGE2 level was elevated from 0 hour, in both groups, and mean of PGE2 level was higher in self-ligating group ( $302,55 \pm 26,33$  pg/mL) than conventional group ( $264,43 \pm 83,08$  pg/mL). At 4 weeks, mean of PGE2 level was decrease from 0, and 24 hours in both groups, and mean of PGE2 level was still higher in self-ligating group ( $236,17 \pm 42,63$  pg/mL) than conventional group ( $208,267 \pm 81,83$  pg/mL).

Conclusion: Our findings suggest that self-ligating giving difference cellular response than conventional systems during orthodontic tooth movement