Relationships between human milk oligosaccharides profiles and weight growth indicators of infants aged 0–4 months - a prospective longitudinal study = Hubungan profil human milk oligosaccharides dengan indikator pertumbuhan berat badan bayi usia 0-4 bulan - studi prospektif longitudinal

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Abstrak

Human Milk Oligosaccharides (HMO), adalah kelompok senyawa ketiga terbanyak dalam ASI dan berhubungan dengan pertumbuhan bayi. Studi prospektif longitudinal dilakukan pada 120 pasangan ibu-bayi berusia 0 – 4 bulan dari RS Kemang Medical Care, Puskesmas Cilandak, Mampang, Pasar Minggu dan Tebet di Jakarta Selatan antara Agustus 2021 – Mei 2022.
Analisis gen dilakukan dengan Next Generation Sequencing (NGS) dan Sanger. Profil HMO (2'FL, LNFP I, LNT, LNnT, 3'SL dan 6'SL) diperiksa pada usia 0, 2, 4 bulan. Weight for age zscore (WAZ), weight for length z-score (WLZ), dan weight velocity diperiksa setiap bulan. Penelitian ini menggunakan uji korelasi Pearson dan Spearman, uji Anova untuk pengukuran berulang, Friedman tes, regresi logistik dan model linier umum untuk pengukuran berulang dengan nilai p <0,05 dianggap signifikan secara statistik.
Sekretor positif dalam penelitian ini sebanyak 58,3% dan 41,7% sebagai Sekretor lemah. Prevalensi Lewis positif sebesar 85% dan 15% adalah Lewis negatif, sama dengan prevalensi Group 1 (Se+Le+) dan Grup 3 (Se+Le-). Kkonsentrasi 2’FL pada kelompok Se+Leberkorelasi negatif dengan WAZ dan berkorelasi positif dengan LNFP I (r0,478) usia dua bulan (r-0,294). 2’FL pada ibu Sekretor positif berkorelasi negatif dengan WAZ bulan kedua (r-0,294).
2’FL, LNFP I dan LNT memiliki hubungan positif dengan indikator pertumbuhan berat badan.
.....Human Milk Oligosaccharides (HMOs) are the third most abundant group of compounds in human milk. HMOs can modulate the immune system of the intestinal mucosa, modulate infection and allergy, and link to growth in early infancy. A prospective longitudinal study was conducted among 120 mother-infant pairs aged 0 – 4 months from Kemang Medical Care Women and Children Hospital, Public Health Center in Cilandak, Mampang, Pasar Minggu, and Tebet in South Jakarta between Agustus 2021 – May 2022. The gene analysis for the Secretor and Lewis status of the mother were performed by usung Targeted Next Generation Sequencing (NGS) and Sanger at baseline. The HMOs profiles (2'FL, LNFP I, LNT, LNnT, 3'SL, and 6'SL), breast milk calories, and fat were examined at 0, 2, and 4 months. Weight growth indicators, namely weight for age z-score, weight for length z-score (WAZ, WLZ, and weight velocity), infection episode, and mother's body mass index (BMI) were examined every month. Data were analyzed using Pearson or Spearman correlation test (correlation coefficient), general linear model for repeated measures ANOVA test and Friedman test (mean difference between and within groups, respectively) and logistic regression unadjusted OR (association between dependent and independent variables), with a p-value <0.05 considered statistically significant.
The positive and weak Secretor mothers were 58.3% and 41.7%, respectively. The proportion of Lewis positive and Se+LE+ groups was 85%, while 15% were in Lewis negative and Se+Legroup. At baseline, 2'FL concentration among Se+Le- mothers were negatively correlated with WAZ and LNFP I (r0.478)

concentration was positively correlated with infants' WLZ. The 2'FL concentration among Secretor mothers was negatively correlated with infants' WAZ in the second month (r-0.294). Mothers with high 2'FL levels increased the standard deviation of infants' WLZ in the fourth month. Infants' weight velocities were higher among high LNT and 3'SL levels in the second month; and in high 2'FL and LNFP I mothers in the fourth month. HMOs profile (2’FL LNT, LNFP I and 3’SL) of the lactating mothers have a positive relationship with weight growth indicator and innovative intervention to improve HMOs concentration among mothers should be consider as one of the ways to improve infants growth.