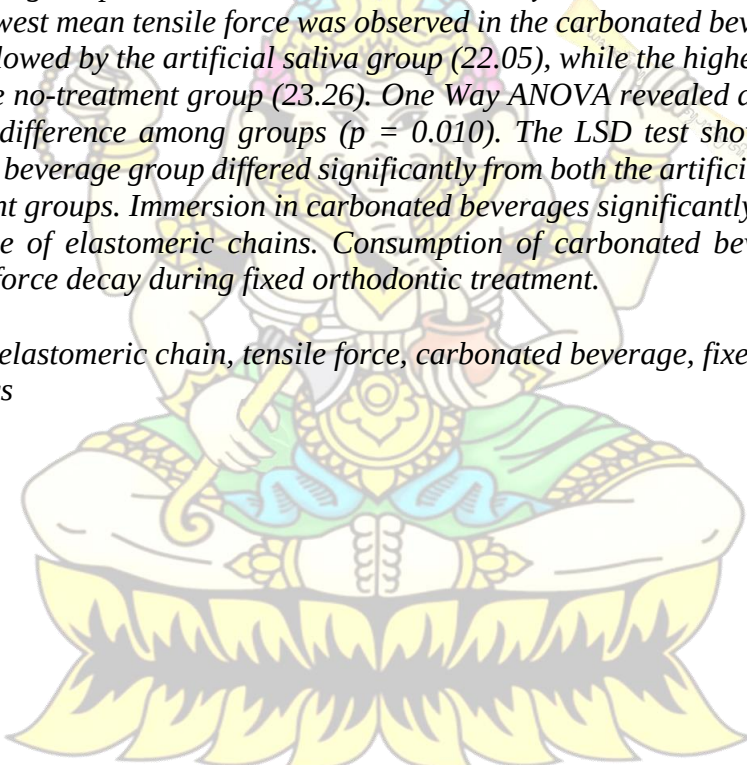


ABSTRACT

Elastomeric chain is an essential component in fixed orthodontic treatment, functioning to deliver tensile force for tooth movement. However, this material is susceptible to force decay due to oral environmental factors, including exposure to acidic carbonated beverages. This study aimed to evaluate the effect of carbonated beverage immersion on the tensile force of elastomeric chains compared to artificial saliva and no immersion. This experimental laboratory study employed a post-test only control group design. Elastomeric chains (American Orthodontic) were divided into three groups: immersion in carbonated beverages, immersion in artificial saliva, and no immersion. Each group was evaluated on days 1, 7, 14, 21, and 28. Tensile force was measured using a Universal Testing Machine. Data were analyzed using Shapiro–Wilk, Levene’s test, One Way ANOVA, and LSD post hoc test. The lowest mean tensile force was observed in the carbonated beverage group (19.39), followed by the artificial saliva group (22.05), while the highest value was found in the no-treatment group (23.26). One Way ANOVA revealed a statistically significant difference among groups ($p = 0.010$). The LSD test showed that the carbonated beverage group differed significantly from both the artificial saliva and no-treatment groups. Immersion in carbonated beverages significantly reduces the tensile force of elastomeric chains. Consumption of carbonated beverages may accelerate force decay during fixed orthodontic treatment.

Keywords: *elastomeric chain, tensile force, carbonated beverage, fixed orthodontics*

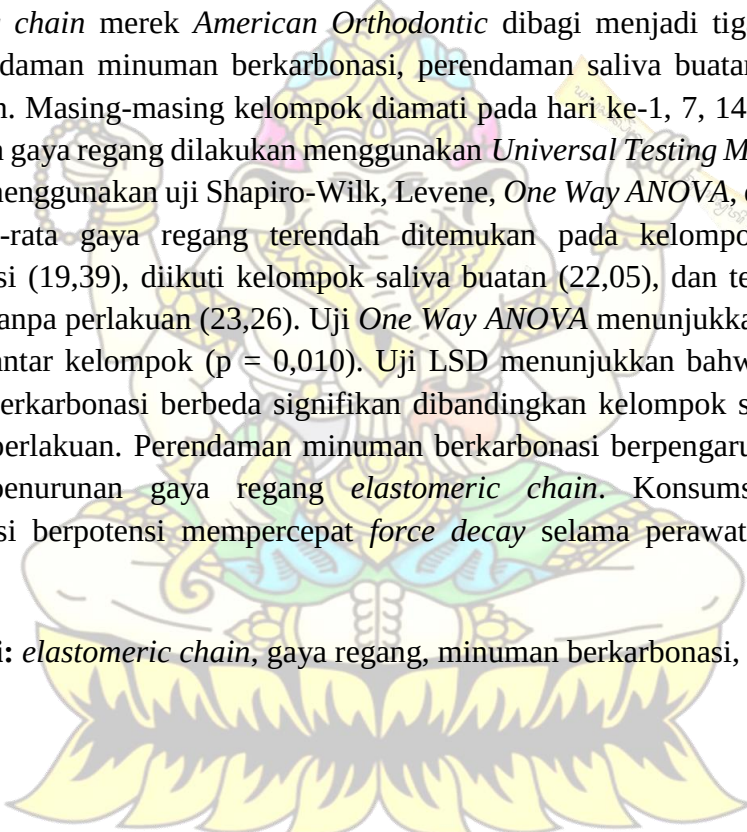


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ABSTRAK

Elastomeric chain merupakan komponen penting dalam perawatan ortodonti cekat yang berfungsi menghasilkan gaya regang untuk pergerakan gigi. Namun, bahan ini rentan mengalami penurunan gaya (*force decay*) akibat pengaruh lingkungan rongga mulut, salah satunya paparan minuman berkarbonasi yang bersifat asam. Penelitian ini bertujuan untuk mengetahui pengaruh perendaman minuman berkarbonasi terhadap gaya regang *elastomeric chain* dibandingkan dengan saliva buatan dan tanpa perlakuan. Penelitian ini merupakan penelitian eksperimental laboratorium dengan desain *post-test only control group design*. Sampel berupa *elastomeric chain* merek *American Orthodontic* dibagi menjadi tiga kelompok, yaitu perendaman minuman berkarbonasi, perendaman saliva buatan, dan tanpa perendaman. Masing-masing kelompok diamati pada hari ke-1, 7, 14, 21, dan 28. Pengukuran gaya regang dilakukan menggunakan *Universal Testing Machine*. Data dianalisis menggunakan uji Shapiro-Wilk, Levene, *One Way ANOVA*, dan uji lanjut LSD. Rata-rata gaya regang terendah ditemukan pada kelompok minuman berkarbonasi (19,39), diikuti kelompok saliva buatan (22,05), dan tertinggi pada kelompok tanpa perlakuan (23,26). Uji *One Way ANOVA* menunjukkan perbedaan bermakna antar kelompok ($p = 0,010$). Uji LSD menunjukkan bahwa kelompok minuman berkarbonasi berbeda signifikan dibandingkan kelompok saliva buatan dan tanpa perlakuan. Perendaman minuman berkarbonasi berpengaruh signifikan terhadap penurunan gaya regang *elastomeric chain*. Konsumsi minuman berkarbonasi berpotensi mempercepat *force decay* selama perawatan ortodonti cekat.

Kata kunci: *elastomeric chain*, gaya regang, minuman berkarbonasi, ortodonti cekat



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