INTISARI

Resin akrilik kuring panas merupakan bahan yang biasa digunakan untuk pembuatan basis gigi tiruan. Nanopartikel silikon dioksida (SiO_2) dapat digunakan sebagai *coating* pada resin akrilik karena dapat mengurangi kekasaran dengan menutup porus mikro dan dapat menurunkan jumlah monomer sisa. Tujuan penelitian ini adalah untuk mengkaji pengaruh nano *silica coating* konsentrasi 0,5%, 1% dan 2% pada basis gigi tiruan resin akrilik terhadap jumlah sel radang dan sel fibroblas.

Sampel terdiri dari 24 plat resin akrilik kuring panas dengan bentuk cakram (diameter 4 mm, tebal 2 mm), dibagi menjadi 4 kelompok (n=6) yaitu kelompok I kontrol (resin akrilik tanpa nano *silica coating*), kelompok II resin akrilik dengan nano *silica coating* konsentrasi 0,5%, kelompok III resin akrilik dengan nano *silica coating* konsentrasi 1%, dan kelompok IV resin akrilik dengan nano *silica coating* konsentrasi 2%. Sampel ditanamkan pada lapisan subkutan punggung tikus wistar selama 14 hari. Perhitungan jumlah sel radang dan fibroblas dilakukan dengan program *imageJ*. Hasil penelitian diuji dengan ANAVA satu jalur, dilanjutkan dengan uji *post hoc* LSD.

Hasil nilai rerata tertinggi sel radang dan sel fibroblas dihasilkan pada kelompok kontrol (tanpa nano *silica coating*). Hasil ANAVA satu jalur menunjukkan terdapat perbedaan bermakna antar kelompok ($p<0,05$). Hasil uji *post hoc LSD* sel makrofag antara nano *silica coating* konsentrasi 0,5% dan 1% terhadap kelompok kontrol menunjukkan perbedaan yang tidak bermakna ($p>0,05$). Hasil uji *post hoc LSD* pada kelompok lainnya menunjukkan terdapat perbedaan bermakna antar kelompok ($p<0,05$). Kesimpulan penelitian ini adalah nano *silica coating* konsentrasi 0,5%, 1% dan 2% pada basis gigi tiruan resin akrilik berpengaruh terhadap penurunan sel radang (makrofag, limfosit, sel plasma) dan sel fibroblas. Nano *silica coating* konsentrasi 2% menghasilkan jumlah sel radang dan sel fibroblas paling rendah.

Kata kunci: nanopartikel *silica*, *coating*, resin akrilik, sel radang, fibroblas

ABSTRACT

Heat cure acrylic resin is a material commonly used for the manufacture of denture bases. Silicon dioxide (SiO_2) nanoparticles can be used as coatings on acrylic resin because they can reduce roughness by closing micropores and can reduce the amount of residual monomer. The purpose of this study was to examine the effect of nano silica coating with a concentration of 0.5%, 1% and 2% on acrylic resin on the number of inflammatory cells and fibroblast cells.

The sample consisted of 24 hot-cured acrylic resin plates with disc shape (4 mm diameter, 2 mm thickness), divided into 4 groups (n=6) namely group I control (acrylic resin without nano silica coating), group II acrylic resin with nano silica coating concentration 0.5%, group III acrylic resin with 1% nano silica coating, and group IV acrylic resin with 2% nano silica coating. Samples were implanted in the subcutaneous layer of the back of wistar rats for 14 days. Calculation of the number of inflammatory cells and fibroblasts was performed using the imageJ program. The results were analized using one-way ANOVA, followed by a post hoc LSD test.

The results of the highest mean value of inflammatory cells and fibroblasts were produced in the control group (without nano silica coating). The results of one-way ANOVA showed that there was a significant difference between groups ($p<0.05$). The results of the post hoc LSD macrophage cell test between nano silica coating concentrations of 0.5% and 1% against the control group showed no significant difference ($p>0.05$). The results of the post hoc LSD test in the other groups showed that there were significant differences between groups ($p<0.05$). The conclusion of this study is that nano silica coating concentrations of 0.5%, 1% and 2% on acrylic resin denture bases have an effect on reducing inflammatory cells (macrophages, lymphocytes, plasma cells) and fibroblast cells. Nano silica coating with a concentration of 2% resulted in the lowest number of inflammatory cells and fibroblasts.

Keywords: silica nanoparticles, coating, acrylic resin, inflammatory cell, fibroblast