

Hubungan antara kadar Insulin-like Growth Factor-1 Saliva dengan kemampuan kognitif anak stunting usia 6-8 tahun = Relationship between Insulin-like Growth Factor-1 levels in Saliva with cognitive ability of stunting children at 6-8 years of age

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Abstrak

Latar Belakang: Prevalensi Stunting di Indonesia masih lebih tinggi dari yang ditetapkan oleh WHO. Stunting menyebabkan defisit pertumbuhan fisik anak untuk usianya, serta defisit kinerja kognitif dan akademik jangka pendek maupun jangka Panjang. Telah dilaporkan adanya hubungan antara kondisi stunting dengan penurunan kadar IGF-1, serta hubungan antara kadar IGF-1 dengan perkembangan kognitif. Pengukuran kadar IGF-1 yang dikaitkan dengan pertumbuhan dan perkembangan lazim dilakukan pada IGF-1 darah. Diketahui bahwa saliva mengandung biomarker yang terkandung di dalam darah, termasuk IGF-1, dalam kuantitas yang jauh lebih rendah. Tujuan: Menganalisis hubungan antara kadar IGF-1 saliva dengan kemampuan kognitif dan status gizi stunting pada anak-anak usia 6-8 tahun. Metode: Sampel saliva merupakan sediaan biologis tersimpan dari penelitian tahun 2019 pada populasi siswa/i sekolah dasar (SD) kelas 1-2 Kecamatan Nangapanda, Ende, Nusa Tenggara Timur yang telah dikelompokkan berdasarkan status gizi stunting dan normal. Sampel saliva diuji menggunakan Bradford assay untuk melihat jumlah total proteinnya, setelah itu sampel diuji menggunakan ELISA kit human IGF-1 untuk melihat kadar IGF-1. Perkembangan kognitif dinilai berdasarkan skor Raven's Colored Progressive Matrices. Analisis data menggunakan SPSS. Hasil: Dalam penelitian ini, total protein saliva anak normal 824,47 mg/ml dan pada anak stunting 879,45 mg/ml. Kadar IGF-1 saliva anak normal 7,50 ng/ml dan pada anak stunting 5,64 ng/ml. tidak berbeda bermakna. Proporsi IGF-1 terhadap total protein anak normal $1,04 \times 10^{-2}$ dan pada anak stunting $8,96 \times 10^{-3}$. Tidak ada perbedaan signifikan proposi kadar IGF-1 saliva antara anak normal dan stunting ($p > 0,05$), dan antara skor perkembangan kognitif anak normal 4,53 dan pada anak stunting 3,04. Korelasi antara variabel adalah sebagai berikut: korelasi positif sangat lemah antar kadar IGF-1 dengan status gizi ($r = 0,147$), korelasi positif sangat lemah antar skor perkembangan kognitif dengan status gizi ($r = 0,192$), tidak ada korelasi antar kadar IGF-1 dengan skor perkembangan kognitif ($r = -0,034$). Kesimpulan: Pada anak stunting usia 6-8 tahun yang kadar IGF-1 saliva dan perkembangan kognitifnya tidak berbeda bermakna dengan anak normal, masih terlihat bahwa kondisi stunting berhubungan dengan penurunan kognitif, dan bahwa penurunan kadar IGF-1 saliva dapat mengindikasikan kondisi stunting tetapi tidak berhubungan dengan penurunan perkembangan kognitifnya.

.....Background: The prevalence of Stunting in Indonesia is still higher than what had been determined by WHO. In addition to a deficit in a child's stature for their age, stunting has also been associated with short- and long-term deficit in cognitive and academic performance. It had been reported that there were correlations between stunting with decreased IGF-1 level and cognitive impairment. The measurement of IGF-1 level in these studies were taken from blood. Saliva contains significantly lower concentration of biomarkers that are present in blood. Objective: Analyzing the relationship between salivary IGF-1 levels with cognitive abilities and nutritional status in stunted children aged 6-8 years. Method: Saliva were taken from stored biological specimen derived from a research in 2019 at students grades 1-2 elementary schools

in Nangapanda, Ende, East Nusa Tenggara, and then grouped based on stunting and normal nutritional status. Saliva samples were tested using the Bradford assay to measure the total amount of protein, the levels of IGF-1 were tested using the human IGF-1 ELISA. The cognitive development scores were measured using Raven Colored Progressive Matrices. The data were analyzed using SPSS. Result: In this study, total protein in normal children 824,47 mg/ml and in stunted children 879,45 mg/ml. Salivary IGF-1 levels in normal children 7,50 ng/ml and in stunted children 5,64 ng/ml. Proportion Salivary IGF-1 to total protein in normal children $1,04 \times 10^{-2}$ and in stunted children $8,96 \times 10^{-3}$. There was no significant difference between normal and stunted children. Cognitive development scores in normal children 4,53 and in stunted children 3,04. The correlations between variables were as follows: very weak positive correlation between IGF-1 levels and nutritional status ($r=0.147$), very weak positive correlation between cognitive development scores and nutritional status ($r = 0.192$), no correlation between IGF-1 levels and cognitive development scores ($r = - 0.034$). Conclusion: In stunted children aged 6-8 years whose salivary IGF-1 levels and cognitive development score were not significantly different from normal children, there was still an indication that stunting was associated with cognitive decline, and that a decrease in salivary IGF-1 levels could develop stunting conditions but was not associated with decline in cognitive development.