ANALISIS EKSPRESI GEN BCL-2 PADA KULTUR SEL PUNCA ADIPOSA MESENKIMAL DENGAN PENAMBAHAN MADU (*Tetragonula sp.*) DAN *ROYAL JELLY* (*Apis mellifera*)

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ABSTRAK

Sel punca adiposa mesenkimal digunakan pada berbagai uji klinis pengobatan pasien. Untuk memberikan tata laksana kepada pasien, sel ini harus dikultur terlebih dahulu pada *Dulbecco's Modified Eagle Medium* (DMEM) dengan suplemen *Fetal Bovine Serum* (FBS). FBS memiliki kekurangan, yaitu dapat terkontaminasi oleh protein prion, endotoksin, berbagai jenis mikroba, immunoglobulin, dan virus. Berdasar komposisinya, madu dan *royal jelly* berpotensi menjadi alternatif FBS. Menurut penelitian sebelumnya, madu *Tetragonula sp.* dan *royal jelly Apis mellifera* dapat menginduksi proliferasi sel, namun belum dikonfirmasi mengenai peristiwa apoptosis. Bcl-2 merupakan penanda peristiwa apoptosis, sebagai anti-apoptosis. Penelitian ini bertujuan menganalisis pengaruh penambahan madu *Tetragonula sp.* dan *royal jelly Apis mellifera* pada DMEM terhadap apoptosis sel punca adiposa mesenkimal melalui ekspresi gen Bcl-2. Penelitian ini menggunakan metode eksperimental murni. Sampel diperoleh dari tindakan *liposuction* pasien dewasa sehat yang dikultur dengan konsentrasi madu dan *royal jelly* 0,05% dan 0,1%, serta FBS 10%, kemudian dilakukan uji *real-time* PCR. Penambahan madu dan *royal jelly* menghasilkan persentase proliferasi sel optimum pada konsentrasi 0,1%, dan tidak mengubah morfologi normal (*spindle-shaped*) dari sel punca adiposa mesenkimal. Ekspresi gen Bcl-2 paling tinggi dihasilkan pada konsentrasi 0,05%, namun pada konsentrasi 0,1% lebih rendah dibandingkan kontrol. Dapat disimpulkan bahwa penambahan madu dan *royal jelly* pada DMEM dan FBS memengaruhi ekspresi gen Bcl-2. Penelitian ini diharapkan dapat menggambarkan kejadian apoptosis yang mengikuti proses proliferasi sel pada penambahan madu dan *royal jelly*.

Kata Kunci: Bcl-2, DMEM, FBS, Madu, *Royal Jelly,* Sel Punca Adiposa Mesenkimal

ANALYSIS OF BCL-2 GENE EXPRESSION IN MESENCHYMAL ADIPOSE STEM CELLS CULTURE WITH THE ADDITION OF HONEY (*Tetragonula sp.*) AND *ROYAL JELLY* (*Apis mellifera*)

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ABSTRACT

Adipose mesenchymal stem cells are used in various clinical trials of patient treatment. To provide treatment to patients, these cells must first be cultured on Dulbecco's Modified Eagle Medium (DMEM) with FBS supplements. Fetal Bovine Serum (FBS) has a disadvantage, it can be contaminated by prion proteins, endotoxins, various types of microbes, immunoglobulins, and viruses. Regarding their composition, honey and royal jelly have the potential to be an alternative to FBS. According to previous studies, *Tetragonula sp.* honey and *Apis mellifera* royal jelly may induce cell proliferation, but the event of apoptosis has not been confirmed. Bcl-2 is a marker of apoptosis, as an anti-apoptosis. This study aims to analyze the effect of *Tetragonula sp.* honey and *Apis mellifera* royal jelly addition in DMEM against adipose mesenchymal stem cell apoptosis through Bcl-2 gene expression. This study used true experimental methods. Samples were obtained from the liposuction procedure of healthy adult patients cultured with honey and royal jelly 0.05% and 0.1% concentrations, as well as FBS 10%, then *real-time* PCR tests were carried out. The addition of honey and *royal jelly* resulted in an optimum percentage of cell proliferation at 0.1% concentration and did not change the normal (*spindle-shaped)* morphology of adipose mesenchymal stem cells. The highest expression of the Bcl-2 gene was obtained at 0.05% concentration, but at 0.1% concentration, the expression was lower than the controls. It can be concluded that the addition of honey and royal jelly to DMEM and FBS influences the expression of the Bcl-2 gene. This study is expected to represent the incidence of apoptosis that follows the process of cell proliferation in the addition of honey and royal jelly.

Keywords: Bcl-2, DMEM, FBS, Honey, *Royal Jelly,* Adipose Mesenchymal Stem Cells