

Potensi Asam Amino L-Arginine Berbagai Konsentrasi terhadap Proliferasi Human Dental Pulp Stem Cells (hDPSCs) = Potential Use of Amino Acid L-Arginine Towards Human Dental Pulp Stem Cells (hDPSCs) Proliferation

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Abstrak

Latar Belakang: Pada kondisi inflamasi pulpa, terdapat penurunan dari jumlah protein dan asam amino. L-Arginine adalah asam amino semi-esensial karena berperan penting pada kondisi tertentu, gangguan imun berat dan luka bakar, yang membutuhkan asupan tambahan L-Arginine eksternal. Asam amino L-Arginine menjadi satu-satunya substrat sintesis nitric oxide (NO) dan poliamina berasal dari konversi L-Arginine menjadi ornithinen melalui arginase. NO dan poliamina merangsang proliferasi sel dan memiliki efek positif pada perkembangan melalui siklus sel. Tujuan: Mengetahui potensi asam amino L-Arginine terhadap proliferasi hDPSCs. Metode: Evaluasi asam amino L-Arginine konsentrasi 300, 400, 500 mol/L, serta DMEM sebagai kontrol terhadap proliferasi hDPSCs menggunakan uji cell count setelah 24 jam. Analisis statistik menggunakan Oneway ANOVA dengan post hoc Bonferroni. Hasil: Terdapat perbedaan bermakna potensi L-Arginine 300,400 dan 500 mol/L dibandingkan kontrol, dan L-Arginine 500 mol/L memiliki rerata proliferasi hDPSCs paling tinggi sebesar 436.666 sel/ml. Kesimpulan: Asam amino L-Arginine memiliki potensi terhadap proliferasi hDPSCs dan proliferasi tertinggi pada asam amino L-Arginine konsentrasi 500 mol/L.

.....Background: In the inflammatory condition of the pulp, there is a decrease in the amount of protein and amino acids. L-Arginine is a semi-essential amino acid because it plays an important role in certain conditions, severe immune disorders and burns, which require additional intake of external L-Arginine. The amino acid L-Arginine is the sole substrate for the synthesis of nitric oxide (NO) and polyamines derived from the conversion of L-Arginine to ornithine via arginase. NO and polyamines stimulate cell proliferation and have a positive effect on progression through the cell cycle. Objective: To determine the potential of L-Arginine amino acid on the proliferation of hDPSCs. Methods: Evaluation of L-Arginine amino acid with concentrations of 300, 400, 500 mol/L, and DMEM as a control for hDPSCs proliferation using cell count test after 24 hours. Statistical analysis using Oneway ANOVA with Bonferroni post hoc. Results: There was a significant difference in the potency of L-Arginine 300,400 and 500 mol/L compared to control, and L-Arginine 500 mol/L had the highest average proliferation of hDPSCs of 436.666 cells/ml. Conclusion: The amino acid L-arginine has the potential to proliferate hDPSCs and the highest concentration at 500 mol/L.