

# Kemampuan diferensiasi osteogenik sel stromal pulpa gigi pasien celah bibir dan palatum melalui ekspresi gen osteopontin = Osteogenic differentiation ability of dental pulp mesenchymal stromal cell from cleft lip and palate through expression of osteopontin gene

Insyirah Nabil Nismara, author

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## Abstrak

Latar belakang: Celah bibir dan palatum (CLP) adalah kegagalan fusi prosesus frontonasal dan maksilaris yang menghasilkan celah yang meluas ke bibir, alveolus, dasar hidung, dan palatum keras maupun lunak. Diperlukan perawatan melalui teknik rekayasa jaringan dengan menggunakan sel stromal mesenkim yang dapat ditemukan pada dental pulp stromal cells (DPSC). Kemampuan osteogenik DPSC dapat dilihat melalui deteksi marker osteogenik seperti osteopontin (OPN). Osteopontin merupakan salah satu marker utama diferensiasi osteogenik yang diproduksi oleh osteoblas dalam proses pembentukan dan mineralisasi tulang. Pada pasien CLP diketahui perbedaan ekspresi gen yang dapat memengaruhi sintesis matriks ekstraseluler. Penelitian ini dilakukan untuk mengetahui kemampuan diferensiasi osteogenik melalui ekspresi marker osteopontin saat diferensiasi osteoblas pada pasien celah bibir dan palatum. Tujuan: Membandingkan kemampuan diferensiasi osteogenik sel stromal pulpa gigi subjek normal dengan sel stromal pulpa gigi pasien celah bibir dan palatum melalui ekspresi gen osteopontin. Metode: Sampel RNA yang diperoleh dari kultur sel pulpa gigi subjek normal dan pasien celah bibir dan palatum diuji dengan Real-Time Polymerase Chain Reaction (RT-PCR) dengan primer osteopontin (OPN) dan 18S sebagai housekeeping gene. Hasil: Tidak terdapat perbedaan antara ekspresi relatif gen OPN sel stromal pulpa gigi subjek normal dan pasien celah bibir dan palatum. Kesimpulan: Kemampuan diferensiasi osteogenik sel stromal pulpa gigi pada pasien celah bibir dan palatum ekuivalen dengan sel stromal pulpa gigi pada subjek normal.

.....Background: Cleft lip and palate (CLP) occurs due to the failure of fusion of the frontal and maxillary process that results in a cleft that extends to the lip, alveoli, nose floor, and hard and soft palate. One of the potentially alternative treatment for CLP cases is tissue engineering technique using Mesenchymal Stromal Cell (MSC). MSC can be found in dental pulp stromal cells (DPSC). Osteogenic ability can be seen through the detection of osteogenic markers such as osteopontin (OPN). Osteopontin is one of the main markers of osteogenic differentiation produced by osteoblast in the process of bone formation and mineralization. Osteopontin is expressed by preosteoblasts in early bone formation and mature osteoblasts at bone remodelling sites. Osteopontin expression as one of osteogenic markers in cleft lip and palate patients is unknown. This study was conducted to determine the ability of osteogenic differentiation through the expression of osteopontin in cleft lip and palate patients. Objective: To compare osteogenic differentiation ability of mesenchymal stromal cells in cleft lip and palate patients and normal subject through the expression of osteogenic marker osteopontin. Methods: RNA sample that was obtained through RNA extraction from dental pulp stromal cells of cleft and lip palate patients and normal subjects were tested with Real-Time Polymerase Chain Reaction (RT-PCR) using osteopontin and 18S as housekeeping gene. Results: There was no difference between the relative expression of OPN gene in DPSC from normal subject and cleft lip and palate patients. Conclusion: Osteogenic differentiation ability of dental pulp stromal cells from

cleft lip and palate patients is equivalent with dental pulp stromal cells from normal subjects.