Changes in preterm breast milk composition according to lactation time and maternal characteristics

Chiara **Lasagna** [1], Meta **Starc** [2], Anna **David** [1], Antonella **Trappan** [2], Jenny **Bua** [2], Giulia **Zamagni** [2], Riccardo **Addobbati** [2]

[1] Università degli Studi di Trieste, Trieste, Italy.
[2] Institute of Maternal and Child Health IRCCS "Burlo Garofolo", Trieste, Italy.

DOI: 10.36129/jog.2024.S135

Objective. The purpose of this prospective, longitudinal, single centre, observational study was to measure the macronutrient (energy, protein, fat, carbohydrate) composition of breast milk (BM) shown in mothers delivering preterm infants, to evaluate the changes over time and the correlation with maternal characteristics.

Materials and Methods. Mothers of babies born between 24 and 32+6 gestational age (GA) who exclusively or partially breastfeed their babies were enrolled in the study, and milk samples from 24-h collections were analysed twice weekly with mid-infrared transmission spectroscopy (MIRIS milk analyser), from the commencement of significant enteral nutrition (100 ml/kg/day) until discharge.

Results. 39 women were enrolled, and 351 milk samples were analysed. Protein content decreased significatively over time (0.05 g/dl per week), as well as lipid and energy content. Variation in carbohydrates was not significant. A wide inter-individual variability was found. Pre-pregnancy BMI was significatively correlated with BM lipid and carbohydrate content. Lower birthweight was correlated with an increased BM protein content, while this correlation was not found for lower gestational ages. Pre-eclampsia was significatively correlated with increased lipid (0.67 g/dl), protein (0.17 g/dl) and energy content (6.67 kcal/dl). A slight increase in protein content was also noted in nulliparous women (0.1 g/dl). Twin pregnancy, *in vitro* fertilisation, maternal age, gestational diabetes, infections during pregnancy, steroid prophylaxis, and smoking habits did not influence BM composition.

Conclusions. BM composition varies over time and there is a wide inter-individual variation. Some factors, such as pre-eclampsia, pre-pregnancy BMI, nulliparity, and lower birthweight are significatively correlated with macronutrient content.