Abstracts

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ABS 1

EARLY VERSUS DELAYED PHOSPHOROUS SUPPLEMENTATION IN PREMATURE NEONATES

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BACKGROUND

Phosphorus is essential for cellular energy production, bone mineralization and acid buffering. As most bone accretion takes place during the third trimester, appropriate intake of phosphorus and calcium is essential for bone mineralization in premature infants. Current parenteral provision of electrolytes is inadequate compared to *in utero*. Increasing evidence suggests that higher protein intake immediately after birth, without increasing phosphorus intake, leads to calcium resorption and osteopenia. We hypothesized that the addition of phosphorus to parenteral nutrition immediately after birth would decrease hypophosphatemia, metabolic acidosis, and osteopenia of prematurity.

METHODS

Our standard parenteral nutrition bags provided dextrose (glucose infusion rate: 4 mg/kg/min), protein (2.5 g/kg/day) and calcium (0.7 mEq/kg/day) in the first 24 hours of life. We increased the calcium (1 mEq/kg/day) and added sodium phosphate (0.5 mmol/kg/day) without changing protein or dextrose components. Infants < 29 weeks gestation who received early phosphorous (EP) were matched by gestational age and birth weight to two historical controls (delayed phosphorous – DP) born in the year preceding the practice change. We compared serum phosphorus, calcium, bicarbonate, and sodium levels. Parenteral intake of sodium, acetate, phosphorous, and calcium were evaluated. Initial (measured at 2 weeks of life) and peak alkaline phosphatase were used as surrogates for osteopenia.

RESULTS

21 patients were included in the analysis (EP: n = 7; DP: n = 14). There were no differences in baseline serum phosphorous (5.3 vs. 4.7 mg/dL; p = 0.45), calcium (8.4 vs. 8.5 mg/dL; p = 0.9), or bicarbonate levels (18.7 vs. 19.4; p = 0.7). EP sodium was lower at baseline (137 vs. 142 mmol/L; p = 0.02), but not different at any other time point. The EP group had a higher day 7 phosphorous (5.4 vs. 3.9 mg/dL; p = 0.04), and at day 3 had slightly lower calcium (9.3 vs. 10.4 mg/dL; p = 0.004) and higher bicarbonate (21 vs. 17 mmol/L; p = 0.006) compared to DP. Initial (190 vs. 395; p = 0.05) and peak alkaline phosphatase levels (357 vs. 482; p = 0.15) were not different between groups. Overall sodium intake (mEq/kg/day) was significantly lower in EP on days 2 (2.1 vs. 5.9; p = 0.04) and 3 (1.7 vs. 4.3; p = 0.01). EP acetate intake (mEq/kg/day) was lower on days 1 (0.95 vs. 7.4; p = 0.001), 2 (1.5 vs. 4.5; p = 0.003), and 3 (1 vs. 7.4; p < 0.0001). Phosphate and calcium intake in parenteral nutrition on days 1, 2, and 3 were not significantly different.

CONCLUSIONS

Early sodium phosphate intake in premature infants was associated with higher serum phosphorous but not sodium levels in the first week of life. Despite receiving significantly less acetate supplementation across all time points, serum bicarbonate levels were higher in the EP group. EP may be associated with a clinically-significant trend in lower initial alkaline phosphatase levels.

ABS 2

ASSOCIATION OF EXCLUSIVE HUMAN MILK FEEDING AND NECROTIZING ENTEROCOLITIS IN VERY LOW BIRTH WEIGHT NEONATES

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INTRODUCTION

Necrotizing enterocolitis (NEC) is a disease affecting mainly very low birth weight (VLBW) preterm babies. It is associated with multiple risk factors leading to inflammation and injury to the immature

intestines. Clinical trials have shown significant reduction in NEC in babies fed with the mother's own milk (MOM) and donor human milk (DHM) but there is no literature that correlates feeding exclusively with MOM and reduced incidence of NEC. This prospective study associates MOM-only feeding with zero incidence of NEC. Mothers after delivery are counselled and encouraged by healthcare staff to express adequate amounts of breast milk to feed their premature babies. This study also shows how exclusive MOM feeding can be implemented in an intensive care setting.

METHOD

In this prospective study, premature neonates with birth weight (BW) < 1,500 g admitted to the NICU from February 2012 to May 2018 were exclusively fed MOM until discharge. No preterm hydrolysed formula milk, human milk fortifier or DHM was used. All neonates received one dose of surfactant at birth in the labour ward and required mechanical ventilation followed by nCPAP or blended oxygen by nasal prongs until weaned off to room-air. Once stabilized in the NICU from the labour ward they were started on intravenous 10% dextrose and oral 5% dextrose by continuous nasogastric tube until MOM was available. Fluids were started at 80 ml/kg/day increasing to 160-200 ml/kg/day. Continuous nasogastric feeds were given until 10 ml/hr/day was achieved, after which they were bolus fed (3 hourly). All the babies were closely monitored in the NICU and reviewed daily by the Neonatologist. Data is presented as mean (SD) or median [IQR] where appropriate.

RESULTS

There were 65 neonates admitted during this study. The smallest neonate weighed 600 g. Mean birthweight was 1,244.6 (258) g and the mean gestational age was 29.2 (1.7) weeks. The mean time on mechanical ventilation was 12.0 [6.0-20.0] hours, nCPAP was 10.5 [5.0-25.0] hours and nasal prong (blander) oxygen was 24.0 [12.0-48.0] hours. The mean time by which full feeds of MOM were established was 4.9 (1.0) days and the mean number of days intravenous fluids were given was 5.2 (1.0) days until full feeds were established. The median duration of hospital stay was 45.0 [36.0-54.0] days. During this period no baby developed NEC.

CONCLUSIONS

To our knowledge, this is the first prospective study showing the immense protective benefits of exclusively feeding MOM and no incidence of NEC. Human milk with its bioactive components can never be replaced by DHM, preterm hydrolysed milk formulas or human milk fortifiers. The universal usage of human milk will maximally reduce NEC in VLBW preterm babies.

The baby-friendly NICU can be universally achieved by standardization of nutrition practices for the premature. The production of MOM can be achieved by lactation support given to the mothers by other mothers who already have a preterm baby in the unit and by medical staff.

ABS 3

PERIPHERAL VENOUS CATHETER (PVC) VS PERIPHERALLY INSERTED CENTRAL VENOUS CATHETER (PICC) FOR VERY LOW BIRTH WEIGHT NEWBORNS. A RANDOMISED TRIAL

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INTRODUCTION

Total parenteral nutrition (TPN) is started right after birth for very low birth weight (VLBW) newborns. TPN might be administered via a peripheral venous catheter (PVC) or a peripherally inserted central catheter (PICC). Practices in choosing a catheter vary among different hospitals. A *Cochrane* review published in 2008 and updated in 2015 found no difference in clinical data and complications when administering TPN via PVC or PICC.

METHODS

A randomized trial was conducted in the Hospital of the Lithuanian University of Health Sciences Kaunas Clinics. The trial evaluated primary outcomes of VLBW (≥ 750 g - <1,500 g) newborns fed parenterally using PVC or PICC. Patients matching eligibility criteria were randomized into two groups within 24 hours after birth: PVC group and PICC group. The results analyzed and presented here are number of catheters per patient, mean duration of catheter use, mean amounts of administered nutrients and sepsis in both groups.

RESULTS

A total of 85 newborns were included in the trial: 37 in the PVC group and 48 in the PICC group. The main characteristics of patients were not significantly different (**Tab. 1**). There were more

catheter changes in the PVC group, the duration of one catheter use was longer in the PICC group and the difference was statistically significant (**Tab. 2**). The rate of total sepsis, sepsis during TPN administration, and age at which sepsis was diagnosed were not statistically significant (**Tab. 3**).

Table 1 (ABS 3). Main characteristics of study patients.

	PVC group (n = 37)	PICC group (n = 48)	p
Gestational age (weeks)			
mean (SD)	28.7 ± 1.74	28.4 ± 2.1	0.936
median	28.5	28.0	
Birth weight (g)			
mean (SD)	1,156.2 ± 193.48	1,101.3 ± 213.70	0.265
median	1,196.0	1,086.0	
Gender			
boys, n (%)	18 (47.4)	27 (57.4)	0.355
girls, n (%)	20 (52.6)	20 (42.6)	
SGA, n (%)	4 (10.5)	10 (21.3)	0.355

PVC: peripheral venous catheter; PICC: a peripherally inserted central catheter.

Table 2 (ABS 3). Catheters used for administering total parenteral nutrition (TPN).

	PVC group (n = 37)	PICC group (n = 48)	p
Number of catheters used (n)			
mean (SD)	3.3 ± 1.51	1.1 ± 0.31	**< 0.001**
median	3.0	1.0	
Duration of one catheter use (d)			
mean (SD)	2.7 ± 1.13	7.8 ± 2.48	**< 0.001**
median	2.58	8.0	

PVC: peripheral venous catheter; PICC: a peripherally inserted central catheter.

Table 3 (ABS 3). Sepsis in peripheral venous catheter (PVC) and peripherally inserted central catheter (PICC) groups.

	PVC group (n = 37)	PICC group (n = 48)	p
Sepsis, n (%)	7 (20)	8 (17.8)	0.801
Age at sepsis episode (d)			
mean (SD)	13.9 ± 11.36	16.3 ± 18.21	0.816
median	10	8	
Sepsis episode during TPN administration, n (%)	3 (42.9)	6 (75)	0.315

PVC: peripheral venous catheter; PICC: a peripherally inserted central catheter.

CONCLUSIONS

There were significantly fewer catheters used for TPN administration and longer duration of one catheter use in the PICC group. Rate of sepsis was not different in both groups.

ABS 4

MACRONUTRIENT COMPOSITION OF HUMAN MILK DEPENDING ON DIFFERENT GESTATIONAL AGE AT BIRTH

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INTRODUCTION

Over the last few decades, the nutritional composition of human milk (HM) has been extensively analyzed, but only a few studies describe the breast milk macro-nutrient content of mothers who have delivered extremely premature infants. The aim of our study was to evaluate breast milk macro-nutrient and energy content depending on the degree of prematurity.

METHODS

24-hour HM samples were collected from 49 mothers between 14-16 lactation days, using manual or electric breast pump and completely emptying one or both breasts. Mothers were divided into three groups according to baby's gestational age (GA) at birth: 1) extremely premature newborns (EPN), GA < 28 weeks (n = 13), 2) very premature newborns (VPN), GA 28-31 weeks (n = 15) and 3) term newborns, GA ≥ 37 weeks (n = 21). Mothers were asked to express their milk 6-8 times per 24-hour period and 1 ml of HM was collected after each expression, placed in a plastic container and kept in the refrigerator at 4°C. As soon as 24 hours HM samples were collected, they were mixed and analyzed for macro-nutrient composition, i.e. true protein (excluding non-protein nitrogen), fat, carbohydrate and energy content. Mid-infrared spectrophotometry analysis using Miris Human milk analyzer was used for determination of HM composition. Statistical analysis was performed using R program version 3.4.4. Data
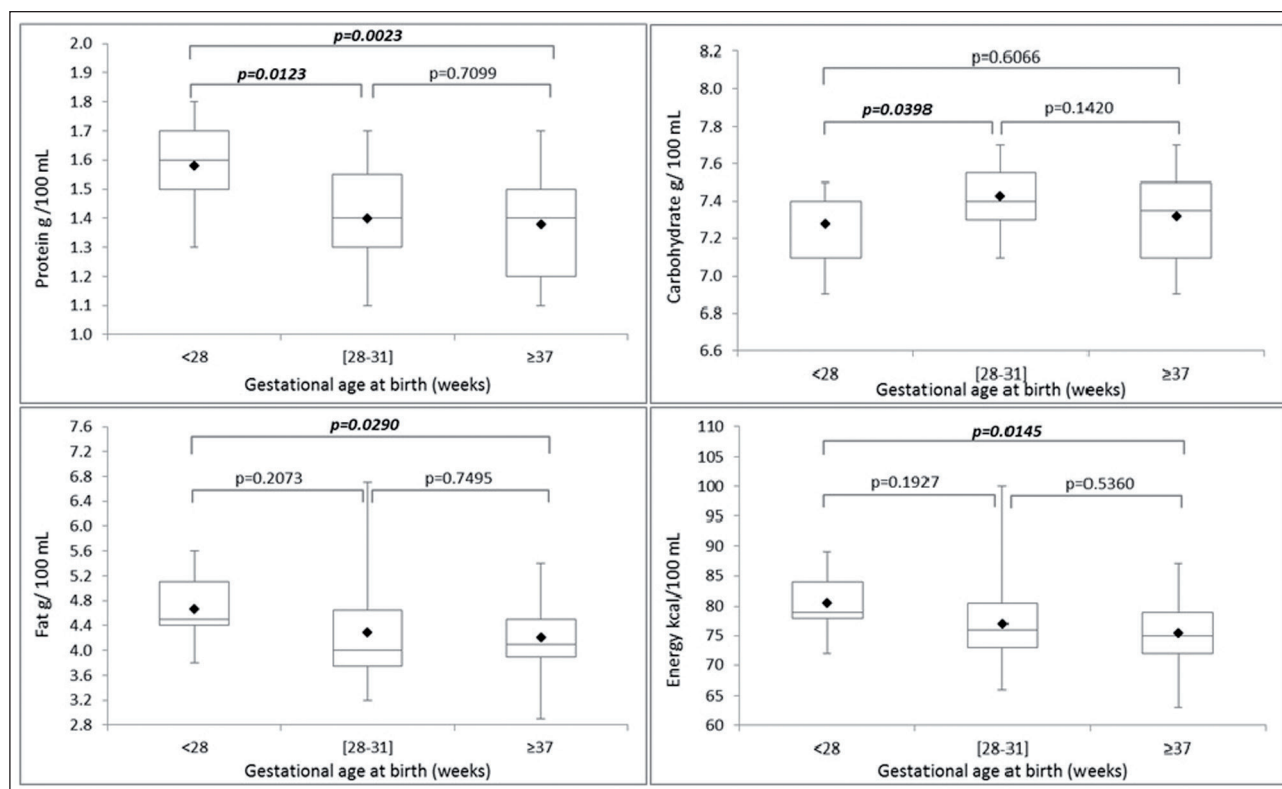
Figure 1 (ABS 4). Macro-nutrient and energy content in human milk depending on gestational stage at birth.

was summarized as mean ± SD. Shapiro-Wilk test was used to evaluate the normality of the data. Independent samples t-tests were used to compare groups. We considered differences to be significant at $p < 0.05$.

RESULTS

Mean concentration of protein (1.58 ± 0.15 g/100 mL), fat (4.67 ± 0.56 g/100 mL) and energy content (80.62 ± 5.24 kcal/100 mL) in the milk samples of the mothers of the extremely premature group was significantly higher than in the term newborns group (1.38 ± 0.18 g/100 mL, 4.21 ± 0.57 and 75.48 ± 5.85 kcal/100 mL, respectively). Mean concentration of carbohydrates was significantly lower in the extremely premature group (7.28 ± 0.20 g/100 mL) than in the very premature group (7.43 ± 0.18 g/100 mL). Our results are summarized in **Fig. 1**.

CONCLUSIONS

Analysis of HM of the mothers who delivered babies at different GAs showed significant differences in macro-nutrient composition. Those mothers who had delivered extremely and very premature newborns had significantly higher content of protein, fat and energy in their milk, compared with those who had delivered at term. Moreover, carbohydrate content in HM of mothers in the EPN group was statistically significantly lower than in the VPN group. Similar

differences between preterm and term milk have been previously described by other investigators. Lower lactose, i.e. carbohydrate level in preterm milk reduces the osmolality of HM resulting in better digestibility. We speculate that compositional differences between preterm and term milk reflect nature's way of adapting the milk components to suit individual infant needs.

ABS 5

NUTRITION AND NEURODEVELOPMENTAL OUTCOME AT 2 YEARS OF AGE: INVESTING IN THE FIRST 1,000 DAYS

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INTRODUCTION

Preterm infants are at high risk for long-term neurocognitive delay. Lower birth weight and gestational age directly correlate with decrease in developmental scores. However different developmental assessment tools have been used and data on the correlation of nutritional status (weight, head circumference and length) with neurodevelopmental outcomes at 2 years is limited.

AIM

To correlate nutritional status at birth and 2 years with neurodevelopmental outcomes.

METHODS

Retrospective data of high-risk infants (gestational age < 32 weeks and/or < 1.5 kg) were collated from a busy district general hospital over 2 years. Demographic and clinical data were collated at birth and at 2 years corrected gestation. Neurodevelopmental outcome assessment at 2 years was performed using the Bayley Scales of Infant and Toddler Development (BSID-III). Data was analysed using STATA.

RESULTS

99 preterm infants were enrolled (**Tab. 1**). The cognitive composite score on BSID-III significantly correlated with birth head circumference and gender but not with birth weight or 2 years anthropometric measures. Language and motor composite scores did not show any significant correlation with birth or 2 years anthropometrics (**Tab. 2**).

CONCLUSIONS

Birth head circumference correlated with cognitive outcomes at 2 years of age. This is likely to be related to maternal nutritional status. Gender may influence cognitive outcome, possibly in relation to sex hormones. Our data did not show any correlation with birthweight or 2-year nutritional parameters as seen in earlier studies. Further correlation is needed looking at ethnicity and maternal nutritional status along with feeding management of these preterms.

ABS 6

CAN WE PREDICT AND PREVENT OSTEOPENIA OF PREMATURITY?

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INTRODUCTION

Very low birth weight (VLBW) infants are at risk of osteopenia of prematurity (OOP) and related skeletal fractures. Improved nutritional management in recent years should reduce the incidence of OOP. However, increased use of medications, such as postnatal steroids, may have a negative effect on bone health. It can be difficult to detect early signs of OOP and often the process is quite advanced by the time X-ray changes are evident. Our aim was to examine which biochemical markers best predicted radiologically significant OOP and thus better target our treatment and follow up.

METHODS

Retrospective review of all X-rays carried out on VLBW infants over a 5-year period in a tertiary neonatal centre. We compared the biochemical markers of OOP in those with and without radiological signs of OOP. We defined OOP radiologically as infants with Stage 1 and above X-ray changes as per Koo et. al.

RESULTS

Of the 609 VLBW infants included in the study, 5.9% of babies showed radiological evidence of OOP. Average gestation of babies born with OOP was 26^{+3} weeks and it took, on average, 6.5 weeks for radiological evidence of OOP to be seen. When comparing babies with and without radiological

Table 1 (ABS 5). Demographic and Infant Data of Study Cohort.

Demographics/infant data	n = 99
Mean gestation at birth (weeks/SD)	29 weeks (2.1)
Gender (M:F)	56:43
Mean birth weight (g/SD)	1,186 (334)
Mean head circumference (cm/SD)	26.5 (2.5)
IUGR (%)	21
Corrected age at ND assessment (mo/SD)	24.6 (3.3)
Mean Cognitive composite score (SD)	89.6 (14.5)
Mean Language composite score (SD)	87.4 (22.6)
Mean Motor composite score (SD)	84.8 (13.5)

Table 2 (ABS 5). Neurodevelopmental scores and anthropometric measurements.

BSID composite scores	Cognitive p-value (95% CI)	Language p-value (95% CI)	Motor p-value (95% CI)
Birth weight	0.35 (-.05, .12)	0.28 (-.07, .24)	0.86 (-0.07, 0.08)
Gestation	0.28 (-9.3, 30.9)	0.98 (-38.4, 37.5)	0.3 (-29.1, 9.3)
Gender	0.019 (2.7, 27.7) [a]	0.05 (-0.18, 46.9)	0.17 (-3.8, 20.1)
Birth head circumference	0.026 (-24.6, -1.8) [a]	0.20 (-36.2, 8.1)	0.91 (-10.3, 11.6)
Weight at 2 y	0.39 (-2.6, 6.6)	0.61 (-6.5, 10.8)	0.64 (-5.4, 3.4)
Head circumference at 2 y	0.75 (-8.0, 5.8)	0.89 (-13.0, 11.4)	0.89 (-5.8, 6.6)

[a] p < 0.05.

evidence of OOP, particular biochemical parameters were found to be significant. Statistically significant differences were seen in highest alkaline phosphatase, duration of raised alkaline phosphatase and duration of low phosphate.

CONCLUSIONS

The time duration with elevated alkaline phosphatase and length of time with low phosphate were strong predictors of OOP. Using this information, it can be concluded that promptly correcting high alkaline phosphatase and low phosphate should have an impact on reducing OOP in these babies.

ABS 7

CHARACTERISTICS OF NEWBORNS FED EXCLUSIVELY WITH THEIR MOTHERS' OWN MILK: AN OBSERVATIONAL STUDY IN THE NICU

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INTRODUCTION

There is a consensus as to the importance of the use of human milk in the enteral feeding of neonates. While an infant's own mother's fresh milk (MOM) is preferred, the consensus includes supplementation, as needed, with donor milk processed and provided by a human milk bank (HMB). The relative benefits of MOM and HMB feeding have not yet been delineated. Our center has been a leader and has been very successful in promoting the use of fresh MOM, and in 2012 we opened the first human milk bank in Poland.

OBJECTIVE

To describe the characteristics and treatment course of infants fed exclusively with MOM, as compared with those who received supplemental feedings from HMB.

METHODS

Prospectively planned observational cohort study in a tertiary care NICU.

RESULTS

During the study period (April 2012 - March 2017) 1,152 infants were admitted to the NICU. Of those, 354 infants were excluded from this cohort evaluation. Exclusions were primarily for severe congenital anomalies, admission after the first two days of life, and early death (within 7 days). Fresh MOM was the only source of enteral nutrition for 22% of these infants. The baseline characteristics and treatment course of the two cohorts (MOM = 179, HMB = 619) were quite similar. However, the MOM group was slightly larger (median [IQR] 2.0 [1.3-3.0] and 1.8 kg [1.3-2.5], p < 0.05) and less likely to require respiratory support (67% and 77%, p < 0.01). The duration of the use of central lines was slightly longer in the MOM group (8 [5-14] days and 6 [4-9] days, p < 0.01). There were no differences in the two groups with regard to ROP, NEC, or late death. Most of the infants were discharged home, receiving exclusively their mother's own milk (73%) or with some supplementation from formula (18%). Infants in the MOM group were less likely to be discharged home receiving only formula (3.4% and 7.5%, p < 0.05).

CONCLUSIONS

We demonstrated that a wide range of infants in the NICU can be feed entirely with milk from their mothers. We intend to explore the relationship between the percentage of mother's milk and outcomes.

ABS 8

PROTEIN CONTENT OF FRESH HUMAN MILK AND VARIABILITY RELATED TO PRESERVATION METHODS IN THE NICU

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INTRODUCTION

In the neonatal intensive care unit (NICU), neonates are in severe conditions and cannot be breastfed although human milk is the best nutrient. They have to be fed by parenteral nutrition initially and expressed mother's milk has to be given as soon as their condition permits. Fresh human milk is the best choice, but it is not always available, since the mother is discharged much earlier than the baby. Thus,

pumped human milk is preserved by refrigeration or freezing for variable intervals of time, in the NICU. Many studies have focused on the impact that these methods have on macro-nutrients in human milk. Proteins are essential for the growth and development of both term and preterm neonates. This study aimed to determine: a. protein content of fresh human milk in term and preterm early lactating mothers; b. variability in protein composition of refrigerated and frozen human milk.

MATERIALS AND METHODS

Two groups of lactating mothers who delivered prematurely (60 participants – group 1) and at term (30 participants – group 2) provided 9 aliquots of 1 ml pumped milk in sterile plastic containers on day 3, day 7, 14, 21, 30 and 60. Fresh milk was analyzed in the following hours by spectrophotometry with Miris AB® Human Milk Analyser (Uppsala, Sweden). Three samples were refrigerated at +4ºC for 24, 48 and 72 hours respectively and five samples were frozen at -20ºC for 1, 2, 4, 8 and 12 weeks respectively and analyzed after thawing at room temperature. Statistical analysis was performed using the SPSS® V.20.1 (SPSS, Chicago, IL, USA) and MATLAB® (MathWorks®, Natick, MA, USA) software.

RESULTS

Protein content of fresh human milk is similar in the two groups, and decreases over time in a similar manner, from a maximum of 2.03 in group 2 and 1.97 in group 1 in colostrum to 1.39 g/dL vs 1.35 g/dL in transitional milk on day 14. A significant acceleration of protein loss is observed in group 1 from day 21 (p = 0.014787), day 30 (p = 0.000867) to day 60 when protein content becomes similar in the two groups (1.04 g/dL vs 1.10 g/dL). Refrigeration of preterm milk for 72 hours decreased protein content more than in term milk, but less than freezing for 2 weeks. Colostrum suffers significant loss of protein content after 3 months of freezing, transitional milk after 2 months and mature milk after 1 month of freezing.

CONCLUSIONS

In common settings, in the absence of milk banks, refrigerated human milk in early lactation for up to 3 days is preferable to long-term freezing, in order to preserve protein content.

DECLARATION OF INTEREST

ABS 9

RIB FRACTURE INCIDENCE, DO PRETERM BONES STILL BREAK?

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INTRODUCTION

Premature infants will often present to the emergency department following their initial discharge from the neonatal unit. In the ED they may have chest X-rays performed. Very low birth weight (VLBW) infants are at increased risk of rib fractures due to osteopenia of prematurity (OOP). Reported incidence of rib fractures in premature infants varies from 1% to 10%. However, rib fractures in the ED will appropriately trigger consideration for non-accidental injury. Our primary aim was to ascertain an updated incidence of rib fractures in VLBW babies. Improved nutritional management could have reduced the rates of OOP and rib fractures.

METHODS

Retrospective review of all X-rays carried out on VLBW infants over a 5-year period in a tertiary neonatal centre. Data was also collected on the biochemical markers of OOP. We compared the biochemical markers in those babies with and without rib fractures.

RESULTS

Of the 609 VLBW infants included in the study, two cases of rib fractures were found. This represents an incidence of 3/1,000 in this population. 5.9% of these babies showed radiological evidence of OOP. Of the babies with rib fractures, one showed significant biochemical abnormalities associated with OOP, which improved with treatment. The second baby had an unexplained rib fracture without significant biochemical disturbance. Both of these babies were born before 30 weeks of gestation and had an initial hospital stay of over 10 weeks.

CONCLUSIONS

Our findings show a much lower rate of rib fracture in preterm infants than in previous studies. This would suggest that if an ex-premature infant presents acutely with rib fractures there should be an even higher suspicion of NAI than previously thought.

ABS 10

THE IMPACT OF FEEDING INTERVAL ON TIME TO ACHIEVE FULL ORAL FEEDING IN PRETERM INFANTS

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INTRODUCTION

Volume of each feed can be 1/3 smaller when the feeding interval is increased from 2 to 3 hours. The impact of feeding with 2-hour or 3-hour intervals on time to achieve full oral feeding in preterm infants was investigated.

METHODS

Infants on full enteral gavage feeding with at least 150 ml/kg were randomized into two groups when they weighed nearly 1,500 g; 3-hour feeding intervals (Q3) and 2-hour feeding intervals (Q2). The time to achieve full oral feeding (postnatal age and postmenstrual age) and the duration of oral transition (the days from first successful oral feeding to time to achieve full oral feeding) were investigated.

RESULTS

The study included 100 infants, 50 in each group. Median gestational age was 29 (28-31) weeks in both groups. The infants in the Q3 and Q2 groups had similar birth weight; Q3: 1,153 (1,000-1,380) grams and Q2: 1,228 (1,075-1,390); p = 0.322. Time to achieve full enteral feeds, time to regain birth weight, and other antenatal and clinical characteristics were similar in the Q2 and Q3 groups.

The date of randomization was 33 (32-35) weeks of PMA in the Q3 group and 24 (20-33) days and 33 (32-34) weeks of PMA in the Q2 group; p = 0.279. The infants in both groups received similar amount of feeding volume, 150 (150-160) ml/kg/day, as well as calorie and protein intake. The number of infants that required transfusion was six in the Q3 group (12%) and four in the Q2 group (8%); p = 0.505. The two groups had similar hemoglobin levels. The postnatal age (days; Q3: 40 [29-58], Q2: 38 [31-46]; p = 0.406) and PMA (weeks; Q3: 35 [35-37], Q2: 35 [34-36]; p = 0.131) at the date of full oral feeding were comparable between groups. Duration of oral transition was 12 (10-17) days in the Q3 group and 11 (9-16) days in the Q2 group; p = 0.197. Weight gain after randomization, weight at the date of full oral feeding, duration of hospitalization, and weight at discharge did not differ between the Q2 and Q3 groups.

CONCLUSIONS

We demonstrated that 2-hour feeding did not improve time to achieve full oral feeding. This observation states 3-hour feeding is appropriate for the neonatal units where less handling of preterms and decreased workload of nurses are valuable. Clinical Trial number: NCT02916914.

ETHICAL STATEMENT

This study was approved by the institutional ethics committee. Clinical Trial I.

ABS 11

AUDIT OF VITAMIN D (VD) LEVELS AND INTAKES IN THE NEONATAL UNIT

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INTRODUCTION

Evidence suggests that 200 IU/kg up to 400 IU VD daily is sufficient for most preterm babies [1] and higher doses do not appear to improve later bone health [2]. The SACN guideline published after the audit began recommends 400 IU/day for all the UK population with blood levels > 25 nmol/l being sufficient [3]. At the time of the audit, the Imperial VD guideline was based upon Tsang's guideline [1]. This was doubled to 800 IU in babies with levels < 40 nmol/l and re-tested after approximately 6 weeks as per McCarthy [4]. Babies at high risk of VD deficiency were tested, with one of the risk factors being lack of maternal VD intake during pregnancy.

METHODS

Data was collected from patient records for 141 babies born ≤ 36[+6]/40 between April 2014 - January 2017 who had VD levels tested. Mothers' VD intake during pregnancy and daily VD intake of 43 babies during treatment was recorded. Data was tested for normality using the Shapiro Wilks test.

RESULTS

Mean gestation 29[+0] weeks (SD 3.6 weeks), mean birth weight 1,142 g (SD 518 g), 63% singletons, 37% multiples. First VD level 33.3 nmol/l (IQR 18 nmol/l) tested at median 19 days of life (IQR 18 days), 68% of babies were VD deficient with completed treatment given to 99% of babies. Repeat tests done on 96% of babies. Median re-test was 6.1 weeks (IQR 2 weeks) with 81% of babies re-tested as per the guideline. Median VD intake of deficient babies was 843 IU (IQR 182 IU). Babies ≤ 27/40 had greater variability of intake than other groups (**Fig. 1**). Median VD level after treatment 62.2 nmol/l (IQR 55.2 nmol/l). No relationships were found between VD levels and mother's intake,
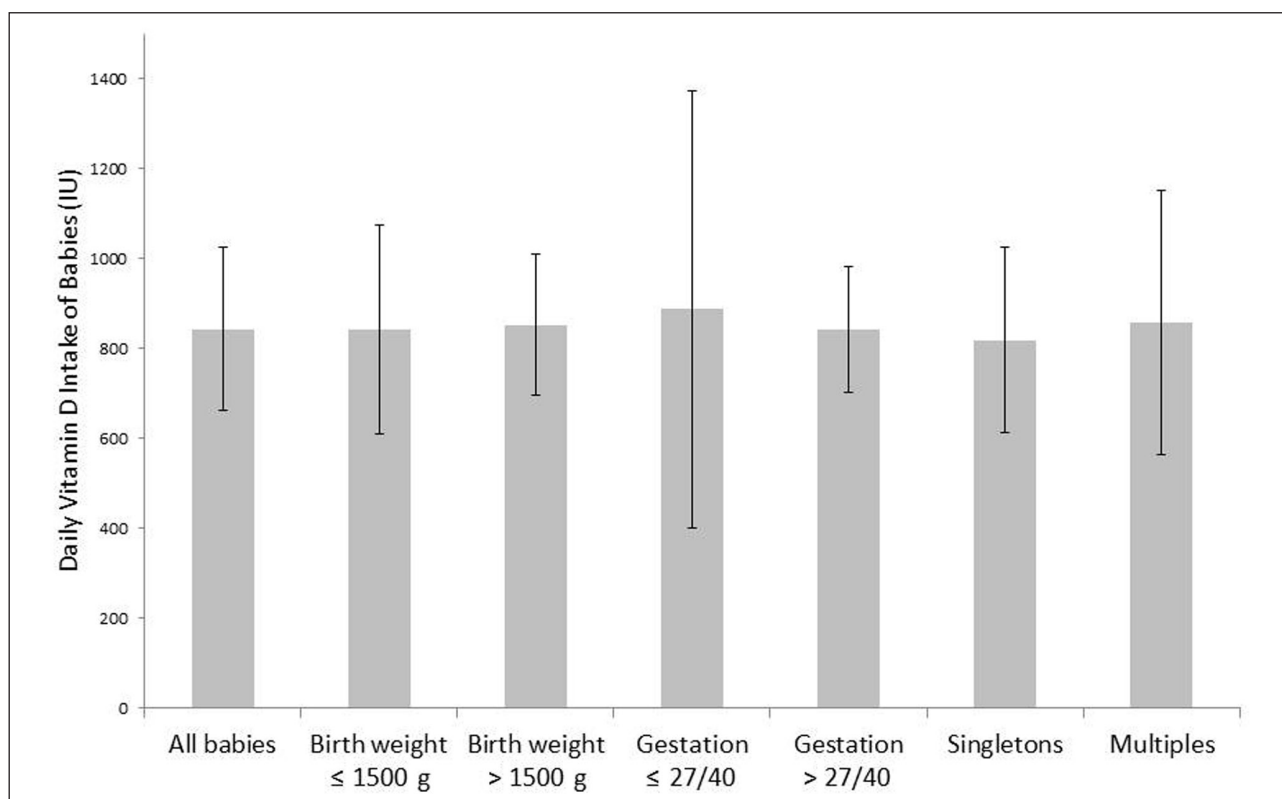
Figure 1 (ABS 11). Total daily vitamin D intake (IU) in vitamin D deficient babies receiving supplementation treatment.

birth weight, birth gestation, gestation at time of testing or whether singleton/multiples. Some babies were resistant to treatment with levels lower or unchanged after treatment. No pattern as to why these babies showed resistance was found.

CONCLUSIONS

The guideline was effective in raising the median vitamin D levels of this population; however, the IQR was high showing a wide variation in the data. A larger cohort and a research project would be ideal to explore further the ideal VD dose, length of treatment and time before re-testing in babies with VD deficiency and those resistant to treatment. It would be beneficial to explore further any relationships between VD levels in preterm infants and birth weight, gestation and mother's intake. The time between birth and testing VD was a limitation of this data with only 10% of babies tested within 2 weeks of life. Therefore, the majority of measurements reflected postnatal intake as well as placental transfer.

REFERENCES

[1] Tsang RC. Nutrition of the Preterm Infant: scientific basis and practical guidelines. 2nd Ed. Cincinnati, OH: Digital Educational Pub., 2005, p. 259.

[2] Natarajan CK, Sankar MJ, Agarwal R, Pratap OT, Jain V, Gupta N, Gupta AK, Deorari AK, Paul VK, Sreenivas V. Trial of daily vitamin D supplementation in preterm infants. Pediatrics. 2014;133(3):e628-34.

[3] SACN vitamin D and health report. The Scientific Advisory Committee on Nutrition (SACN) recommendations on vitamin D. Available at: https://www.gov.uk/government/publications/sacn-vitamin-d-and-health-report, date of publication: 21 July 2016, last access: September 2018.

[4] McCarthy RA, McKenna MJ, Oyefeso O, Uduma O, Murray BF, Brady JJ, Kilbane MT, Murphy JF, Twomey A, O' Donnell CP, Murphy NP, Molloy EJ. Vitamin D nutritional status in preterm infants and response to supplementation. Br J Nutr. 2013;110(1):156-63.

ABS 12

COMPUTERIZED NUTRITION PROGRAM USED TO IMPROVE NUTRITION IN EXTREMELY LOW BIRTH WEIGHT INFANTS

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INTRODUCTION

Introducing and conducting nutrition by applying the recommendations of the neonatal nutrition

guidelines has become a standard of care of the extremely low birth weight infants (ELBW) preterm infants in many neonatal intensive care units (NICU). The aim of the study was to assess the results of individualized nutrition of ELBW infants using a computerized program developed according to current recommendations.

MATERIAL AND METHODS

All ELBW infants admitted to our level III regional unit between 01.01.2015 and 31.12.2017 were eligible for the study if they survived to discharge. Neonatal data was obtained from the neonatal and NICU charts. Growth percentile were plugged on Fenton charts for boys and girls. Statistical analysis was performed using SPSS® 10.0 for Windows®.

RESULTS

70 ELBW infants were admitted during the study period, but only 41 survived to discharge (58.6%), mean birth weight 858.2 ± 103.8 g and mean gestational age 26.8 ± 2.0, 58.8% female infants. Parenteral nutrition was administered for 9.8 ± 2.3 days, minimal enteral nutrition was started at 4.5 ± 1.8 hours after birth, breast milk was initiated at 3.0 ± 1.9 days, mean duration of feeding with breast milk was 73.3 ± 31.2 days, formula was initiated at 2.0 ± 5.7 days, supplied or associated with breast milk for 36.9 ± 51.2 days. Individualized supplementation was started with human milk fortifier starting at 10.5 ± 2.7 days of life for 58.7 ± 25.7 days, while protein supplementation was added starting at 11.8 ± 5.7 days for 59.1 ± 25.4 days. At birth, only 2 ELBW infants had intrauterine growth restriction and at discharge they continued to be under the 3rd percentile for the corrected age. Using the computerized program and individualized supplementation 48 ELBW infants maintained, at discharge, their birth percentile (48.8%), 4 infants increased one percentile (9.8%), 6 infants increased 2 percentiles (14.6%), 3 infants lost one percentile (7.3%), 6 infants lost two percentiles (14.6%) and a further 2 infants were plugged 3 percentiles lower compared with birth (4.9%).

CONCLUSIONS

The analysis showed that applying the recommendations of the nutrition guidelines, including supplementation with human milk fortifiers and proteins, using a computerized program helps in maintaining and improving the nutritional status at discharge in most ELBW infants.

ABS 13

DOES OSMOLALITY CHANGE WHEN IN-FANT FORMULA IS FORTIFIED WITH

DEXTRIN MALTOSE FOR MANAGEMENT OF ASYMPTOMATIC HYPOGLYCEMIA?

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BACKGROUND

Neonatal hypoglycemia can be transient and is commonly observed in at-risk infants. Its management especially in asymptomatic patients remains controversial.

Preferring the oral feeding and fortifying infant formula with dextrin maltose can frequently resolve asymptomatic hypoglycemia without need for IV perfusion.

AIM

To determine whether osmolality changes when infant formula is fortified with Dextrin maltose.

MATERIALS

We undertook an experimental study within the Department of Intensive Care and Neonatal Medicine, Teaching Hospital of Monastir.

Osmolality was calculated in different artificial milk formulas fortified with dextrin maltose at different concentrations (1% to 6%).

Osmolality analyses were performed in the Pharmaceutics Galenic Laboratory of the faculty of Pharmacy of Monastir.

Osmolality measures were performed on 384 samples; each reconstitution was measured three times and the average value was considered.

RESULTS

Basic osmolality was between 259 and 339 mOsmol/l. Dextrin Maltose concentrated at 1% increased the osmolality of milk PRE-A and Milk E above 400 mOsmol/l, whereas milks PRE-B, PRE-C and PRE-D remained less than 400 mOsmol/l for a maximum concentration of 6%.

CONCLUSION

Taking into account the osmolality schedule during artificial milk supplementation is essential to prevent digestive disorders in newborns.

ABS 14

FEEDING DIFFICULTIES FOLLOWING NEO-NATAL CARDIAC SURGERY

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INTRODUCTION

Unsuccessful enteral feeding, malnutrition and growth failure seem to be rather common in neonates after cardiac surgery. This entity is associated with a poor impact on immune function, wound healing and post-operative recovery and neurodevelopment of neonates. The purpose of the current analysis is to assess feeding difficulties and identify factors associated with incomplete enteral-tube feeding in neonates who have undergone cardiac surgery.

METHODS

A retrospective, single-centered, two-year study was conducted that enrolled all neonates who had undergone cardiac surgery and were treated postoperatively in a Cardiovascular Intensive Care Unit of a third level Children's Hospital. Clinical records were evaluated for demographics, Risk adjustment for congenital heart surgery (RACHS) and enteral feeding initiation patterns.

RESULTS

Twenty-four neonates that underwent cardiac surgery during the study period were enrolled. The neonates were divided into two groups: those that initiated enteral nutrition before the fifth postoperative day (n = 9) – group 1 and those who initiated enteral feeding after the fifth postoperative day (n = 9) – group 2, late enteral feeding. However, 6 out of the 24 neonates were never fed enterally because of their severe clinical condition and death. As a result, these patients were excluded. Factors related to delayed enteral nutrition were prolonged mechanical ventilation (median duration 5 days in group 1 vs 10 days in group 2, p-value 0.008), prolonged inotrope administration (median duration 5 days in group 1 vs 10 days in group 2, p-value 0.012) and administration of sedatives and analgesics (median duration 3-4 days in group 1 vs 7 days in group 2, p-values 0.023 and 0.046), prolonged duration of thoracic and peritoneal drainage catheters (5 and 2 days in group 1 vs 4 and 7 days in group 2, p-values 0.46 and 0.06). Moreover, failure of extubation (33.4%), high rate of postoperative infection (77.8%) and delayed sternal closure (33.3%) among the neonates of group 2 had a negative effect on the progress of enteral nutrition.

CONCLUSIONS

Prolonged mechanical ventilation, longer administration of medications, high postoperative infection rates and surgical re-interventions are strongly associated with important difficulties and delays in sufficient – complete enteral feeding of neonates undergoing congenital heart surgery.

ABS 15

FIRST-YEAR EXPERIENCE OF DONOR MILK BANK AT THE VILNIUS PERINATAL CENTRE

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INTRODUCTION

Breastfeeding is the gold standard for infant nutrition, but pasteurized donor human milk (DHM) is the second best alternative for premature babies when own mother's milk (OMM) is not available. The Donor Milk Bank (DMB) was opened at the Vilnius Perinatal Centre in March 2017 aiming to collect, analyze, process and store maternal donor milk. About 350 premature babies are hospitalized at the Neonatal Centre each year. Nearly one third of the mothers do not have sufficient amounts of milk or are unable to feed their babies for different reasons. DHM is the best alternative in these cases.

METHODS

Development of guidelines

Modified local guidelines of DMB were developed and based on *Guidelines for use of human milk and milk handling in Sweden, 2011-04-01 Milk net, version 2.0.*

Design of the DMB

The DMB was designed in accordance with international standards and requirements. There are four compartments for the processing of DHM: mother's pumping room, donor's appointment room, room for milk analysis, pasteurization, and milk sampling (after pasteurization) and milk storage room.

Selection of donors and processing of donor milk

Donors are carefully selected after serologic examination of the blood as well as thorough collection of maternal history. Mothers are chosen to become donors after detailed instruction, written consent, and preliminary culture of first milk samples. Donor milk undergoes Holder pasteurization, deep freezing and storage at -20 degrees Celsius for six months. Milk culture and analysis of milk composition (infrared transmission spectroscopy by Miris Human Milk Analyser) is performed after pasteurization.
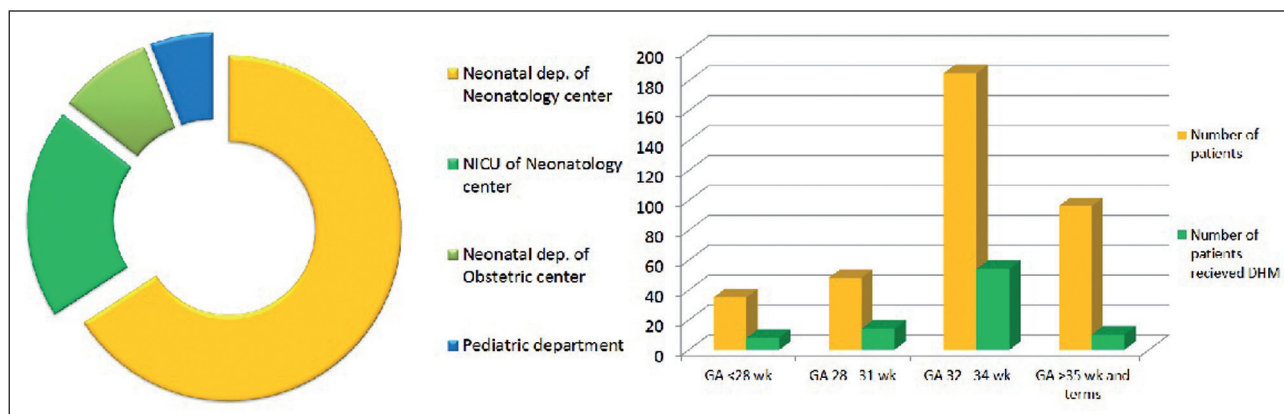
Figure 1 (ABS 15). Recipients of donor human milk DHM.

Supporting donors

We provide free of charge the supply of a breast-pump and means for milk collection.

Use of donor milk

All newborn babies born ≤ 32 weeks of GA are a target population for DHM after their mothers' written consent. The milk with the highest protein content is usually chosen for the smallest babies. The newborn babies who need intensive care and/or older babies with congenital or acquired bowel disease are the candidates for DHM supply.

RESULTS

1. 641 liters of DHM were collected during the first year of DMB activity. 56 donors were officially registered. 636 liters of DHM were given to premature and sick babies (**Fig. 1**)

2. Since May 2017, no formulas have been used for very low birth weight premature babies (≤ 32 weeks GA) at Neonatal Intensive Care and Neonatal units – all these babies are fed either with OMM, or DHM. Fortification of DHM was used in all cases.

3. Neonatal Intensive Care Unit patients as well as some complicated pediatric patients were recipients of DHM besides preterm newborn infants (**Fig. 1**)

CONCLUSIONS

The opening of DMB at the Vilnius Perinatal Centre enabled us to feed prematurely born and sick babies exclusively with human milk, completely renouncing formula feeding. Preliminary results show better tolerance of feeding. We also expect to see a decrease in neonatal mortality and incidence of NEC.

ABS 16

MOTHERS' OWN BREAST MILK FOR ELBW INFANTS: PASTEURIZED OR NOT?

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INTRODUCTION

Cytomegalovirus (CMV) is a frequent viral cause of congenital and perinatal infection. Breastfeeding is a common route for CMV transmission postnatally from seropositive mothers to neonates. It is estimated that in Greece the rate of CMV seropositive women of reproductive age is 78-90%. During lactation, up to 95% of these women may have viral reactivation and CMV shedding into breast milk. Premature neonates, especially those born with birth weight less than 1 kg and gestational age less than 30 weeks are at high risk for CMV infection via breast milk, due to the immaturity of their immune system. Postnatal CMV infection in the premature may be symptomatic and increase the risk of long-term neurodevelopmental disorders.

METHODS

We describe three cases of extremely low birth weight (ELBW) neonates (550-650 g) whose mothers were CMV seropositive. The neonates were supported with their mothers' fresh breast milk. Serological tests for CMV IgG and IgM antibodies were performed regularly on mothers and infants.

RESULTS

During their hospitalization, the infants developed postnatal CMV infection attributed to their mothers' milk, since Polymerase Chain Reaction (PCR) CMV-DNA positive was detected in all three mothers' breast milk. The symptoms appeared between the 65th and 98th day of life. Two infants presented with respiratory deterioration

and the third with a sepsis-like syndrome. In all three neonates, CMV infection was confirmed through serological testing (positive IgM and IgG antibodies) and positive PCR CMV-DNA in their blood and urine. One of the infants also had positive PCR in the cerebrospinal fluid (CSF). All neonates were treated initially with intravenous ganciclovir until the PCR samples of blood and CSF were negative and afterwards continued oral treatment with valganciclovir. It is remarkable that one of the infants in the study was the first infant of a twin gestation, and the second twin, who was also breastfeeding, did not acquire the CMV infection.

CONCLUSIONS

Feeding ELBW preterm infants with their mothers' own fresh breast milk is of paramount importance for their survival but there is a high risk of CMV transmission in ELBW infants from CMV seropositive mothers. Pasteurization inactivates the CMV virus in breast milk, but it has a negative effect on its nutrients and immune components. Among neonatologists, there is still debate as to whether the disadvantages of pasteurization outweigh the risk of CMV acquired infection.

ABS 17

OBSERVATIONAL STUDY OF VITAMIN D (VD) INTAKES AND LEVELS ON THE NEONATAL UNIT

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INTRODUCTION

There is no consensus on the assessment, interpretation, treatment or monitoring of VD in preterm babies. It is unknown exactly how VD is metabolised and stored in these babies. Relationships between VD levels and the mother's VD status [1, 2] ethnicity [1-3] and birth season [2] have been found.

METHODS

As part of an audit, data was collected on 141 babies born ≤ 36+6/40 between April 2014 and January 2017 who were tested for VD deficiency. Mothers were asked about their VD intake during pregnancy. Data was tested for normality using the Shapiro Wilks test.

RESULTS

Mean gestation was 29^{+0} weeks (SD 3.6 weeks), mean birth weight was 1,142 g (SD 518 g), 63% of babies were singletons, 37% were multiple births. Median first VD level was 33.3 nmol/l (IQR 18 nmol/l) tested at a median of 19 days of life (IQR 18 days) with 68% of all babies being VD deficient.

Mother's VD intake was unknown in 32% of babies. Of the remaining 68%: 73% took VD, 18% took it intermittently and 9% took it but had hyperemesis. No relationships were found between VD levels and the mother's intake, birth weight, birth gestation, gestation at time of testing or whether singleton/multiples. Babies tested within 3 weeks of life (25% of the sample) showed no link between gestation or birth weight and VD (**Fig. 1**). The demographics of babies with levels 25 nmol/l. Mother's VD intake was known in 77% of these babies of which 44% took VD, 34% took it intermittently/hyperemesis and 22% did not take it. Some babies were resistant to treatment with levels lower or unchanged after treatment. No pattern as to why these babies showed resistance to VD treatment was found.

CONCLUSIONS

Our data showed high variability within all areas examined and the search for potential relationships between data was likely limited by the small sample size. The VD provided to each baby was highly variable due to differing baseline milk intake, highlighting that a blanket supplement does not always correct to a specified value – as seen in half of our babies.

The time between birth and testing VD was a limitation of this data, with only 10% of babies tested within 2 weeks of life, thus the majority were reflecting not only status at birth but postnatal supplementation. It would be beneficial to explore further any relationships between VD levels in preterm infants and birth weight, gestation, mother's intake, season of birth and ethnicity.

REFERENCES

[1] Dawodu A, Nath R. High prevalence of moderately severe vitamin D deficiency in preterm infants. Pediatr Int. 2011;53(2):207-10.

[2] Monangi N, Slaughter JL, Dawodu A, Smith C, Akinbi HT. Vitamin D status of early preterm infants and the effects of vitamin D intake during hospital stay. Arch Dis Child Fetal Neonatal Ed. 2014;99(2):F166-8.

[3] Sachan A, Gupta R, Das V, Agarwal A, Awasthi PK, Bhatia V. High prevalence of vitamin D deficiency among pregnant women and their newborns in northern India. Am J Clin Nutr. 2005;81(5):1060-4.

[4] Scientific Advisory Committee on Nutrition (SACN). SACN vitamin D and health report. The Scientific Advisory Committee on Nutrition (SACN) recommendations on vitamin D. Available at: https://www.gov.uk/government/publications/sacn-vitamin-d-and-health-report, date of publication: 21 July 2016, last access: September 2018.
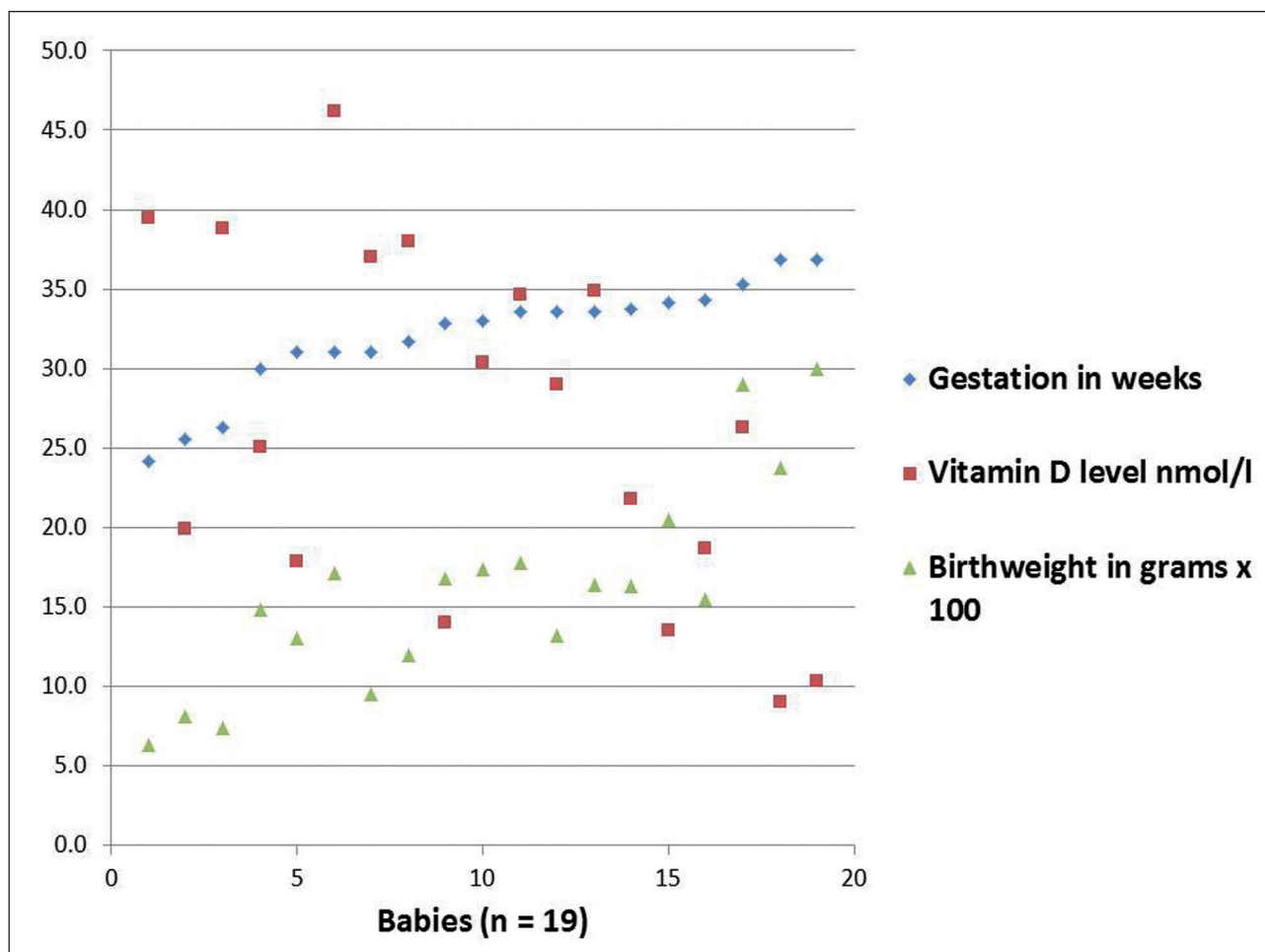
Figure 1 (ABS 17). Vitamin D level, birth weight and gestation of babies tested within 3 weeks of life.

ABS 18

RISK FACTORS FOR EXTRAUTERINE GROWTH RESTRICTION IN EXTREMELY LOW BIRTH WEIGHT PRETERM INFANTS

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INTRODUCTION

With the increasing rate of survival in extremely low birth weight infants (ELBW), more attention must be paid to the improvement of their quality of life via optimal nutrition. Suboptimal nutritional intake remains the most prominent cause of extrauterine (EUGR) growth restriction, an important risk factor for unfavorable neurodevelopmental outcome. The aim of the study was to identify risk factors for EUGR in ELBW infants, other than nutrient and calories intake.

MATERIALS AND METHODS

All ELBW infants admitted to our level III regional unit between 01.01.2015 and 31.12.2017 were eligible for the study if they survived to discharge. Neonatal data was obtained from neonatal and NICU charts. ELBW infants with good nutritional status at discharge were compared with those demonstrating EUGR in order to identify risk factors for EUGR. The same feeding protocol was applied to all infants, using a computerized nutritional program and nutritional supplements according to current recommendations. Growth percentiles were determined using Fenton charts. Statistical analysis was performed using SPSS® 10.0 for Windows®; p was considered statistically significant at values < 0.05; where appropriate OR was also calculated.

RESULTS

During the study period, 70 ELBW infants were admitted to our unit, 41 of them surviving to discharge

(58.6%). 11 of the 41 ELBW (26.8%) survivors lost 1-3 percentiles on growth charts. Compared to the other 30 ELBW infants with good nutritional status at discharge (same or higher percentile on growth charts), those with EUGR had significantly lower gestational ages (p = 0.011), more severe respiratory conditions - longer duration of respiratory support (p = 0.007) and oxygen therapy (p = 0.003), increased duration of NICU hospitalization (p < 0.001), and more frequent episodes of nosocomial infections (p = 0.010). Also, even though they started feeding with human milk sooner (p = 0.041), they received formula for a longer period of time (p = 0.003), and had a prolonged hospitalization (p = 0.050). ELBW infants with EUGR had more frequent nosocomial infections, statistically not significant (p = 0.057; OR 3.33 [0.82-13.46]).

DISCUSSION

The results of our study suggest that lower gestational age, severity of respiratory disease and frequency of nosocomial infections are the main risk factors for EUGR in ELBW infants when a standardized nutritional protocol is applied. Also, using more human milk, with appropriate nutrient supplementation, instead of formula may help prevent EUGR in ELBW infants.

ABS 19

SOCIAL AND EPIDEMIOLOGICAL FACTORS CONTRIBUTING TO MICROBIOLOGICAL CONTAMINATION OF THE HUMAN DONOR'S MILK

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INTRODUCTION

Breastfeeding is a gold standard method of feeding newborns, because it improves the holistic health of the mother-child combination [1]. Premature newborns are especially in need of human milk [2]. It decreases the risk of late-onset sepsis and necrotizing enterocolitis, and improves the neonates' growth and neurodevelopment [2]. In 2016, Lithuania opened its first human milk bank (HMB). The aim of this investigation was to identify factors that caused contamination of human milk collected in LUHSKC HMB from December 2016 to January 2018.

METHODS

Mothers (n = 75) who donated human milk were interviewed via a telephone survey. We performed retrospective analysis of the data obtained from routine microbiological tests before human milk pasteurization. We used these criteria to find possible connections between the mother's social and epidemiological factors and microbiological contamination of their milk. We performed analysis using Pearson correlation coefficient. The difference is statistically significant with p < 0.05. The data was processed using SPSS® 23.0 software.

RESULTS

We evaluated social and epidemiological factors of HMD mothers and presented them in **Tab. 1**. Of all 75 HMD mothers, 16 had full-term newborns and 59 had premature newborns. Gestation varies within the range of 23-42 weeks (median = 32). No statistically significant difference was found between the gestation of the newborn and the amount of donated milk. The most common motive of donation was described as "a wish to help" (41.3%). The microflora of the donated milk was significantly different between the city and the countryside (p < 0.033). The most common pathogens found in unused milk were Gram-negative bacilli, skin flora, nonfermenting Gram-negative bacilli and *S. aureus*. There was no statistically significant difference in milk microflora among those who used a breast pump sterilizer and those who did not, but there was a statistically significant difference between the count of microorganisms in milk samples when a breast pump sterilizer was used (p < 0.001).

CONCLUSION

Our research allowed us to reveal that mothers who had premature newborns were more active in donating human milk. There was a statistically significant difference found between the microflora of milk that was donated by mothers who live in the city and those who live in the countryside. We also proved more efficient use of HDM with breast pump sterilization.

REFERENCES

[1] Barbosa dos Santos JA, dos Santos Braga Diégues Serva VM, Costa Caminha MF. Reasons for human milk donation according to different per capita income. Rev Bras Saude Mater Infant. 2017;17(2):307-15.

[2] Underwood MA, Scoble JA. Human milk and premature infant: Focus on use of pasteurized donor human milk in nicu. In: Rajendram R, Preedy VR, Patel V (Eds.). Diet and Nutrition in Critical Care. New York: Springer, 2015, pp. 795-806.

Table 1 (ABS 19). Social and epidemiological survey results of human milk donors in Lithuanian University of Health Sciences Kaunas Clinics HMB.

Questions	Answers	n	%
HMD [a] age	< 25	3	4
	25-30	37	49.3
	> 30	35	46.7
Residence	City	58	77.5
	Village	17	22.7
Number of children	1	49	65.3
	2 or 3	25	33.33
	> 3	1	1.3
Breastfeeding of earlier children	Yes	25	96.2
	No	1	3.8
Duration of breastfeeding	< 3 months	8	32
	< 6 months	5	20
	< 12 months	10	40
	> 1 year	2	8
Delivery method	Vaginally	43	57.3
	Cesarean section	32	42.7
Their newborns received HDM [b]	Yes	39	52
	No	36	48
Human milk donation motives	A wish to help	31	41.3
	Too much milk	26	34.7
	Both	18	24
Education	University	38	50.7
	College	16	21.3
	Vocational school	8	10.7
	High school	9	12
	Middle school	4	5.3
Marital status	Married	60	80
	Committed relationship	11	14.7
	Single	4	5.3
Breast pump	Personal	35	46.7
	Property of hospital	28	37.3
	Both	16	16
Breast pump type	Electric	47	62.7
	Manual	18	24
	Both types	10	13.3
Breast pump sterilizer	Used	48	64
	Did not use	27	36
Breast pump cleaning	Used sterilizer after every breast pumping	36	48
	Used boiling water after every breast pumping	31	41.3
	Used both types of sterilization after every breast pumping	7	9.3
	Used any method but not after every breast pumping	1	1.3

[a] HMD: human milk donor; [b] HDM: human donor's milk.

ABS 20

EFFECT OF FORTIFICATION ON THE OSMOLARITY OF INFANT MILK FORMULA

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OBJECTIVES

To evaluate the osmolarity of different infant milk formula before and after supplementation by Dextrin maltose, 10% Dextrose solution and Eoprotine®, at different concentrations.

MATERIALS AND METHODS

We undertook an experimental study within the Department of Intensive Care and Neonatal Medicine Teaching Hospital of Monastir. Osmolarity was calculated on different artificial milk formulae fortified separately by Eoprotine®, 10% dextrose solutions and maltodextrin at different concentrations (1% to 6%). Osmolarity analyses were performed in the Pharmaceutics Galenic Laboratory of the Faculty of Pharmacy of Monastir.

RESULTS

The study of osmolarity was performed on 384 samples; each reconstitution was measured three times and the average value was assessed. The basic osmolarity was between 259 and 339 mOsmol/l. Eoprotine® was added to premature milk; osmolarity of milk PRE-A surpassed 400 mOsmol/l at the concentration of 2% Eoprotine®. Dextrin Maltose concentrated at 1% increased the osmolarity of milk PRE-A and Milk E above 400 mOsmol/l whereas milks PRE-B PRE-C and PRE-D remained less than 400 mOsmol/l for a maximum concentration of 6%. All milks enriched with 10% dextrose solution exceeded 400 mOsmol/l and this was observed from a concentration of 2% dextrose solution except for milk PRE-B which joined them at 3%.

CONCLUSION

Taking into account the osmolarity schedule during infant milk formula supplementation is essential to prevent digestive disorders in newborns.

ABS 21

ENTERAL NUTRITION IN EXTREMELY LOW BIRTH WEIGHT NEWBORNS

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INTRODUCTION

Minimal enteral nutrition involves early initiation of low-volume hypocaloric feeds in order to stimulate the development of the immature gastrointestinal tract of the extremely low birth weight newborn and enhance digestive tolerance. Aims: The authors aimed to determine the effect of early trophic feeding on digestive tolerance and to determine the effect of formula milk compared with human breast milk on growth and development in preterm infants.

MATERIALS AND METHODS

The study was carried out in the Premature and Neonatology Department over two years on a group of 34 premature newborns with birth weight between 800 and 1,000 grams.

RESULTS

All the newborns received early trophic feeding (formula milk – group I, human breast milk – group II) associated with parenteral nutrition. Once minimal enteral feeding was started, the newborns in both groups received the same type of milk (breast milk or formula). The newborns were monitored for any evidence of digestive intolerance and their growth curves were followed. Weight was monitored from birth until the babies weighed 2,500 grams. The newborns fed with powder milk formula had a rate of weight gain per day 19.5% lower than that of the newborns fed with breast milk. The weight gain differences between the two groups (approximately 20 grams) were clinically significant because the lot studied comprised newborns with extremely low birth weight (< 1,000 g).

CONCLUSIONS

Minimal enteral feeding with human breast milk compared with minimal enteral feeding with formula milk improves weight gain. Neonatal intensive care should promote natural nutrition as being the best neonatal metabolic support.

ABS 22

IS HYPOPHOSPHATEMIA A RISK FACTOR FOR METABOLIC BONE DISEASE?

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INTRODUCTION

Despite significant advances in improving premature postnatal nutrition, metabolic bone disease remains a frequent and serious complication in low birth weight infants, extreme prematures and those with associated chronic conditions. The real incidence of the disease is still unknown due to a lack of consensus on the definition of the disease and clear diagnostic criteria. It is estimated to occur in 16-40% of very low birth weight infants. Although the disease starts from the first week of life, clinical and radiological signs are detected later, at 2-4 months postnatal age. Inadequate calcium and phosphorus stores and inadequate intake in a high-degree skeletal growth are the most commonly involved factors. Early aggressive parenteral nutrition in the first week of life is associated with hypophosphatemia and hypercalcemia. Later the deficit of calcium, phosphorus, zinc, copper and vitamin C leads to abnormal collagen synthesis followed by osteopenia and rickets. The most common biochemical changes are hypophosphatemia and hyperphosphatasia; the gold standard diagnostic tool is the evaluation of bone mineral content. Hypophosphatemia is the earliest marker of disrupted mineral metabolism and it can be detected at 7-14 days after birth. The aim of the study is to evaluate the dynamics of phosphocalcic metabolism from birth up to 40 weeks corrected age in preterm newborns below 32 weeks gestational age and 1,500 g birth weight, fed with own mother's milk or preterm formula.

METHODS

We conducted a descriptive exploratory retrospective study on 85 preterms with birth weight below 1,500 g and gestational age below 32 weeks who were admitted to the 2nd Neonatology Department, of the Emergency County Hospital Cluj-Napoca, from January 2000 to December 2003, fed with human milk or infant formula. Calcium,

phosphorus and alkaline phosphatase serum and urinary levels and urinary phosphorus resorption were recorded at 7 days, 1 and 2 postnatal months. Data were collected from medical records. Qualitative variables were summarized as percentages and associated 95% confidence intervals. Quantitative variables were summarized as mean and standard deviation whenever data proved normally distributed; otherwise median and interquartile range were used. To compare proportions between groups, the Z test was used. The comparison of quantitative variables between the two groups was performed using student t test for independent samples whenever data proved normally distributed, otherwise the Mann-Whitney test was applied. Statistical analysis was conducted using the Statistica program.

RESULTS

At 40 weeks corrected age, phosphorus values were significantly lower and alkaline phosphatase significantly higher in preterm infants fed with human milk.

CONCLUSIONS

Treatment strategies should include the optimization of nutrition and appropriate calcium and phosphorus supplementation. Recommendations for screening and monitoring and treatment strategies are needed.

ABS 23

THE EFFECT OF INTERMITTENT AND CONTINUOUS FEEDING ON GROWTH AND TIME TO DISCHARGE IN VERY LOW BIRTH WEIGHT INFANTS

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INTRODUCTION

The aim of study was to determine the effect of intermittent and continuous feeding on growth and time to discharge in very low birth weight (VLBW) infants.

METHOD

The study was designed as a prospective, randomized controlled study, and was carried out between February 2016 and February 2017. During this period, preterm infants with birth weight ≤ 1,500 grams and admitted to the NICU were enrolled. The babies were randomized into continuous feeding (n = 41) and intermittent feeding (n = 39) groups. The effects of the two nutrition models on early morbidity in preterm infants were investigated.

RESULTS

Mean gestational age and birth weight were 29.3 ± 1.7 weeks and 1,331 ± 266 grams in the continuous feeding group and 29.4 ± 1.8 weeks and 1,339 ± 319 grams in the intermittent feeding group (**Tab. 1**). The groups were found to be homogeneously distributed statistically. No significant differences were found in time to reach birth weight, maximum weight loss rate, number of days TPN received, duration of transition to full enteral feeding and oral feeding, development of feeding intolerance, duration of mechanical ventilation and intensive care stay, gestational week at discharge between the two groups. Necrotizing enterocolitis (NEC) developed in 34.1% of the infants in the continuous feeding group and in 28.2% in the intermittent feeding group. The difference between NEC development

Table 1 (ABS 23). Distribution of some variables of preterm infants according to nutrition models.

	Nutrition models					
	Continuous feeding (n = 41)		Intermittent feeding (n = 39)			
Gender	**n**	**%**	**n**	**%**	**X^2**	**p**
Female	15	36.5	18	44.7	0.385	0.496
Male	26	63.5	21	55.3		
	x̄	**Ss**	**x̄**	**Ss**	**t**	**p**
Gestational age (weeks)	29.3	1.7	29.4	1.8	-0.310	0.758
Birth weight (g)	1,331	266	1,339	319	-0.131	0.896
Weight at discharge (g)	2,391	406	2,507	519	-1.109	0.271
Head circumference at birth (cm)	27.4	2.2	27.9	2.3	-1.144	0.256
Head circumference at discharge (cm)	31.7	1.8	32.3	1.4	-1.488	0.198
Time to reach birth weight (day)	9.6	3.0	9.8	4.3	-0.255	0.800

t: independent t-test.

frequency and duration of NEC development was statistically insignificant (p > 0.05).
CONCLUSIONS
As a result of the study, no difference in outcome (growth and time to discharge) could be determined for the two different nutrition models applied to preterm infants. No advantage of either of the two feeding patterns could be detected.

ABS 24

ANTENATAL AND POSTNATAL ASPECTS OF PRETERM NEWBORNS WITH AND WITHOUT INTRAUTERINE GROWTH RESTRICTION

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INTRODUCTION
Intrauterine growth restriction represents both individually but especially when associated with prematurity an important risk factor for neonatal mortality and morbidity. There is no consensus regarding the monitoring of growth increase in preterm newborns or what their ideal model of growth is, especially after term-corrected age. The concept that growth in preterm newborns should match that of full-term newborns is not supported by evidence and in practice is rarely achieved, particularly for former extreme preterms. Therefore, at discharge, many preterms are classified as extra-uterine growth restricted.
OBJECTIVE
To assess the relationship between fetal pathological changes detected by Doppler ultrasound, associated maternal pathology and the postnatal subsequent evolution of preterm newborns with and without intrauterine growth restriction in a third level maternity facility.
METHODS
We analyzed in a retrospective study all births in the period 01.01.2016-31.05.2018 in the National Institute for Mother and Child Health - Polizu Maternity. We selected mother-newborn couples and obtained maternal and neonatal data from medical records. Information was collected on the possible maternal etiopathogenesis, concomitant prematurity with intrauterine growth restriction and neonatal information regarding anthropo-metric growth and adaptation to extra-uterine life.

The exclusion criteria for the lot studied were malformations, congenital infections, fetal death and gestational age ≥ 34 weeks.
RESULTS
Between 01.01.2016-31.05.2018 out of all live births, 19% had gestational age at birth < 37 weeks and 21% weighed less than 2,500 g. Among preterm neonates, 51% had a gestational age between 34-36 weeks, 32% had a gestational age between 29-33 weeks, and 17% had gestational age ≤ 28 weeks. The vast majority of cases of prematurity with intrauterine growth restriction were caused by maternal hypertension and pre-eclampsia and presented postnatal growth restriction.
CONCLUSIONS
Post-neonatal growth and development should be monitored carefully to avoid the overlapping of negative effects.

ABS 25

NEONATAL NECROTIZING ENTEROCOLITIS: SHORT-TERM PROGNOSIS

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INTRODUCTION
Necrotizing enterocolitis (NEC), a disease affecting predominantly premature infants, is the most common gastro-intestinal emergency in neonatal intensive care units (NICUs) and a leading cause of morbidity and mortality.
AIM
To describe the short-term prognosis of infants who developed NEC in a NICU.
POPULATION AND METHODS
A retrospective survey covering 7.5 years (from June 2009 to December 2016) at Monastir Intensive Care and Neonatal Medicine Department. The diagnosis was based on clinical, biological and radiological clues.
RESULTS
32 neonates developed NEC during their hospitalization. Mean gestational age at admission was 33.4 SA [26-40 SA]. Average weight was 1,980 g [800-3,500 g]. An antenatal pathological Doppler was noticed in 6 cases and Small for Gestational age was noticed in 11 cases. Three newborns had a positive infectious anamnesis, their mothers received

antibiotics before delivery. Twelve newborns had triple antibiotic therapy for suspicion of early onset infection. One newborn baby required vasoactive drugs before the onset of the NEC. Enteral feeding introduced at 3 days of life. The occurrence of NEC was observed 3 days after the introduction of the diet with mother's milk or premature formula. Most patients had stage I NEC, only one had stage II and one had intestinal perforation (stage IV). All infants received antibiotics such as imipenem and amikacin for 17 days [15-21]. The only germ isolated from blood culture was *Klebsiella pneumoniae* ESBL for two neonates. The outcome was unfavorable in 60% of cases with, an average age of death of 24 days [2-52]. The leading cause of death was severe refractory sepsis.

CONCLUSION

The best way to manage such a devastating disorder (NEC) is prevention and early diagnosis. Prevention is based on the rational use of antibiotics in the prenatal and postnatal periods, progressive and careful enteral feeding preferably by breast milk and close monitoring of signs of digestive tolerance.

New fortifiers of breast milk

ABS 26

THE EFFECT OF BREASTFEEDING ON MATERNAL CARDIOVASCULAR HEALTH

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INTRODUCTION

Breastfeeding is associated with a protective effect on the health of mothers and infants. Epidemiological data show that women who do not breastfeed have a higher risk of cardiovascular disease. Studies have shown that breastfeeding affects all known risk factors for coronary artery disease.

MATERIAL AND METHOD

The bibliography of the last 10 years was studied.

RESULTS

In 2008, only 16% of women in urban and 30% in rural areas, exclusively breastfed their babies for 6 months as recommended by the WHO. Ram et al.

(2008) found a 1.3-fold higher risk of metabolic syndrome in middle-aged women who had not breastfed. Schwarz et al. (2009) found an increased risk of 10% -20% of diabetes, hyperlipidemia and cardiovascular disease in women who had not breastfed. In the Nurses' Health Study (2009), women who had not breastfed were 1.3 times more likely to have a heart attack. Natland et al. (2012) analyzed population study findings of 21,368 women, 20-85 years of age. Women of 50 years or younger who had not breastfed had higher prevalence of hypertension, obesity and diabetes, twice the risk of hypertension, three times the risk of obesity, five times for diabetes. In women over 50 years there were no clear correlations. Gunderson et al. (2015) found that 17% of women who had breastfed less than 1 month had atherosclerotic plaques. A new large-scale prospective study by Sanne (2017) shows that breastfeeding can help mothers reduce the risk of heart attack and stroke for at least a decade after childbirth (302,669 women, 35-79 years old in 5 urban and 5 rural areas of China, no history of cardiovascular disease). The follow-up was for 8 years. Each additional 6 months of breastfeeding per child was associated with a 4% lower risk of cardiovascular events. For strokes there was no statistically significant difference.

CONCLUSION

Long-term breastfeeding has been positively correlated with a reduction in cardiovascular risk in women, particularly around 50 years and younger.

ABS 27

DURATION OF BREASTFEEDING AND FACTORS ASSOCIATED WITH EARLY BREASTFEEDING CESSATION IN A TUNISIAN POPULATION

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AIM

To asses breastfeeding duration and to identify factors associated with early breastfeeding weaning in a Tunisian population.

METHODS

We conducted a prospective study involving infants born between March 1st and 31st 2017 at the

department of neonatal Intensive Care, Teaching Hospital of Monastir. Mothers were asked about breastfeeding before feeding and every month until their babies reached 6 months of age. The mothers and their babies were examined at the maternity.

RESULTS

We enrolled 145 newborns. Seventy-eight per cent of infants were breastfed before hospital discharge, of these, 70% were exclusively breastfed. After a period of 6 months: 16.5% of infants were exclusively breastfed, 5% had mixed feeding with dietary diversification, 14 % of mothers had stopped breastfeeding. The average age of breastfeeding cessation was 2 months. Factors predisposing to breastfeeding cessation in the early months of life were: Maternal perceptions of insufficient milk supply (50%), nipple abnormalities (25%), breast milk either did not come in or dried up (10%) and difficulties encountered during breastfeeding at the maternity. Seventy per cent of women had not received any education on breastfeeding before pregnancy.

CONCLUSION

Educating expectant and new mothers about the benefits of breastfeeding, especially women who encounter multiple barriers and are at risk of early cessation of breastfeeding, and supporting them in developing efficient techniques and problem-solving skills can help to increase the duration of breastfeeding.

New guidelines of parenteral nutrition and phosphocalcic metabolism

ABS 28

DETERMINANTS OF NEONATAL VITAMIN D STATUS IN PRETERM INFANTS AT BIRTH – CROSS-SECTIONAL STUDY

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INTRODUCTION

In Poland, there is a widespread vitamin D deficiency in pregnant women and their offspring born at 37/7 gestational age (GA) or longer, but there is little data on vitamin D resources in premature infants. Aim of the study: To determine the factors affecting the concentration of 25-hydroxyvitamin D (25OHD) in umbilical cord blood in newborns born ≤ 32 GA.

MATERIALS AND METHODS

69 consecutive mother-newborn pairs, born ≤ 32 GA in a Tertiary level perinatal care centre. 25OHD concentration in umbilical cord blood and maternal blood was determined by electrochemiluminescence (ECLIA, RocheDiagnostic).

RESULTS

25OHD concentration in umbilical cord blood was on average 26.81 ± 13.41 ng/ml, in the mother's blood it was 22.77 ± 10.87 ng/ml. A positive correlation was found between these two values ($r = 0.46$, $p < 0.0001$). The concentration of 25OHD ≤ 30 ng/dl was found in 58 (84.06%) mothers and 43 (62.32%) newborns. Significantly higher concentration of 25OHD was observed in umbilical cord blood if the mother taken vitamin D3 supplements during pregnancy (31.60 ± 13.61 ng/ml vs. 20.06 ± 8.69 ng/ml, $p = 0.0005$). Maternal age, BMI, order of pregnancy, duration of pregnancy, illnesses during pregnancy, season of birth and birth weight of the child did not affect the concentration of 25OHD in the newborn.

CONCLUSIONS

Insufficient supply of vitamin D occurs in over half of newborns born prematurely and over three-quarters of their mothers on the day of delivery, regardless of the duration of pregnancy. Vitamin D supplementation during pregnancy has a positive effect on vitamin D resources in the mother's body and their offspring, but it is still not optimal. Consideration should be given to determining 25OHD in umbilical cord blood of premature infants to determine the appropriate dose of vitamin D at birth.

ABS 29

SERUM ALUMINUM LEVEL IN PRETERM INFANTS: IS IT IMPORTANT?

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INTRODUCTION

In premature infants, serum aluminum levels (SAD), the risk factors affecting these levels and the effects of SAD on parathyroid hormone and bone structure were investigated.

METHODS

Our study was designed as a prospective, single-center study. During the first 14 days of life, preterm infants with at least 7 days TPN and gestational age $\leq$ 32 weeks were included in the study. Serum aluminum levels were measured from the cord blood and on the 14th day from the serum. The relationship between SAD on the 14th day, and TPN duration and the treatment drugs given was examined. The sample size was determined as 45 babies at the 95% power 0.05 alpha significance level. The study was approved by the local Ethics Board (01/11/2016).

RESULTS

Study completed with 45 infants meeting the criteria. Mean birth weight was $1,219 \pm 432$ grams and gestational age was 29.0 ± 2.3 weeks. 62.2% of the patients were male, and 88.9% of them had a birth-type cesarean and antenatal steroid application rate of 86.7%. Mean aluminum value was determined as 3.35 ± 1.73 µg/L in cord blood and 4.79 ± 3.54 µg/L in serum on day 14. The increase in the amount of aluminum was 1.44 ± 3.86 µg/L ($p = 0.021$). The increase in aluminum level correlated with the amounts of furosemide ($p = 0.012$), calcium ($p = 0.044$) and magnesium ($p = 0.008$) given to the infants. There was no relationship between SAD and duration of TPN administration, TPN fluid content, protein, lipid content, dopamine and dobutamine administration.

CONCLUSIONS

Serum aluminum levels on the 14th day in preterm infants are significantly increased. It was determined that the most important factors affecting this increase were the administration of furasemide, calcium and magnesium drugs. There is a need for extensive studies on aluminum toxicity in preterm infants.

Potential nutrients related to infection

ABS 30

PROBIOTIC SUPPLEMENTATION IN TERM NEWBORNS DELIVERED BY CESAREAN SECTION: A RANDOMIZED, PROSPECTIVE CLINICAL TRIAL

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OBJECTIVES

The gut microbiota plays a pivotal role in the maintenance of human health. There are numerous factors, including the mode of delivery, that impact early gut colonization. Recent research focuses on the use of probiotics in the prophylaxis of gut dysbiosis in newborns delivered by CS. We aimed to investigate whether a probiotic supplement in newborns delivered by cesarean section (CS) could alter the pattern of gut colonization and have an effect on decreasing risk of dysbiosis.

METHODS

a prospective, randomized trial with a control group. 150 newborns, born at 38-40 weeks of gestational age, delivered by CS were included in the study. They were randomized into 2 groups – interventional supplemented with the probiotic containing *Bifidobacterium breve PB04* and *Lactobacillus rhamnosus KL53A* (FFBaby, IBSS BioMed SA, Poland) and control. Stool samples were obtained on the 5th and 6th days of life and after one month of life, and were analyzed microbiologically in the lab. Next, the genus and species of the bacterial colonies were identified and quantified.

RESULTS

Staphylococci and *Bacteroides* were present in the stool samples of the newborns delivered by CS. *Bifidobacterium* and *Lactobacillus* were detected only in 10% and 9% of the control group. Newborns receiving probiotics were colonized already on the 4-5th day by *Lactobacillus* in 91% and *Bifidobacterium* in 80%. A supplement of two probiotic bacteria on the first day of life after CS resulted in rapid, long-lasting and abundant colonization of the newborns' gut.

CONCLUSION

The delivery mode influences the diversity and colonization pattern of infants' gut microbiota.

Little is as yet known about the effect of probiotic supplementation on the intestinal microbiota of newborns delivered by CS.

A supplement of two probiotic bacteria on the first day of life after CS resulted in rapid and long-lasting colonization of the newborns.

There was a decline in the amount of *Staphylococci* in the stool samples of patients who received probiotics.