

# Pengaruh bone graft hidroksiapatit-gelatin dan propolis terhadap viabilitas sel fibroblas: literature review = Effects of hydroxyapatite-gelatin and propolis bone graft towards fibroblast cell viability: literature review

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## Abstrak

Latar belakang: Material bone graft harus efektif dan aman dengan kualitas baik. Alloplastic graft merupakan salah satu jenis bone graft yang dapat dibuat dari material sintetis seperti hidroksiapatit dan gelatin. Propolis merupakan bahan alami yang berasal dari lebah yang dilaporkan berpotensi dapat mempercepat proses regenerasi tulang dengan cara mengurangi inflamasi dan meningkatkan aktivitas sel melalui bahan aktif CAPE. Oleh karena itu, propolis diharapkan dapat menambah manfaat jika dikombinasikan pada hidroksiapatit-gelatin. Namun, penambahan suatu bahan terhadap material medis sehingga menjadi material medis baru memerlukan uji khasiat dan keamanan dari masing-masing bahan. Salah satu uji keamanan adalah uji sitotoksitas terhadap sel yang mungkin akan berkontak untuk mengetahui biokompatibilitasnya. Tujuan: Mengetahui sitotoksitas bone graft hidroksiapatit-gelatin dan propolis terhadap viabilitas sel fibroblas. Metode: Penyusunan literature review ini dilakukan sepanjang bulan Desember 2020. Pencarian literatur terkait dilakukan melalui 2 electronic database, yaitu PubMed dan Scopus dengan menggunakan kata kunci yang sesuai dengan pertanyaan penelitian. Penentuan kriteria inklusi dilakukan dengan mengikuti alur Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Hasil: Dari hasil penelusuran pustaka maka terpilih 6 literatur. Dua literatur menyatakan bahwa propolis dalam konsentrasi rendah tidak bersifat sitotoksik terhadap sel fibroblas. Satu literatur melaporkan bahwa CAPE dapat meningkatkan viabilitas dan menghambat respons inflamasi sel fibroblas. Satu literatur melaporkan bahwa bahan carbonated hydroxyapatite yang direndam dalam propolis dapat meningkatkan viabilitas sel fibroblas. Dua literatur menyatakan bahwa bone graft hidroksiapatit-gelatin tidak bersifat sitotoksik serta dapat memicu adhesi dan proliferasi sel fibroblas. Kesimpulan: Propolis dan material hidroksiapatit-gelatin sebagai bahan bone graft tidak bersifat sitotoksik terhadap sel fibroblas.

.....Background: Bone graft material must be effective and safe with good quality. Alloplastic graft is a type of bone graft that can be made from synthetic materials such as hydroxyapatite and gelatin. Propolis is a natural material derived from bees which is reported to have the potential to accelerate the bone regeneration process by reducing inflammation and increasing cell activity through the active ingredient CAPE. Therefore, it is expected that propolis can add benefits when combined with hydroxyapatite-gelatin. However, the addition of an ingredient to a medical material so that it becomes a new medical material requires a test of the efficacy and safety of each ingredient. One of the safety tests is the cytotoxicity test of cells that may come into contact to determine biocompatibility of the material. Objective: To determine the cytotoxicity of hydroxyapatite-gelatin and propolis bone graft towards fibroblast cell viability. Methods: This literature review was conducted throughout December 2020. The search for related literature was done through 2 electronic databases, PubMed and Scopus, using keywords that match the research question. The determination of the inclusion criteria was carried out by following the flow of Preferred Reporting Items

for Systematic Reviews and Meta- Analyses (PRISMA). Results: From the literature search results, six literatures were selected. Two literatures state that propolis in low concentrations is not cytotoxic against fibroblast cells. One literature suggests that CAPE can increase viability and inhibit the inflammatory response in fibroblasts. One literature reports that carbonated hydroxyapatite soaked in propolis can increase the viability of fibroblasts. Two literatures state that hydroxyapatite-gelatin bone graft is not cytotoxic and can promote adhesion and proliferation of fibroblast cells. Conclusion: Propolis and hydroxyapatite-gelatin material as bone graft materials are not cytotoxic to fibroblast cells.