INTISARI

Free gingival graft adalah prosedur pencangkokan jaringan lunak dari palatum dan menjadi *gold standard* perawatan resesi gingiva. Luka yang dihasilkan pasca bedah *free gingival graft* dapat menyebabkan inflamasi berkepanjangan. Obat antiinflamasi saat ini adalah NSAID yang memiliki efek samping. Bahan herbal yang memiliki sifat antiinflamasi diperlukan untuk mengatasi inflamasi berkepanjangan. Kurkumin diketahui memiliki sifat antiinflamasi. *Tocilizumab* merupakan inhibitor sIL-6R (*soluble* IL-6 *receptor*) yang poten, sehingga digunakan sebagai pembanding aktivitas kurkumin. Penelitian tentang aktivitas antiinflamasi kurkumin terhadap IL-6 telah banyak ditemukan, tetapi belum ditemukan mekanisme penghambatan terhadap sIL-6R secara *in silico*. Penelitian ini bertujuan untuk mengetahui apakah kurkumin (*diferuloylmethane*) berpotensi sebagai antiinflamasi pasca bedah *free gingival graft* melalui interaksi kurkumin terhadap sIL-6R secara *in silico*.

Penelitian dilakukan dengan metode *in silico*, yaitu uji interaksi kurkumin terhadap sIL-6R menggunakan komputer. Struktur SMILES senyawa kurkumin, struktur sIL-6R dari PDB, dan struktur SMILES *tocilizumab* digunakan sebagai bahan penelitian. *Molecular docking* dilakukan antara sIL-6R dengan kurkumin untuk melihat *molecular docking score* dan visualisasi hasil serta kemiripan struktur kurkumin dengan *tocilizumab* diuji. Analisis *molecular docking score* dan visualisasi hasil serta analisis kemiripan struktur kurkumin dengan *tocilizumab* dilakukan.

Molecular docking antara sIL-6R dengan kurkumin menunjukkan hasil negatif dan rendah, serta visualisasi hasilnya stabil, sehingga kurkumin berpeluang menjadi inhibitor sIL-6R. Skor kemiripan struktur kurkumin dengan *tocilizumab* menghasilkan angka mendekati 1 yang berarti senyawa kurkumin mirip dengan *tocilizumab* sebagai inhibitor. Berdasarkan hasil penelitian ini, dapat disimpulkan bahwa kurkumin (*diferuloylmethane*) berpotensi sebagai antiinflamasi pasca bedah *free gingival graft* melalui interaksi gugus karbonil kurkumin dengan asam amino sistein dan arginin sIL-6R.

Kata kunci: kurkumin, sIL-6R, antiinflamasi, *molecular docking*

ABSTRACT

A free gingival graft is a soft tissue grafting procedure from the palate and become the gold standard for gingival recession treatment. Wounds after free gingival graft surgery can cause prolonged inflammation. Current anti-inflammatory drugs are NSAIDs with side effects. The herbal ingredients have anti-inflammatory properties are needed to treat prolonged inflammation. Curcumin is known for its anti-inflammatory properties. Tocilizumab is a potent sIL-6R (soluble IL-6 receptor) inhibitor, so it was used to compare the activity of curcumin. Research on the anti-inflammatory activity of curcumin against IL-6 has been found, but no mechanism of *in silico* inhibition of sIL-6R was found. This study aimed to investigate whether curcumin (*diferuloylmethane*) exerts anti-inflammatory effects after free gingival graft surgery through the interaction of curcumin with sIL-6R *in silico.*

Using a computer, the study was conducted using the *in silico* method, namely the interaction test of curcumin against the IL-6 receptor (sIL-6R). Materials used in this research are the SMILES structure of curcumin, the sIL-6R structure of PDB, and the SMILES structure of tocilizumab. Molecular docking was performed between sIL-6R with curcumin to see the molecular docking score and visualization of the results and the similarity of the structure of curcumin to tocilizumab was tested. Molecular docking score analysis and visualization of results as well as structural similarity analysis of curcumin and tocilizumab were carried out.

The molecular docking of sIL-6R and curcumin showed negative and low results, and visualization of the results was stable so that curcumin has the potential to become an inhibitor of sIL-6R. The score of structural similarity between curcumin and tocilizumab results in a score close to 1, which means that the curcumin compound is similar to tocilizumab as an inhibitor. Based on the results of this study, it can be concluded that curcumin (*diferuloylmethane*) has the potential to be anti-inflammatory agent after free gingival graft surgery through the interaction of the carbonyl group of curcumin with the cysteine and arginine amino acids of sIL-6R.

Keywords: curcumin, sIL-6R, anti-inflammatory, molecular docking