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## ABS 1

### MATERNAL FACTORS ASSOCIATED WITH EARLY POSTNATAL WEIGHT LOSS IN EXCLUSIVELY BREASTFED NEONATES

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## INTRODUCTION

Neonatal hyperbilirubinemia is a common problem and is of concern for both pediatricians and parents. Excess of postnatal body weight loss enhances enterohepatic circulation and then influences bilirubin decline. This study aims to elucidate the particular maternal factors that affect excess body weight loss in exclusive breastfed neonates.

## METHODS

We conducted a retrospective cohort study in National Taiwan University Hospital from Jan. 1, 2014 to Dec. 31, 2014. We included newborns fulfilling the following criteria: exclusively breastfed, single birth, gestational age  $\geq 37$  weeks, and birth weight (BW)  $\geq 2,500$  grams. We excluded the neonates who required treatment for disease other than hyperbilirubinemia and whose mother required admission to intensive care unit. Excess of postnatal weight loss was defined as losing  $\geq 7\%$  of BW in the first 48 hours of life or  $\geq 10\%$  of BW anytime.

## RESULTS

A total of 406 mother-neonate pairs were collected. Mean body weight loss at age 24, 48, 72, 120 hours was  $5.04\% \pm 2.25\%$ ,  $8.34\% \pm 1.50\%$ ,  $9.06\% \pm 2.46\%$ ,  $7\% \pm 2.81\%$  of BW. Forty-four percent of babies had excess weight loss. Neonates with more weight loss had higher serum bilirubin level.

In general, neonates who were born via cesarean section and whose mother had delayed onset of lactation had more body weight loss ( $p < 0.0001$ ). Among vaginal delivery group, maternal blood loss during delivery and delayed onset lactation ( $p < 0.0001$ ) were associated with excess body weight loss. Among cesarean section group, advanced maternal age, mother's weight before delivery, male babies and delayed onset of lactation were significantly associated with excess neonatal body weight loss.

## CONCLUSIONS

No matter vaginal delivery or cesarean section, delayed onset of lactation was significant associated with neonatal excess body weight loss. Therefore, evaluating mother's lactation condition was very important. Early recognition and nursery intervention could prevent babies' excess body weight loss and further condition of dehydration.

## ABS 2

### USE OF INSULIN ON PRETERM NEONATES: A GOOD IDEA?

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## BACKGROUND

A glucose infusion rate (GIR) of 5-8 mg/kg/min is considered to be normal for term neonates. The GIR needed to optimize nutrition in neonates is 14 mg/kg/min. The use of insulin in preterm neonates has been debatable among clinicians. Studies have previously confirmed that although risks are present with use of insulin in preterm neonates, there are potential benefits in reducing the symptoms of hyperglycaemia while improving nutrition for preterm neonates.

## AIMS

The aim of this study was to look at the glucose infusion rate in babies who required insulin.

## METHODS

Babies were identified using BadgerNet online system for the year 2015.

## RESULTS

A total of 34 babies' notes were reviewed. The mean gestational age of these babies was 27 weeks (23-41 weeks) and the mean weight was 1,202 grams (450-3,250 grams). 55% of the neonates (19 babies) were under 27 weeks' gestation (extremely preterm) and 70% weighed less than 1,000 grams.

23 of these babies had a glucose infusion rate of less than 8 mg/kg/minute. Of these babies, 9 babies were extremely preterm. Only 1 baby had a GIR of more than 10.

### CONCLUSIONS

Adequate nutrition is important in preterm babies. There is a divide amongst neonatal units in the use of insulin in preterm neonates. This study shows that preterm neonates have been found to have high glucose levels despite appropriate GIR. Therefore, the insulin should be considered in management of hyperglycaemia.

### ABS 3

#### RISK FACTORS OF DELAYED ONSET OF LACTATION ASSOCIATED NEONATAL TO HYPERBILIRUBINEMIA

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### INTRODUCTION

Most neonates receive exclusive breastfeeding nowadays, but maternal delay of lactation may cause breastfeeding failure and jaundice. In this study, we focus on maternal risk factor of delayed onset of lactation.

### METHODS

We reviewed the medical records in National Taiwan University Hospital from 2014/01/01 to 2014/12/03. We collected the neonates in baby room who were exclusively breastfed, single birth, gestational age  $\geq 37$  weeks and birth weight of  $\geq 2,500$  grams. We excluded neonates who required treatment for diseases other than hyperbilirubinemia and whose mother required treatment in the intensive care unit. The nurses classified the lactation in four grades during hospitalization; delayed onset of lactation was defined as absence of the highest grade of lactation in the first 3 days. Their demographic characteristics, and their maternal factors including antenatal, perinatal, and postnatal information, were collected for our analysis of the excess neonatal body weight risk.

### RESULTS

In this study, we included a total of 406 mother-neonate pairs from 1,838 neonates admitted to baby room that fulfilled the above criteria. Delayed onset of lactation was a significant factor associated with neonatal hyperbilirubinemia ( $p < 0.0001$ ); excess body weight loss and longer stage III labor duration were associated with delayed onset of lactation. In cesarean section group, higher BMI before delivery, more body weight gain during pregnancy, primipara status, unexpected cesarean section, higher intravenous solution receiving before delivery were associated with prolonged onset of lactation.

### CONCLUSIONS

The neonates whose mother had delayed onset of lactation had higher risk of excess body weight loss and hyperbilirubinemia. We found several maternal factors contributing to delayed onset of lactation. How to promote maternal lactation is an important issue to decrease the incidence of neonatal hyperbilirubinemia.

### ABS 4

#### NUTRITIONAL MANAGEMENT PRACTICE AND POSTNATAL GROWTH OF PRETERM INFANTS

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### BACKGROUND

A widely accepted attitude is that the nutritional management of preterm infants, especially of extremely preterm (EPT) infants, should support a growth at a rate that approximates the rate of intrauterine growth. Despite this aim, extra uterine growth restriction (EUGR) continues to be frequent in majority of EPT infants.

### AIMS

The aim of this study was to analyze postnatal weight gain of preterm infants depending on gestational age, time of initiation of enteral feeding and also type of enteral nutrition (preterm formula vs. fortified mother milk).

### METHODS

This study included 105 preterm infants with gestational age (GA) between 24 and 36 weeks, admitted to NICU immediately after birth. Whole group is stratified according to gestational age in three subgroups: preterm infants' with GA  $\leq 28$  gestational

weeks (n = 30), GA 29-32 weeks (n = 45) and GA 33-36 (n = 30) weeks. Exclusion criteria for this study were: presence of major congenital anomalies and incomplete medical history. A standardized protocol for feeding preterm infants was used. Statistical evaluation included birth weight, body weight at 14<sup>th</sup> and 28<sup>th</sup> day after birth, and at the time of discharge, time of commencement of enteral feeding, type of milk (fortified mother milk or formula milk), and time to reach a full enteral feeding.

#### RESULTS

Although EPT infants did not present significant weight loss, 26% of EPT infants had a weight  $\leq$  10<sup>th</sup> percentile of the expected intrauterine growth for the postmenstrual age (PMA) at the time of discharge; average time to achieve full enteral feeding in infants  $\leq$  28 GA was 25 days, comparing to infants GA 29-32 and GA 33-36, in which average time was 12 and 11 days, respectively. Early initiation of enteral feeding and feeding with fortified mother milk had a positive impact on weight gain of preterm infants.

#### CONCLUSIONS

Postnatal growth rate of preterm infants depends not only on conditions affecting growth but also on nutritional management practice. Achieving optimal postnatal growth rate and preventing EUGR is crucial, since it improves long term outcome of preterm infants.

#### ABS 5

### BREAST MILK EXPRESSION AT THE NICU: EXPERIENCES OF MOTHERS EXPRESSING AT THEIR PRETERM INFANT'S BEDSIDE OR IN A BREAST MILK EXPRESSION ROOM

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#### INTRODUCTION

Breast milk expression at the preterm infant's bedside is recommended to promote breast milk production. However, there is limited evidence supporting this intervention and only a very few studies report on mothers' experiences of breast milk expression at their preterm infant's bedside. This pilot study with a mixed-method evaluation aims to assess mothers'

acceptability of breast milk expression at their preterm infant's bedside, explore their experiences, and compare them to those of mothers expressing in a room reserved for this purpose.

#### METHODS

Forty mothers of preterm infants < 30 weeks of gestation admitted to a Canadian Neonatal Intensive Care Unit (NICU) were recruited and randomly assigned to breast milk expression at their preterm infant's bedside in an open-bay unit (experimental group) or in a room (control group). After a three-week period, mothers' acceptability and experiences were evaluated through questionnaires and individual semi-structured interviews with open-ended questions. Interviews were recorded and transcribed for conventional content analysis.

#### RESULTS

Preliminary results show that both conditions are acceptable. Mothers expressing at their preterm infant's bedside report that it maximizes their presence at the bedside and promotes their physical and emotional closeness, attachment, and involvement in care. The NICU stressful environments, as well as the lack of space and intimacy, are identified as the most difficult aspects of their experiences. Mothers in the control group appreciate the intimacy, comfort and tranquility of the room, but deplore its limited availability. They also report being worried about missing medical rounds and important information.

#### CONCLUSIONS

This pilot study has the potential to contribute to knowledge development on breast milk expression at the NICU, enlighten clinical practice, and guide future research on the support of breast milk production in mothers of preterm infants.

#### ABS 6

### RELIABILITY OF THE OM-6050 OSMOMETER STATION TO ANALYSE THE OSMOLARITY OF FORTIFIED BREAST MILK

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#### BACKGROUND

Breast milk is the best aliment for every newborn. In very preterm babies or in babies with birth

weight less than 1,500 g, breast milk does not provide all the necessary nutrients, so we usually must add fortifiers, which can increase the osmolarity of the aliment. Osmolarity higher than 400-450 mOsm/L is associated with increased gastroesophageal reflux and/or necrotizing enterocolitis. There is not any validated method to measure the osmolarity in the fortified breast milk. Our aim was to validate the reliability of OM-6050 Osmometer Station (A. Menarini Diagnostics) analyzing the osmolality in fortified breast milk.

#### METHODS

We used mature breast milk (more than 15 days after birth) like sample. To a volume of 20 mL was added 5% of fortifying measured with a precision scale. The mixture was homogenized with a magnetic mixer for 5 minutes. The analysis of osmolarity was performed by Station OM-6050 analyzer, based on ultra cooling method. The samples were analyzed at 0, 8 and 24 hours after preparation, performing 12 reruns at each time. Reliability was studied calculating the coefficient of variation (CV).

#### RESULTS

The CV was 2.9%, 2% and 1.7% at 0, 8 and 24 hours respectively. The average CV was 2.2%, less than 10% that is recommended for all diagnostic methods.

#### CONCLUSIONS

The OM-6050 Osmometer Station is reliable to study the osmolarity of the fortified breast milk. Knowing the osmolarity of the fortified breast milk could be useful to assess its possible association with different pathologies.

#### ABS 7

### MICROBIOTA OF TERM INFANTS DELIVERED VAGINALLY VS. CESAREAN SECTION – INFLUENCE OF HOME ENVIRONMENT

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#### INTRODUCTION

Intestinal microbiota plays important role in child physical development, immune system modulation and resistance to certain diseases from the very

first minutes of life or even from conception. Mode of delivery has been shown to have crucial effect on gut bacterial portfolio. Numerous studies have shown that children born by cesarean section (CS) have altered gut microbiota and are more likely to develop allergy, atopy, asthma and type 1 diabetes later in life. It is not known how long these changes persist and whether gut colonization can be modified soon after birth. The goal of the study was to assess the impact of the home environment on gut colonization in term infants delivered vaginally or by CS.

#### METHODS

We included 16 full term newborns, 8 vaginally- and 8 CS-delivered, and none received antibiotics. Quantitative real-time polymerase chain reaction (qPCR) for determination of *Bifidobacterium spp.*, *Bacteroides spp.*, *F. prausnitzii*, *A. muciniphila* and total bacterial count (TBC) was used. Microbiological culture for determination of *E. coli*, *Enterococcus spp.*, *Proteus spp.*, *Pseudomonas spp.*, Enterobacteriaceae, *Clostridium spp.*, *Lactobacillus spp.* and Yeasts was used. All analyses were performed in meconium and in stools 6 weeks after discharge home. Statistical analyses were performed using Mann Whitney U Test.

#### RESULTS

The mean birth weight (SD) and gestational age (SD) was 3,689 g ( $\pm$  605.7) and 39.1 weeks ( $\pm$  1.4), respectively. None of meconium was sterile as we found bacterial DNA in all of meconium samples. Intestinal colonization of newborns born by CS was delayed. We found significant differences in types of bacteria in meconium in the groups delivered vaginally versus CS. There were more *E. coli*, *Enterococcus spp.* and total number of bacteria in vaginally delivered group compare to CS-delivered group ( $p = 0.038$ ,  $p = 0.010$ ,  $p = 0.028$ , respectively). Six weeks after discharge from hospital the types of particular bacteria were not different between two groups; however, we found lower overall bacterial counts in CS-delivered group ( $p = 0.028$ ).

#### CONCLUSIONS

The colonization of term newborns born by CS is altered on the first day of life. The succession of microorganisms does not include important species like *E. coli* and *Enterococcus spp.* After 6 weeks in the home environment the differences between certain types of bacteria disappeared; however, total bacterial count in the CS group remained lower.

## ABS 8

## FACTORS INFLUENCING BREASTFEEDING OF PREMATURE NEWBORNS

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## INTRODUCTION

Breast milk is reputed the ideal food for premature newborns. In order to improve breastfeeding rates for premature newborns, it is important to determine factors influencing breastfeeding in these newborns.

## OBJECTIVE

To determine factors related to childbirth, newborn and mother and evaluate their influence on breastfeeding rates in premature newborns.

## METHODS

In February-November 2015, an anonymous survey of mothers having delivered premature newborns was carried out in the Departments of Neonatology of Kaunas Clinics of Lithuanian University of Health Sciences (KC). The respondents were questioned before leaving the hospital. Mothers were divided into two groups according to their education level: those with higher education (university or non-university education), and without higher education (unfinished secondary, secondary, vocational education). Also, women were divided into two groups according to the place of delivery: those, who delivered in KC and those, who delivered elsewhere. There were 136 women, who delivered elsewhere; therefore, in order to improve reliability of the research study, 24 respondents from the group of KC were selected randomly. Newborns were divided into three groups according to their birth weight: < 2,000 g, 2,000-2,499 g, ≥ 2,500 g. Then the newborns were divided into two groups according to their gestational age: < 32 weeks, ≥ 32 weeks. Descriptive and comparative statistical analysis of the data was performed by means of the statistical package SPSS® Statistics 17.0, including the test  $\chi^2$  and crosstabs. The result was considered statistically significant when  $p < 0.05$ .

## RESULTS

The questionnaire was completed and returned back by 136 respondents. The average age of the respondents was 29.1 years ( $\pm 5.37$ ). 95.6% of the respondents lived together with the newborn's

father (38.1% of them were practicing exclusive breastfeeding upon hospital discharge), 2.2% of them lived alone and 0.7% with another adult. 58.2% of the surveyed respondents had higher education. 51.5% of the respondents gave birth to their first child, 30.1% to the second, 18.4% to the third and more. 10.3% of the surveyed respondents were smoking during pregnancy (11.1% of smoking and 40.0% of non-smoking were exclusively breastfeeding). 31.1% were using alcohol (35.9% of them and 39.3% of non-drinking respondents were exclusively breastfeeding). At the time of hospital discharge, one third of the respondents were exclusively breastfeeding (37.9%), 31.5% combined breastfeeding with bottle feeding, and 30.6% were exclusively bottle feeding. The feeding method upon hospital discharge did not depend on the mother's age, occupancy, alcohol addiction and smoking, however depended on the education level. Mothers without higher education were significantly more often bottle feeding ( $p = 0.028$ ). 40.5% of women with higher education were exclusively breastfeeding, whereas of those without higher education – 33.3%. The average duration of pregnancy was 33.3 weeks ( $\pm 3.2$ ). Infants born with a gestational age > 32 weeks were significantly more often ( $p = 0.001$ ) exclusively breastfed (45.7%) than those born with a lower gestational age (32.4%). Newborns with birth weight > 2,500 g were more often exclusively breastfed (58.5%) than those with birth weight comprised between 2,000-2,500 g (39.4%) or < 2,000 g (20%). 42% of newborn babies were females, 58% males. 31.6% of newborns were born by Caesarean section (28.2% of them were exclusively breastfed upon hospital discharge), and 68.4% were born vaginally (42.4% of them were exclusively breastfed). Infant's gender and mode of delivery had no influence on the selection of feeding method. Breastfeeding rates depended on the number of pregnancies and deliveries. Mothers with more than one previous birth were significantly more often exclusively breastfeeding ( $p = 0.04$ ). 23.1% of the first-time mothers reported exclusive breastfeeding, whereas percentage of the exclusive breastfeeding among mothers of second baby was 52.6%, and among mothers of later babies 57.1%. Mothers, whose newborn babies were transferred from other inpatient units, were significantly more often bottle-feeding them ( $p = 0.027$ ). Mothers, who delivered not at Kaunas Clinics, were 2.5 times more often bottle-feeding upon hospital discharge (87.5%

vs. 33.3%). 54.8% of the respondents indicated in the questionnaire that had faced complications after delivery. The method of baby feeding upon hospital discharge depended on delivery-related complications. Mothers having not faced delivery-related and postpartum complications, through which they would have been separated from their infants, were significantly more often ( $p = 0.007$ ) exclusively breastfeeding (48.2%) than those having suffered certain complications (29.9%). Mothers having suffered delivery-related and postpartum complications were more often exclusively bottle-feeding upon discharge (41.8%), than those without complications (16.1%). The newborn babies, who were exclusively breastfed upon hospital discharge, were roomed in with their mothers from the day 5 on average ( $\pm 4.3$ ). On the contrary, the newborn babies, who were breastfed with additional formula feeding at the time of hospital discharge – from the day 12.9 ( $\pm 16.2$ ), and those, who were exclusively bottle-fed – from the day 17.5 ( $\pm 20.9$ ). Mothers, who were in separate rooms with their newborn babies, were significantly more often ( $p = 0.014$ ) exclusively bottle-feeding upon discharge (50%), than those, who were roomed-in with their newborn babies from the first day (4.2%).

#### CONCLUSIONS

1. Number of deliveries, delivery-related and postpartum complications, as well as the place of delivery were likely to influence the method of feeding upon hospital discharge, however the mode of delivery had no influence.
2. The mother's age, occupation and addictions had no influence on the method of feeding upon hospital discharge, however the education level had.

#### ABS 9

#### RISK FACTORS REGARDING SUCCESSFUL EXCLUSIVE BREASTFEEDING

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#### INTRODUCTION

Despite all the studies that support the benefits of breastfeeding, the percentage of Spanish new-

borns that are breastfed at discharge from hospital varies between 50-65%. Socio-demographic issues, cultural background and problems during delivery can affect the success of breastfeeding.

#### AIMS

Our goal was to determine the prevalence of exclusive breastfeeding (EBF) at discharge and the factors related to it.

#### METHODS

Cross-sectional study, involving mothers and their newborns, at discharge from the maternity ward of a tertiary hospital, between October 2105 and February 2016. Exclusion criteria: admission to Neonatology ward. Mothers filled out an anonymous survey before discharge. Collected variables: socio demographic data, gestational history, type of delivery, childbirth preparation, breast-feeding desire and infant feeding at discharge. We analyzed which factors could reduce the incidence of EBF at discharge in the group of mothers with breastfeeding desire. Bivariate and multivariate analysis of the data was performed.

#### RESULTS

225 surveys were included (**Tab. 1**); 156 (69.3%) newborns were discharged with EBF, 41 (18.2%) with partial breastfeeding (PBF) and 25 (11.1%) with infant formula feeding. The median (IQR) of gestational age was 40 (39.5-40.5) weeks, birth weight 3,210 g (2,960-3,470) and maternal age 34.5 (31.5-37.5) years. **Tab. 1** shows the characteristics of the population. The bivariate analysis shows that previous breastfeeding experience (OR 0.22, 95% CI 0.08-1.60) and skin-to-skin contact immediately after birth (OR 0.44, 95% CI 0.20-0.98) are factors that improve EBF at discharge, while C-section (CS) delivery (OR 3.77, 95% CI 1.74-8.16) is a risk factor. The model of multivariate logistic regression adjusted for variables with  $p < 0.10$  in the bivariate analysis showed that increased maternal age at delivery (OR 1.09, 95% CI 1.02-1.19), CS delivery (OR 2.67, 95% CI 1.14-6.24) and previous breastfeeding experience (OR 0.20, 95% CI 0.07-0.57) are independent factors associated with the type of feeding at discharge in the group of mothers with breastfeeding desire.

#### CONCLUSIONS

Increased maternal age and CS birth are risk factors to obtain EBF, conducting to higher rates of partial breastfeeding, while having breastfed a previous child favors exclusively breastfed newborns.

**Table 1 (ABS 9).** Characteristics of the population (regarding 225 surveys).

Variables	n (%)	95% CI / IQR
<b>Sex</b>		
Female	112 (49.8%)	43.0-56.5
Male	105 (46.7%)	46.7-53.4
<b>Birth weight (grams), median</b>	3,210	IQR 2,960-3,470
<b>Gestational weeks, median</b>	40	IQR 39.5-40.5
<b>Mother's age (years), median</b>	34.5	IQR 31.5-37.5
<b>Nationality</b>		
Spanish	188 (83.6%)	78.5-88.6
European	9 (4%)	1.2-6.8
Arabian	4 (1.8%)	0.5-4.5
South American	8 (3.6%)	0.9-6.2
Chinese	2 (0.9%)	0.1-3.2
Others	1 (0.4%)	0.01-2.4
Unanswered	13 (5.8%)	2.5-9.1
<b>Childbirth preparation</b>	157 (69.8%)	63.6-76.0
<b>Breastfeeding desire</b>	196 (87.1%)	82.5-91.7
<b>Cigarettes during gestation</b>	31 (13.8%)	9.0-18.5
<b>Previous breastfeeding experience</b>	70 (31.1%)	24.8-37.4
<b>Past breastfeeding length, median</b>	7	IQR 3.75-12
<b>Delivery</b>		
Natural delivery	124 (55.1%)	48.4-61.8
Non eutocic delivery	43 (19.1%)	13.8-24.5
CS	24 (10.7%)	6.4-14.9
Emergency CS	26 (11.6%)	7.2-16.0
<b>Skin-to-skin contact</b>	176 (78.2%)	72.6-83.8
<b>Skin-to-skin contact (minutes), median</b>	50	IQR 15-60
<b>Feeding at discharge</b>		
EBF	156 (69.3%)	63.0-75.6
Partial breastfeeding	41 (18.2%)	18.2-23.5
Infant formula feeding	25 (11.1%)	6.8-15.4
Unanswered	3 (1.3%)	0.3-3.8

CS: C-section; EBF: exclusive breastfeeding.

## ABS 10

### THE INFLUENCE OF MOTHER'S ATTITUDE AND MEDICAL STAFF'S ACTIONS ON THE RATES OF BREASTFEEDING OF PRETERM INFANTS

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## INTRODUCTION

Despite the benefits of breastfeeding, preterm infants are breastfed more seldom and shorter than the infants born at term. It is important for the medical staff to have enough skills and knowledge to promote breastfeeding and provide information to mothers. Support and advice from nurses, skin-to-skin contact promotion, and early initiation of breastfeeding are among the actions of the medical personnel that could affect the rates of breastfeeding of preterm infants.

## METHODS

Anonymous survey of women, who gave birth to premature infants during the period of February, 2015-November, 2015, was conducted at the Hospital of Lithuanian University of Health Sciences Kauno Klinikos. Respondents were interviewed right before their discharge from the hospital. 136 participants answered the questionnaire. Descriptive and comparative statistical data analysis was performed with SPSS® 17.0, using Pearson's Chi-Square test and crosstabs. Values were considered statistically significant with  $p < 0.05$ .

## RESULTS

The mean age of the participants was 29.16 ( $\pm 5.37$ ) years. For 46.2% of women the newborn was their first-born, for 53.8% the newborn was the second child, or even third or more. The average time that the mothers had planned to breastfeed was 11.25 ( $\pm 5.16$ ) months. 94.1% of women were intending to breastfeed their infant after the pregnancy, but after the preterm delivery, there were only 69.3% of women left, who were still intended to breastfeed. Mothers, who did not plan to breastfeed, at the time of discharge from the hospital more often fed their babies only from the bottle (80%), if compared to those, who had planned to breastfeed (28%) ( $p = 0.038$ ). Mothers who believed that after the preterm birth they will be able to breastfeed as long as it had been planned, at the time of discharge from the hospital breastfed more often (50.6%) than those who had doubts (16.7%) ( $p = 0.001$ ). Women, who had had the breastfeeding experience, at the time of discharge from the hospital, more often fed their babies exclusively from the breast (53.6%), compared with those, who had not had such experience (25.4%) ( $p = 0.005$ ). 79.3% of women after giving birth pumped their milk. Mothers who at the time of discharge from the hospital fed exclusively from the breast, significantly more often did not pump their milk, while those, who at

the time of discharge from the hospital fed from the bottle as well as from the breast, significantly more often pumped their milk ( $p = 0.001$ ). 72.7% of mothers heard of the kangaroo method. 71.1% of women heard about it from the hospital staff, 20.6% of women read about it in press, 8.2% heard about it from the relatives. Most women stated that the kangaroo method is important for the mother and for the infant (96.9%). Women, who had the skin-to-skin contact with their newborn immediately after birth, at the time of discharge from the hospital significantly more often fed their babies exclusively from the breast, if compared to those who had the skin-to-skin contact later ( $p = 0.001$ ). 66.7% of mothers who experienced the skin-to-skin contact within the first 6 hours after the infant's birth, at the time of discharge from the hospital, fed these infants exclusively from the breast, whereas among those who had the skin-to-skin contact during 6-24 h, 38.5%, those within 1-2 days 46.7%, and after 2 days 22.6%, respectively. On average, a newborn was placed on the breast to initiate breastfeeding on 9.84 ( $\pm 15.67$ ) days. 34.2% of newborns were placed on the breast during their first day, 35.8% were placed on the breast during the first 7 days, 30% were placed on the breast after more than 7 days. Women, whose infants were placed on the breast on the first day, at the time of discharge from the hospital were exclusively breastfeeding significantly more often (44.4%); whereas those, whose infants were placed on the breast after 7 days, significantly more often fed only from the bottle (53.1%). The average infant's weight, when placed on the breast, was 2,203.6 ( $\pm 617.8$ ) g. Infants, whose weight was  $\geq 2,500$  g when they were first placed on the breast, were significantly more often exclusively breastfed (45.2%). Newborns, who received oxygen therapy by CPAP mode, accounted for 16.8% of the survey participants, and at the time of discharge from the hospital they were significantly more often fed only from the bottle (58.8%). Newborns, who during the time of their hospitalization received oxygen therapy through a mask, composed 17.9% of survey participants and were significantly more often fed only from the bottle (64.7%). 30.2% of infants were first fed from the breast, 40 (31.0%) were first fed from the bottle, 41 (31.8%) were first fed through the feeding tube, 9 (7.0%) were first fed from the cup. Newborns, who were first fed from the breast, at the time of discharge, were significantly more often exclusively breastfed (45.5%); whereas those, who were first fed from the bottle, at the time of discharge, were significantly more often fed from the bottle

(50%). Women, who did not have any problems with breastfeeding, at the time of discharge, breastfed more often (84.4%). 81.3% of women said that there was sufficient practical help from the nurses to have the time to breastfeed. 85% of women stated that they were provided with sufficient support, 89.7% stated that they got enough advice on breastfeeding from the nurses. Those, who got enough support (97.6%) and advice (95.3%) from the nurses, were exclusively breastfeeding their babies significantly more often.

#### CONCLUSIONS

Intentions to breastfeed and breastfeeding experience had a significant impact on the rates of breastfeeding of preterm infants at the time of discharge from the hospital. Support and advice from the nurses, skin-to-skin contact promotion, and early initiation of breastfeeding had a significant impact on the rates of breastfeeding of preterm infants at the time of discharge from the hospital. Newborns, who received oxygen therapy during their hospitalization, were significantly more often fed exclusively from the bottle.

#### ABS 11

#### DONOR HUMAN MILK OFFERS PROTECTION AGAINST LIPID OXIDATIVE STRESS IN PRE-TERM INFANTS < 32 WEEKS OF GESTATIONAL AGE

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#### INTRODUCTION

Breast milk is considered the optimal nutrition for preterm infants because apart from its nutritional properties it adds substantial antioxidant protection. Before the onset of Human Milk Banks, premature infants who could not obtain own mother's milk (OMM) received preterm formula (PF). Our aim was to study the effect of pasteurized donor human milk (DHM) in comparison to OMM and PF on preterm oxidative stress biomarker levels.

#### METHODS

60 preterm newborns < 32 GA were enrolled in this prospective observational cohort study carried

out at two NICUs between 2009 and 2013. Urines from preterm infants fed with OMM, DHM, PF or parenteral nutrition (PN) were collected on days 1, 3, 7, 14, 21 and 28. Oxidative stress biomarkers including guanidine base oxidation of DNA (8-hydroxy-2'-deoxyguanosine/2'-deoxyguanosine), circulating proteins (ortho-tyrosine/phenylalanine) and lipids (isoprostanes, isofurans, neuroprostanes and neurofurans) were determined employing validated UPLC-MS/MS methods. The Wilcoxon rank sum test ( $\alpha = 5\%$ ) was employed for comparison between groups.

#### RESULTS

No statistically significant differences were found between oxidative stress biomarkers of DNA and protein oxidation, as well as neuroprostanes and neurofurans in newborns fed with PF, OMM and DHM. Urinary levels of isoprostanes and isofurans were significantly lower in newborns fed with OMM, DHM and PN than in infants receiving PF. Newborns fed with OMM + PF and OMM + DHM showed a trend towards lower levels of isoprostanes ( $p < 0.05$ ) compared to infants receiving PF.

#### CONCLUSIONS

DHM, despite the pasteurization, offers similar protection against oxidative stress as OMM in preterm babies and superior to PF. Furthermore, infants who received mixed feeding (OMM + PF) showed also improved protection against oxidative stress. Hence, all newborns that were fully or partially fed with fresh or pasteurized human milk are at lower risk of having a pro-oxidant status.

#### ABS 12

### DNA AND PROTEIN OXIDATIVE STRESS IN PRETERM INFANTS LESS THAN 32 WEEKS OF GESTATIONAL AGE FED WITH DONOR HUMAN MILK VERSUS OWN MOTHER'S MILK

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#### INTRODUCTION

Human milk (HM) is regarded as the gold standard nutrition for newborn due to its beneficial impact

on health and survival. Preterm infants are endowed with an immature antioxidant system and prone to oxidative stress pathology. HM contains a vast array of antioxidant system and therefore is beneficial for their antioxidant capacity. When own mother's milk (OMM) is not available, pasteurized donor human milk (DHM) provided by human milk banks is administered to preterm infants. Our aim was to compare oxidative status in preterm fed with DHM vs. OMM. Therefore urinary oxidative stress markers in preterm infants (less than 32 weeks of gestational age), fed with OMM (in range of complete nutrition, 150 ml/kg) versus pasteurized DHM were compared.

#### METHODS

Prospective observational cohorts study, realized in a NICU. We show our preliminary results with 19 patients fed with HM and 8 patients with DHM. Urinary oxidative stress biomarkers in premature newborns, fed with OMM versus DHM were analyzed. A validated ultra performance liquid chromatography coupled to tandem mass spectrometry method was employed in order to determine the level of damage to DNA (ratio 8-hydroxy-2'-deoxyguanosine [8-OhdG]/2'-deoxyguanosine [2-dG]) and proteins (ratio ortho-tyrosine/phenylalanine [o-Tyr/Phe]). The Wilcoxon ranksum test ( $\alpha = 5\%$ ) was applied for the groups comparison.

#### RESULTS

No significant differences in levels of oxidative stress biomarkers for DNA ( $p = 0.3$ ) and protein oxidation ( $p = 0.2$ ) were found in urine samples from preterm infants fed with OMM or DHM.

#### CONCLUSIONS

No differences in the urinary stress oxidative pattern of DHM fed versus OMM fed premature infants. Despite the pasteurization, antioxidant capacity in DHM offers similar protection to DNA and protein oxidative stress in preterm infants when compared to OMM. One study limitation is the sample size due to recruitment short time and difficulties to have a population exclusively fed with OMM.

#### ABS 13

### RELATIONSHIP BETWEEN ENTERAL NUTRITION GROWTH IN THE EARLY NEONATAL PERIOD AND PHYSICAL AND PSYCHOMOTOR DEVELOPMENT OF VERY PREMATURE INFANTS (VPI) IN THE FIRST 8 CORRECTED MONTHS

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## INTRODUCTION

Several clinical studies have shown the advantage of a rapid increase of the enteral nutrition (EN) volume (> 25 ml/kg/day) in comparison with slow (< 25 ml/kg/day).

## METHODS

Evaluation of physical development was carried out by Fenton (2013) centile curves for premature babies until 50<sup>th</sup> week of post-conceptual age (PCA), and then at the age of 3 ± 0.5, 6 ± 0.5 and 8 ± 0.5 months of corrected age (mCA), using the CDC (2009) curves, taking into account the adjusted age (AA). Evaluation on psychomotor development (PMD) was performed with Griffiths R. scale at 3 ± 0.5, 6 ± 0.5 and 8 ± 0.5 mCA.

## RESULTS

PCA, length and Body Weight (BW) didn't differ among children of groups at hospital discharge. The rate of physical development from birth, such as the rate of BW from birth at 3 ± 0.5, 6 ± 0.5 and 8 ±

0.5-mCA, BW from the discharge at 3 ± 0.5, 6 ± 0.5, and the length of the body from birth at 8 ± 0.5-mCA in the 1<sup>st</sup> group were significantly higher than in the 2<sup>nd</sup> group (**Tab. 1**). PMD didn't differ significantly between the groups at the ages of 3 and 6 months, whereas at 8-mCA children of the 1<sup>st</sup> group had PMD corresponding to the passport age significantly more often (67% and 38.5%, respectively); 25 ml/kg/day in the neonatal period in VPI born with VLBW contributed to a more rapid dynamics of BW and length after discharge during the first 8-mCA.

## CONCLUSIONS

Rapid growth of EN in the neonatal period improved PMD at 8-mCA.

## ABS 14

### THE VERY EARLY DIFFERENCES IN THE BODY COMPOSITION BETWEEN PRETERM NEWBORNS FED WITH FORMULA OR BREAST MILK COMPARED TO THE GROUP OF FULL TERM NEWBORNS

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**Table 1 (ABS 13).** Body weight and length from birth and from discharge in the first 8 corrected months in very premature infants.

Indicator	Group 1 (n = 16)	Group 2 (n = 16)	p
Volume of enteral nutrition	> 25 ml/kg/day	< 25 ml/kg/day	
Corrected age, months	3.0 ± 0.5		
Weight increasing from birth, g/day	33.4 (± 5.35)	27.7 (± 3.91)	<b>0.005</b>
Weight increasing from discharge, g/day	36.38 (± 4.9)	30.3 (± 4.93)	<b>0.014</b>
Body length increasing from birth, cm/day	0.138 (± 0.019)	0.137 (± 0.017)	0.99
Body length increasing from discharge, cm/day	0.136 (± 0.017)	0.133 (± 0.027)	0.76
Corrected age, months	6.0 ± 0.5		
Weight increasing from birth, g/day	27.77 (± 3.2)	24.08 (± 3.3)	<b>0.006</b>
Weight increasing from discharge, g/day	28.48 (± 4.9)	24.73 (± 3.6)	<b>0.039</b>
Body length increasing from birth, cm/day	0.117 (± 0.01)	0.120 (± 0.02)	0.96
Body length increasing from discharge, cm/day	0.108 (± 0.01)	0.217 (± 0.33)	0.59
Corrected age, months	8.0 ± 0.5		
Weight increasing from birth, g/day	23.43 (± 2.4)	19.75 (± 2.2)	<b>0.05</b>
Weight increasing from discharge, g/day	23.64 (± 3.3)	19.36 (± 2.1)	0.21
Body length increasing from birth, cm/day	0.103 (± 0.08)	0.096 (± 0.012)	<b>0.04</b>
Body length increasing from discharge, cm/day	0.092 (± 0.08)	0.09 (± 0.012)	0.20

Values are means ± SDs.

## INTRODUCTION

The aim of our study is to analyze the body composition of the preterm neonates fed with either breast milk or formula compared to the matched group of full term newborns.

## METHODS

A total of 53 newborns was enrolled in the study: 34 very low birth weight (VLBW) preterm infants subdivided in the two groups: 23 formula fed infants (group A) and 11 breast milk fed infants (group B); and a control group of 19 term infants with birth weight 2,500-4,000 g (group C). The infants underwent bioimpedance analysis to determine their body composition either at the age of corrected term of birth in the VLBW group or during the 1<sup>st</sup> week of life when they were born full term. The study protocol was approved by the Ethical Committee (No. KBET/58/B/2013) of the Jagiellonian University Medical College. The study is sponsored by a grant number RG1/2013 obtained from NUTRICIA Foundation.

## RESULTS

We noted comparable body weights in both study and control groups; however fat free mass (FFM) was significantly lower (83.8% vs. 85.5% vs.  $p < 0.01$ ), while the fat mass (FM) was statistically higher (16.2% vs. 14.5%  $p < 0.01$ ) in the group of the VLBW preterm infants compared to full term newborns. We found no differences in FFM (85.5% vs. 84.3%;  $p = 0.13$ ) or FM (14.5% vs. 15.7%;  $p = 0.13$ ) between the control group and preterm infants fed with breast milk, whereas formula fed VLBW babies demonstrated significantly higher amount of adipose tissue (16.5% vs. 14.5%;  $p < 0.01$ ) and lower amount of FFM (83.6 vs. 85.5;  $p < 0.01$ ) compared to the control group.

## CONCLUSIONS

The VLBW preterm infants fed with breast milk shared similar body composition with the full term infants, while the formula fed VLBW preterm infants developed significantly higher amount of adipose tissue and lower amount of FFM. Interestingly, such differences were noted very early at the age of corrected time of birth despite the comparable weights.

## ABS 15

### ANALYSIS OF THE INFLUENCE OF DIFFERENT TYPES OF DELIVERY AT THE TIME OF FIRST BREASTFEEDING IN HEALTHY TERM NEWBORNS

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## INTRODUCTION

Exclusively breastfeeding is the best form to feed a baby during the first 6 months of life. An early start to breastfeeding increases its success. Several factors influence the time of initiating breastfeeding.

## AIMS

To understand the influence of different types of childbirth on the time of the first breastfeeding (TFB).

## METHODS

An analytic observational prospective study was performed on births that occurred in the Braga Hospital, with 120 primiparous mother-child couples, during 8 consecutive weeks. Differences in TFB and in the time of mother-child interaction were researched in instrumented and non-instrumented vaginal births and caesarean sections using a Mann-Whitney test. The initial time of mother-child separation was analyzed. Hierarchical multiple regression (HMR) was used to understand in what measure the type of delivery predicted the final outcome, while controlling the influence of confounders.

## RESULTS

Newborns (NBs) spontaneously delivered started breastfeeding earlier (Mdn = 45) than those delivered by caesarean section (Mdn = 73) ( $U = 322$ ,  $p < 0.001$ ), as did those of eutocic birth (Mdn = 38), when compared to those of assisted vaginal birth (Mdn = 59) ( $U = 265$ ,  $p < 0.001$ ). From the correlation between interval of initial mother-child separation and TFB,  $r_s(120) = 0.588$ ,  $p < 0.001$  was obtained. It was found that 25% of NBs born by caesarean section were given formula milk. The final HMR model predicted 61.6% of TFB variance,  $F(6, 112) = 29.9$ ,  $p < 0.001$ , dystocic births being responsible for 48.3% of this,  $F(2, 116) = 54.2$ ,  $p < 0.001$ . Caesarean section is the variable with the greatest importance for TFB, causing its delay (Beta = 0.615,  $p < 0.001$ ), while skin-to-skin contact anticipates it (Beta = -.205,  $p = 0.011$ ).

## CONCLUSIONS

Since dystocic births were the main factor responsible for delay in the TFB, greater support should be given to mother-child with this type of birth and early skin-to-skin contact should be promoted.

## ABS 16

## HUMAN MILK BANK ESTABLISHMENT IN A NEONATAL UNIT IMPROVES BREASTFEEDING RATES

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### INTRODUCTION

Human milk, particularly own's mother milk (OMM), provides premature infants with multiple short and long term benefits. When OMM is not available, pasteurized donor human milk (DHM) provided by human milk banks constitutes the best alternative for very low birth weight infants (VLBW). The availability of donor milk from a human milk bank in a neonatal unit might interfere with mother's attitude to breastfeeding and breast milk expression. The Human Milk Bank (HMB) opened at the Neonatal Division at Hospital Universitario y Politécnico La Fe in March 2010. Our hypothesis is that the establishment of a

HMB would increase breastfeeding rates at discharge.

### METHODS

A cohort study comparing two periods, before and after the establishment of the HMB: from 1 January 2005 to 31 December 2009 and from 1 January 2011 to 31 December 2015, allowing a washout period between them. The Chi Square test and Student T Test (alpha = 5%) were performed for comparison between groups.

### RESULTS

Demographic characteristics of the two periods populations are shown in **Tab. 1**. Breastfeeding rates at discharge (breastfeeding, exclusive breastfeeding, partial breastfeeding and formula) in all newborn admitted, and in subgroups with birth weight < 1,500 and < 1,000 grams are shown in **Fig. 1**.

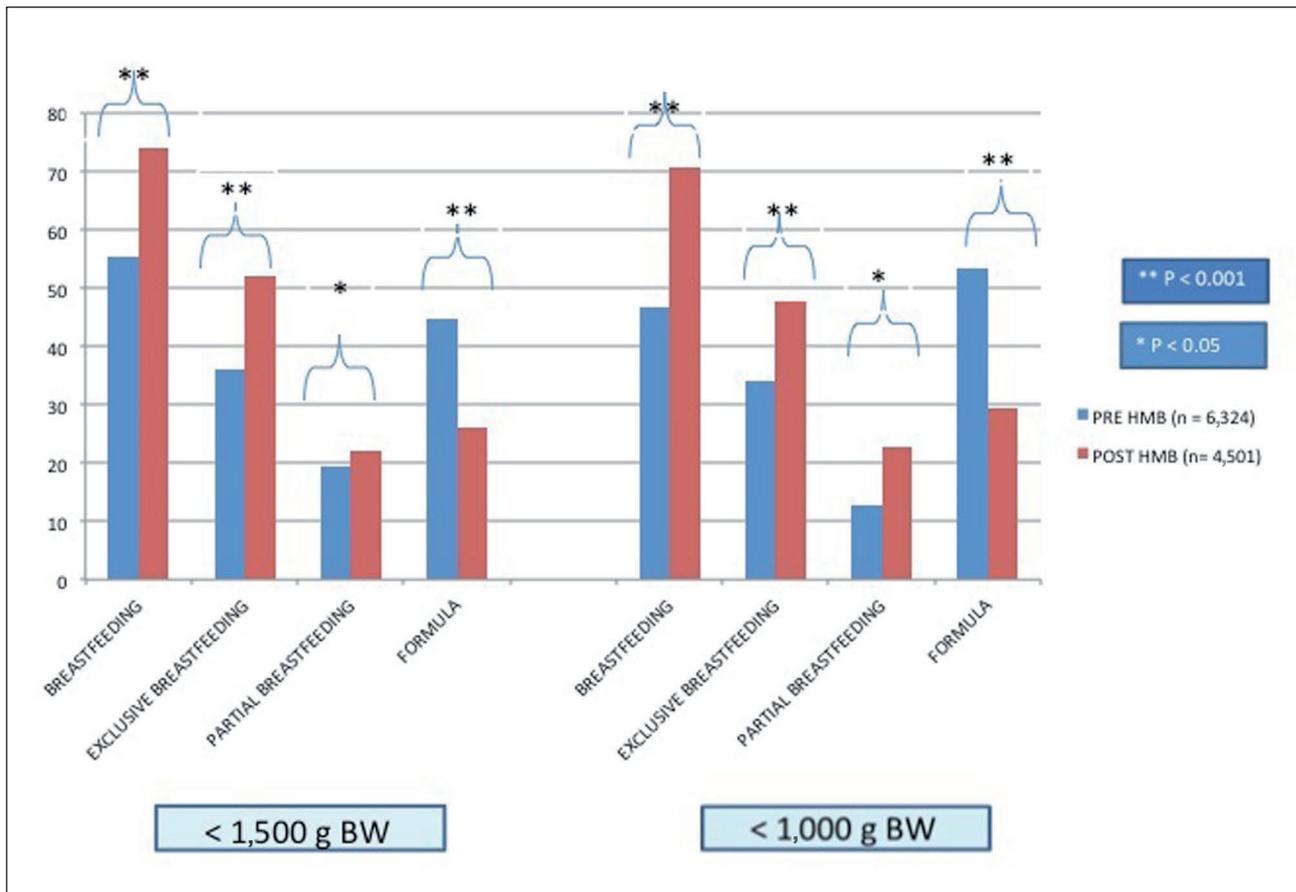
### CONCLUSIONS

The human milk bank establishment in our Neonatal Division has globally improved breastfeeding rates at discharge. The positive impact is stronger in subgroups which constitute the main DHM receptors, those with < 1,500 and < 1,000 grams birth weight, with statistically significant higher rates of any breastfeeding, exclusive and partial breastfeeding and lower use of formula.

**Table 1 (ABS 16).** Demographic characteristics of the populations in the different periods.

	Pre-HMB period		Post-HMB period		p-values
	n = 7,602	%	n = 5,230	%	
<b>Birth weight</b>					
Range	400-5,000		400-5,000		
Mean (± SD)	2,656 (± 875)		2,622 (± 878)		> 0.05
<b>Gestational age</b>					
Range	22-43		23-44		
Mean (± SD)	36.2 (± 3.9)		36.1 (± 3.9)		> 0.05
<b>Mother's age</b>					
Range	13-50		14-50		
Mean (± SD)	30.8 (± 6.2)		32.5 (± 14.1)		> 0.05
<b>Admission days</b>					
Range	1-509		1-223		
Mean (± SD)	17.0 (± 65.2)		17.4 (± 29.6)		> 0.05
<b>Multiple pregnancies</b>	780	10.2	747	14.3	< 0.001
<b>Birth weight &lt; 10<sup>th</sup> percentile</b>	797	11	609	12	< 0.001
<b>Cesarean section</b>	502	6.6	436	8.3	< 0.001
<b>Exitus</b>	230	3	146	3	> 0.05

HMB: Human Milk Bank.



**Figure 1 (ABS 16).** Comparison of breastfeeding rates at discharge in VLBW infants before and after the establishment of a Human Milk Bank (HMB), from 2011 to 2015.

## ABS 17

### LONG-TERM DIFFERENCES IN METABOLIC PATTERN BETWEEN MILK FROM MOTHERS DELIVERING TERM AND PRETERM NEWBORNS: A METABOLOME STUDY

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#### INTRODUCTION

The human milk metabolome, established by nuclear magnetic resonance (NMR) spectroscopy, is influenced by gestational and lactation age. Different levels of metabolites have been identified in colostrum from term mothers compared with mature milk. The composition of milk from mothers

that deliver prematurely differs from term mature milk and changes over time.

#### OBJECTIVE

To test the hypothesis that changes in metabolic profile of milk from mothers delivering prematurely persist over time when compared with milk of mothers delivering at term.

#### METHODS

Proton magnetic resonance spectroscopy (MRS) was used to analyze 47 human milk samples, collected from Caucasian women living in the same city, which adopted a similar healthy lifestyle before and during pregnancy. 11 term milk samples, collected once within four to seven days after birth, were compared with 13 preterm milk samples collected week by week after delivery.

#### RESULTS

First component of the PCA analysis (PC1) showed two distinct metabolic groups: human preterm milk samples, collected in the four weeks of lactation, and milk samples collected from mothers of term infants. Metabolite profiling identified that lactose and oligosaccharides levels, especially those fucosylated

(fucose, N-acetyl-neuraminic acid and N-acetyl-glucosamine acid), were significantly higher in preterm milk samples compared to full-term milk.

#### CONCLUSIONS

The metabolome of preterm milk changes in the four weeks postpartum and it does not resemble that of term milk. The knowledge that the specific metabolic profile of preterm milk reflects the nutritional requirement of preterm infants is crucial, paving the way for future studies to shed in light how nutrition of premature infants need to be personalized.

#### ABS 18

### “NETINCARE” PROJECT: NETWORKING TO IMPROVE HEALTH CARE FOR MOTHERS AND PREMATURE INFANTS IN THE BALTIC REGION AND MOLDOVA

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#### INTRODUCTION

The seed project, entitled “Networking to improve health care for mothers and premature infants in the Baltic region and Moldova (NETINCARE)” was aimed to create a network to address the health care challenges of premature birth and mother care in the Baltic region (Sweden, Estonia and Lithuania) and Republic of Moldova, raising public awareness and suggesting possible solutions for future action and ideas for an extended project in a larger network.

#### METHODS

The current situation/challenges, concerning health care of mothers and preterm infants, was shared by partner countries, to perform a state of the art comparison and to map differences in perinatal care and child health.

#### RESULTS

The workshop in Estonia covered the current situation and statistics on preterm birth and mother

care and possible further projects to meet these challenges. Also a study visit was organized to the Human Milk Bank at the Children’s Clinic, East Tallinn Central Hospital. During the workshop in Vilnius several experts presented the current situation of neonatal care in Lithuania. Overview of the Swedish experience together with current situation and challenges in neonatal care in Ukraine, Moldova and Estonia were brought to discussion. Experts from partner countries found that there is a significant difference in mortality, morbidity and early feeding strategies and further actions are necessary to stimulate local innovation, as well as international efforts to develop a supportive environment for technology transfer.

#### CONCLUSIONS

The final and successful meeting organized in the framework of the project was held in Chisinau, Republic of Moldova, on 6<sup>th</sup> of May 2016. All participants agreed on the necessity of educational intervention to Eastern European countries associated members of EU, and to continue the collaboration on future policy recommendations in neonatal care and feeding strategies for preterm newborns.

#### ABS 19

### POSTNATAL GROWTH RATE IN PRETERM INFANTS HOSPITALIZED IN NICU

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#### AIMS

The aim of this study was to interpret postnatal growth rate of preterm infants, in dependency of gestational age, condition at birth, initiation of enteral feeding, respiratory support, duration of parenteral nutrition and types of enteral feeding (mother milk with fortification or preterm formula).

#### METHODS

Postnatal growth was analyzed at 7 days of postnatal age (168 hours) in a cohort of 100 preterm infants free of major congenital anomalies hospitalized in NICU. Standard statistical methods were used.

#### RESULTS

Average time of achieving full enteral feeding in infants < 28 weeks of gestational age (GA) was 25.0 days (21.0-29.5); in infants 29-32 weeks of GA: 12.0 days (9.0-21); in infants 33-36 weeks of

GA: 11.0 days (8.0-14). At time of discharge 26.7% infants with GA < 28 weeks had body weight < 5<sup>th</sup> percentile. Birth weight of infants with Apgar score < 5 was statistically lower at 14 postnatal day ( $p < 0.05$ ) and 28 postnatal day ( $p < 0.05$ ). In infants with initiation of enteral feeding within first 3 days, body weight was statistically higher at 14 day, 28 day and at discharge comparing with infants with initiation of enteral feeding after 3 days. In infants with less tolerance of enteral feeding, body weight at 14 day was significantly lower ( $p < 0.05$ ) at 28 day ( $p < 0.05$ ) and at discharge ( $p < 0.01$ ). Duration of respiratory support was associated with postnatal growth rate at 14 day ( $p < 0.05$ ) and 28 day after birth ( $p < 0.01$ ), without significant difference at time of discharge. Infants fed with fortified mother milk had higher body weight at time of discharge ( $p < 0.01$ ) compared with those fed with infant formula.

#### CONCLUSIONS

Postnatal growth rate of preterm infants depends not only on conditions affecting growth but also on nutritional management practices. Achieving optimal postnatal growth rate is very important, since it improves long-term outcome of preterm infants.

#### ABS 20

##### HUMAN MILK BANKING IN GREECE; EXPERIENCE FROM A PUBLIC PERINATAL CENTRE: DATA FROM THE LAST DECADE

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#### INTRODUCTION

The ideal feeding policy for the LBW, and especially ELBW preterm infants according to the global scientific knowledge, is feeding with mother's own fresh milk, and donor human milk when needed, as well as early initiation of breastfeeding. Human Milk Bank, besides its role in collecting, screening, and pasteurizing donor's human milk, is the bridge between the mother and preterm infant, especially during the first days of lactation, when mother's milk cannot completely fulfil the needs of preterm infants.

#### METHODS

To assess the effect of the accreditation of the Maternity Hospital of "Elena Venizelou" as a Baby

Friendly Hospital one, to the human milk bank operation.

#### RESULTS

During the last five years (2010-2015), a dramatic increase in the volumes of mother's own fresh and donor human milk has been noticed in our Human Milk Bank. More specifically, the total volume of milk collected in the human milk bank from 2010 to 2015 was almost six times higher than that collected from 2005-2009 (5,104.4 vs. 941.16 L, respectively). Furthermore, the total volume of preterm mother's own milk from 2005-2009 was 92.39 L and from 2010-2015 was 389.75 L. It is remarkable that the volume of colostrum collected during 2010-2015 was 603.206 L, which is an eleven times increase, while during the years 2005-2009 was only 57.23 L. These differences were noted because during the years 2005-2009, we were not accepting donor's milk. The total volume of donors' milk from 2010 to 2015 was 1,662.7 L.

#### CONCLUSIONS

In conclusion, except from being certified as a baby friendly hospital since November 2011, we achieved in collecting much higher volume of donor's milk by spreading awareness of human milk banking all over Greece and by changing our feeding policy in the NICU.

#### ABS 21

##### MICROVILLUS INCLUSION DISEASE IN A NEWBORN

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#### INTRODUCTION

Microvillus inclusion disease (MID) is a life-threatening disease in the neonatal period, presenting with severe weight loss, hypernatremic dehydration and metabolic acidosis.

#### CASE REPORT

A term baby boy was delivered by cesarean section in a community hospital and was discharged on the second day of life without any problems. The parents were first-degree cousins and they had a healthy daughter. A poor suck was observed on the third day of life and upon admission to the hospital, he had severe dehydration, shock and metabolic acidosis. On admission, his blood sodium was 149 mmol/l.

He recovered with intravenous fluids and sodium bicarbonate. Cranial and abdominal ultrasonography and echocardiography were normal. When he was started on breast milk, the amount of stool and metabolic acidosis increased. He was given lactose-free and sucrose-free formula, but watery diarrhea continued. Immune deficiency panel, molecular tests for cystic fibrosis and immunoreactive trypsinogen were obtained, all of which were negative. His stools were 180-200 ml/kg/day, microscopic examination and reducing substances in stools were negative. Stool pH: 7.0, sodium 122 mmol/l, chloride 11 mmol/l and potassium 4.8 mmol/l. A secretory diarrhea was suspected and upper gastrointestinal endoscopy was performed with a duodenal biopsy. Pathological and electron microscopic examination were compatible with MID. Total parenteral nutrition, 180-230 ml/kg/day was administered through a central catheter. In the 5<sup>th</sup> month, he was still on TPN and was preparing for jejunal transplantation.

#### CONCLUSIONS

Microvillus inclusion disease is an autosomal recessive disorder, resulting from a molecular defect at the *MYO5B* gene. Severe cases may die from dehydration and acid-base disturbances. Diagnosis is possible by jejunal biopsy and jejunal transplantation is the only treatment option, although it is quite complicated.

#### ABS 22

##### NECROTIZING ENTEROCOLITIS IN THE FULL-TERM INFANT: ETIOLOGY AND OUTCOME

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#### INTRODUCTION

Necrotizing enterocolitis (NEC) is predominantly seen in premature infants; however, in rare instances it can affect full-term infants as well. We aimed to study etiology and prognosis of NEC in the full-term infant in our center.

#### METHODS

This is a retrospective study that includes 7 cases of a full-term infant with a diagnosis of NEC confirmed during hospitalization, in a period between January 2010 and December 2015.

#### RESULTS

All the NEC infants were delivered by cesarean section, and 6 patients were fed with a mixture

of breast milk and formula. Mean age of disease onset was very early (3 days). Two babies were hypotrophic. A Hirschsprung disease was diagnosed in 3 cases, a fetal infection in 2 cases. A surgical management was necessary in 5 cases. Feeding was reestablished after 21 days. We were able to establish the route of transmission in 3 cases after 4 months. Two newborns died before surgery.

#### CONCLUSIONS

NEC in the full-term population seems to differ from that of the preterm group in the timing of its onset and etiology. A principal risk factor in our study was Hirschsprung disease.

#### ABS 23

##### REDUCTION OF DONOR HUMAN MILK CONTAMINATION FOLLOWING A NEW COLLECTION PROTOCOL

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#### INTRODUCTION

Human milk banks (HMB) work under defined guidelines to ensure donor human milk quality and safety. Donors proceed to express and store milk at home using HMB sterile bottles and pump kits and following the verbal and written expression instructions. High milk bacterial counts might interfere with milk properties and indicate a sub-optimal hygienic manipulation. HMB have defined criteria to discard highly contaminated HM. In order to improve milk quality and to reduce the number of batches discarded, additional steps were introduced in the expression protocol including providing hydroalcoholic solution for hand cleaning before expression and a microwave sterilizing bag for pump pieces. The new protocol was implemented in July 2015.

#### MATERIAL AND METHODS

Microbiological cultures: under sterile conditions, 2 ml of every donor human milk batch was cultured (10 µl in chromogenic agar and 1,000 ml in thioglycolate media), both before and after Holder pasteurization (62.5°C for 30 minutes). Batches with > 10<sup>5</sup> CFU/ml were discarded. Two periods, before and after

introduction of the new protocol were compared (October 2014 to February 2015 vs October 2015 to February 2016). The Chi square test ( $\alpha = 5\%$ ) was employed for comparison between groups.

#### RESULTS

See **Tab. 1**.

#### CONCLUSIONS

- After the introduction of the new protocol, the number of discarded batches reduced al-

though the difference did not reach statistical significance.

- In post-pasteurization cultures, *Bacillus spp.* is the predominant bacteria.
- One limitation of the study is the potential inclusion of some HM donations of accumulated milk expressed under acceptable conditions which might have contributed to the small differences found in both periods.

**Table 1 (ABS 23).** Number of discarded batches in the two different periods.

	First period	%	Second period	%	p-value
No. batches pasteurized	296		250		
No. batches distributed	238		207		
No. batches discarded	58	19.6	43	17.2	> 0.05
No. batches discarded for pre-pasteurization culture	32	10.8	22	8.8	> 0.05
No. batches discarded for post-pasteurization culture	26	8.7	21	8.4	> 0.05
No. batches discarded for post-pasteurization culture - <i>Bacillus spp.</i>	24	92.3	16	76	> 0.05