Abstracts

Selected Abstracts of the 1st Congress of joint European Neonatal Societies (jENS 2015) · Session "Other"

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PROGRAMME COMMITTEE

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POSTER PRESENTATIONS

Involvement of parents in care

ABS 1

TELEMEDICINE IN NEONATAL HOMECARE

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INTRODUCTION

Neonatal homecare (NH) is an alternative to hospitalization for healthy preterm infants dependent only on tube feeding. NH implies parents managing tube feeding while establishing breastfeeding at home with support from neonatal nurses offering home visits regularly, until breastfeeding is established. Home visits are time consuming and challenging for neonatal units covering big geographical areas and therefore replacements for home visits should be considered. The aim of this study is to identify parent's needs when receiving NH and thereby identify requirements to a telemedicine device if NH should be provided with support from telemedicine.

PATIENTS AND METHODS

This abstract describes the first phase of three in a Participatory Design (PD) process. Qualitative methods have been used and data have been collected from: 1. observational studies and interviews with parents having preterm infants discharged to NH; 2. focus group interviews and a creative work-shop with parents, nurses and doctors respectively assigned the neonatal unit planning to offer NH with telemedicine. Totally, 24 parents, 5 nurses and 2 doctors participated. Further, according to the PD process, IT-engineers participated in the creative work-shop. Qualitative data has been analyzed with systematic text condensation (**Tab. 1**).
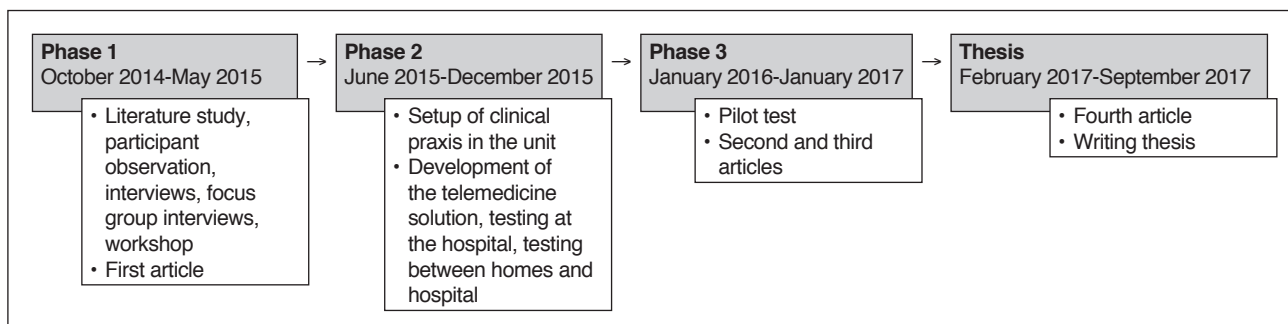
RESULTS

Parents with infants discharged to NH experienced improved family conditions, independence and a feeling of being safe at home. Parents with healthy preterm infants in the neonatal unit planning to offer NH with telemedicine experienced lack of involvement in infant care, a challenge in maintaining family life and feeling of being safe with the support from nurses. The feeling of being safe at home should be delivered through the telemedicine device and provide an open communication source between the neonatal unit and family home. The telemedicine device should provide the possibility of chat, written information, upload of pictures and movies and video. The nurses required a suitable telemedicine device being able to provide safe and adequate NH from the distance and thereby make the families feel safe at home.

CONCLUSIONS

A recurring theme is the feeling of being safe at home when providing NH. Based on the results so far a telemedicine device will be developed

Table 1 (ABS 1). The 3 phases of the Participatory Design (PD) process.

Phase 1 October 2014-May 2015	Phase 2 June 2015-December 2015	Phase 3 January 2016-January 2017	Thesis February 2017-September 2017
• Literature study, participant observation, interviews, focus group interviews, workshop • First article	• Setup of clinical praxis in the unit • Development of the telemedicine solution, testing at the hospital, testing between homes and hospital	• Pilot test • Second and third articles	• Fourth article • Writing thesis

containing the desired elements, and tested in the neonatal unit and at home to ensure the device is suitable for parents and hospital staff. Finally a pilot study will be conducted by offering 50 infants and their parents NH with telemedicine.

ABS 2

ACCEPTABILITY OF PARENT REPORT QUESTIONNAIRES FOR ROUTINE FOLLOW-UP IN LATE/MODERATELY PRETERM INFANTS

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INTRODUCTION

Late and moderately preterm (LMPT) infants are at risk of long-term problems compared with term-born infants, but are not routinely followed up. There are now calls for routine surveillance to allow early identification of developmental problems in this group. Follow-up for very preterm babies involves routine outpatient evaluation and formal developmental assessment, which is not feasible in the larger LMPT population. Parent report questionnaires may provide cost-effective developmental screening. We sought to determine parent perceptions of the acceptability of using a parent report questionnaire to identify developmental problems at two years corrected age in infants born LMPT.

PATIENTS AND METHODS

This study was conducted during the follow-up period of the Late And Moderately preterm Birth Study (LAMBS), a population-based study of infants born at 32^{+0}-36^{+6} weeks of gestation between September 2009 and December 2010 in the East Midlands region of the United Kingdom. An experienced qualitative researcher interviewed parents of LMPT infants participating in the LAMBS-2 study. This was an ancillary study designed to evaluate the clinical utility of using a parent report questionnaire as a developmental screening tool at two years corrected age. In this study, parents completed the Parent Report of Children's Abilities-Revised (PARCA-R) and the children also received a formal developmental assessment using the Bayley Scales of Infant and Toddler Development-III (Bayley-III).

RESULTS

Parents of 41 infants were interviewed. Overall, they reported that completing the questionnaire was acceptable and even enjoyable. However, this was in the context of a study in which formal developmental assessment by a member of the research team would also take place. Parents were less comfortable with the concept of using this approach routinely as a sole method of follow-up where the 'safety net' of formal assessment would not be available. They expressed some uncertainty about how to rate their child's abilities using this questionnaire and concerns about potential consequences if they 'got it wrong'. Parents felt that they lacked the degree of detachment needed to produce an objective and valid assessment of their child and were concerned that they may unwittingly give them the 'benefit of the doubt' and overestimate their abilities, which might place the child at a disadvantage.

CONCLUSIONS

Effective use of questionnaires for screening at two years corrected age is dependent on the acceptability to parents of this approach. Our findings suggest that further consideration of the concerns generated by placing parents in a 'quasi-professional' role may be needed before parent report questionnaires can successfully be adopted for use in routine follow-up of infants at risk of developmental problems.

ABS 3

INTERNATIONAL CARE PRACTICES AROUND AN INFANT'S DEATH IN THE NICU; A SURVEY STUDY

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INTRODUCTION

Neonatal mortality rates range from 6 to 11 per 1,000 births. This implicates that a significant number of infants die in the Neonatal Intensive Care Unit (NICU). The death of an infant has profound effects on parents and family members. Therefore, support and bereavement services are important to provide psychological and practical support to parents whose baby died in the NICU. The aim of this study was to explore bereavement practices and follow-up care in NICUs worldwide, with the ultimate goal to learn from best practices.

PATIENTS AND METHODS

An online questionnaire, translated in 12 different languages, was made available on Survey Monkey®. The survey was promoted on social media (Google

Groups®, Facebook®) and sent to email addresses we collected from the NIDCAP community. In the survey, we asked how hospitals organize the care around the dying process. For example by questions on: available space for the parents and their dying child, remembrances given to parents, follow-up care and religious support. Data were collected from December 2014 till March 2015. Descriptive analysis of the data was carried out.

RESULTS

We received responses from 111 different NICUs representing 37 countries. Bed numbers varied from 10 to 96 beds. Parents are welcome 24 hours in 82.7% of the NICUs, one to two hours per day in four (3.6%) units and in one NICU, parents were not allowed to visit at all. In 81% of the NICUs parents are encouraged to hold their baby during the dying process. In 20.9% of the NICUs it is not customary for parents to wash their baby after death. There was a trend towards a restricted visiting policy and/or fewer rituals in settings from Asian, Eastern Europe and Arab countries. Different remembrances are offered; 79.1% of the units provide photographs, 70.9% foot or handprints, 58.2% a lock of hair and 32.7% a diary kept by nurses. Follow-up care is given in 82 NICUs (74.5%). Almost half of the hospitals organize memorial services, once or twice a year.

CONCLUSIONS

Most NICUs provide supportive care to parents during the dying process of their infant. There are differences in the level of this care between regions but within Western Europe there is more unity. It would be worthwhile to study if these differences are related to culture and religion.

ABS 4

ANXIETY AND DEPRESSION OVER TIME, IN MOTHERS OF VERY PRETERM BORN CHILDREN

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INTRODUCTION

Preterm birth has a negative impact on child development, parental well-being and parent-infant interaction. Interventions targeting responsive parenting behaviour can improve developmental outcomes. However, maternal anxiety and depression are negatively associated with the quality of maternal interaction behaviour. Evaluating anxiety and depression during a parenting intervention is important for identifying those at risk and timely intervention. Our aim was to determine the change in anxiety and depression in mothers of very preterm born children from hospital discharge to 12 months corrected age and to study which variables are associated with the change in anxiety and depression.

PATIENTS AND METHODS

Participants were mothers (n = 345) of very preterm children (gestational age [GA] < 32 weeks and/or birth weight < 1,500 grams) who participated in a responsive parenting intervention. This ToP programme consists of 12 home visits in the first year and is reimbursed by the Dutch Health Insurances. In this longitudinal study, anxiety and depression were assessed with the Hospital Anxiety and Depression Scale (HADS). Mothers filled in the HADS after their child was discharged from hospital and at the end of the intervention. Outcomes were compared to the HADS of a Dutch reference group of mothers (n = 223), with a similar age range (23-43 year). Linear regression was performed to study which child or maternal variables were associated with change in anxiety and depression.

RESULTS

Mothers of a very preterm child (mean GA: $29^{1/7}$) had a significant decrease in both anxiety (mean 6.2 vs. 4.9, $p < 0.001$) and depression (mean 5.1 vs. 3.6, $p < 0.001$). Changes in anxiety and depression were highly correlated ($r = 0.64$). At 12 months corrected age (CA), anxiety scores were comparable to a Dutch reference group of mothers, but depression was significantly higher (mean 3.6 vs. 2.8, $p = 0.004$). Decrease in anxiety was associated with younger maternal age. Decrease in depression was associated with lower birth weight and GA. Linear regression showed that maternal age remained significant for change in anxiety when baseline anxiety was added to the model. However, when baseline depression was added to the model for change in depression, birth weight and GA were no longer significant. At 12 months CA, mothers 40 years and older were significantly more anxious and depressed than younger mothers.

CONCLUSIONS

The high levels of anxiety and depression of mothers of very preterm children decreased significantly during the first year. However, depressive scores remain increased after 12 months, and may need

more specific attention. Our results show that the change in anxiety and depression is not associated with infant risk factors at birth. However, older mothers showed less improvement and may need more targeted intervention.

ABS 5

LONGITUDINAL CHANGE OF HEALTH-RELATED QUALITY OF LIFE EXPERIENCED OVER TIME BY MOTHER WITH LATE PRETERM INFANT

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INTRODUCTION

Late preterm infants (LPIs) had more frequent hospitalizations and increased health care utilization after birth. Furthermore, LPIs were more likely to develop long-term neurological and developmental disabilities, in comparison with full-term infants. Few studies focused on health-related quality of life (HRQOL) as an outcome among mothers with prematurity but the results were not consistent. However, these studies have focused on high-risk births of very preterm infants born before 32 weeks, who often present more medical complications and physiological immaturity. The goal of our study was to determine the effect of LPIs on maternal HRQOL at 6, 18 and 36 months after birth.

PATIENTS AND METHODS

The mother and infant were chosen via a stratified sampling from Taiwan national birth registration database in 2005. Between June 2005 and December 2007, structured home interviews were conducted with 24,200 women at 6, 18, and 36 months after childbirth. As a result, the following data analysis was based on a total of 13,077 pairs of mother and infant who were included in this study. Infants were characterized as either late preterm ($34^{0/7}$-$36^{6/7}$ weeks of completed gestation) or term (after $37^{0/7}$

weeks of completed gestation). A total 730 (5.6%) late preterm infants and 13,077 (94.4%) term infants were enrolled in our study. We used the Medical Outcomes Study 36-item Short-Form (SF-36) to measure maternal HRQOL (**Tab. 1**).

Table 1 (ABS 5). Characteristics of subjects based on Chi-square test.

	Late preterm	Non-late preterm	p-value
Total, n (%)	730 (5.6)	13,077 (94.4)	
Maternal age, %			
< 30 years	52.5	56.8	0.022
≥ 30 years	47.5	43.2	
Maternal educational level, %			
Junior high school or below	9.9	6.5	< 0.0001
Senior high school	46.4	41.1	
University or above	43.7	52.4	
Family income per month, %			
< 50,000 NT$	39.2	34.5	0.1888
50,000-69,999 NT$	25.6	30.0	
70,000-99,999 NT$	20.4	24.6	
≥ 100,000 NT$	14.8	12.9	
Marital status, %			
Married	90.9	92.2	0.2293
Divorced/unmarried	9.1	7.8	
Infant gender, %			
Male	56.7	51.2	0.0036
Female	43.3	43.8	
Family size at 6 months, %			
1	41.9	50.9	< 0.0001
2	39.2	38.3	
≥ 3	18.9	10.8	
Family size at 18 months, %			
1	39.7	48.1	< 0.0001
2	38.9	40.0	
≥ 3	21.4	12.0	
Family size at 36 months, %			
1	33.4	38.6	< 0.0001
2	38.8	40.9	
≥ 3	27.8	20.5	
Hospitalization after birth, %			
0	80.9	88.6	< 0.0001
1	13.6	10.1	
≥ 2	3.5	1.3	
Hospitalization 6-18 months, %			
0	80.4	83.2	0.0765
1	15.8	13.4	
≥ 2	3.8	3.4	
Hospitalization at 2-3 years, %			
0	85.9	87.5	0.1197
1	11.4	10.6	
≥ 2	2.7	1.9	

RESULTS

Our study showed negative effect of LPIs on maternal quality of life at 6 and 18 months after birth. The differences among three out of the eight domains at 6 months were statistically significant (p < 0.05) including physical functioning, role limitation due to emotional problems and mental health. The differences among two out of the eight domains at 18 months were statistically significant (p < 0.05) including general health perception and mental health. Physical and mental component summary were significant different among these two groups of mothers (p < 0.05) at 6 and 18 months. The difference with regards to maternal HQROL between LPIs and full-term infant was disappeared at 36 months after birth (**Tab. 2** and **Tab. 3**).

CONCLUSIONS

In our knowledge, this is the first study to primarily explore the longitudinal change in the HRQOL experienced over time by mother with LPIs. In our study, being a mother of LPIs decreased the health-related quality of life included physical and mental domains as compared to those of full-term infants at 6 and 18 months of age.

Table 2 (ABS 5). Maternal SF-36 scores of study subjects at 6, 18 and 36 months after childbirth.

	Maternal SF-36 scores at 6 months after childbirth Mean ± SE			Maternal SF-36 scores at 18 months after childbirth Mean ± SE			Maternal SF-36 scores at 36 months after childbirth Mean ± SE		
	Late preterm (730)	Non-late preterm (12,347)	p-value	Late preterm (730)	Non-late preterm (12,347)	p-value	Late preterm (730)	Non-late preterm (12,347)	p-value
PF	**97.21 ± 6.55**	**97.68 ± 6.01**	**0.0411**	96.74 ± 7.60	96.60 ± 8.50	0.6552	97.75 ± 6.77	97.37 ± 7.41	0.1834
RP	90.21 ± 24.81	91.77 ± 22.80	0.0742	88.01 ± 28.48	89.74 ± 25.87	0.0815	90.99 ± 23.97	90.27 ± 25.34	0.4520
BP	85.88 ± 17.29	85.50 ± 16.56	0.3241	85.66 ± 17.95	86.66 ± 16.99	0.1154	85.30 ± 18.33	85.29 ± 18.42	0.9841
GH	75.53 ± 18.71	76.73 ± 17.93	0.0782	**73.25 ± 20.36**	**75.97 ± 18.56**	**0.0001**	75.73 ± 18.19	75.79 ± 18.62	0.9390
VT	61.29 ± 18.74	61.96 ± 17.40	0.3190	61.17 ± 18.24	62.37 ± 17.31	0.0709	62.44 ± 16.71	63.11 ± 16.69	0.2906
SF	87.69 ± 15.96	88.41 ± 14.96	0.1539	87.74 ± 16.34	88.70 ± 15.12	0.0957	89.20 ± 14.28	88.68 ± 14.74	0.3566
RE	**78.77 ± 35.97**	**82.22 ± 32.86**	**0.0061**	81.28 ± 33.49	83.38 ± 31.91	0.0854	83.97 ± 31.63	84.47 ± 31.10	0.6724
MH	**68.49 ± 17.59**	**70.39 ± 19.91**	**0.0018**	**69.30 ± 16.89**	**70.59 ± 16.06**	**0.0356**	68.48 ± 15.87	68.70 ± 15.58	0.7081

PF: physical functioning; RP: role limitation due to physical problems; BP: pain; GH: general health perception; VT: energy vitality; SF: social functioning; RE: role limitation due to emotional problems; MH: mental health.

Table 3 (ABS 5). Maternal SF-36 scores of study subjects at 6, 18 and 36 months after childbirth, adjusted for confounding factors.

	Maternal SF-36 scores at 6 months after childbirth Mean ± SE			Maternal SF-36 scores at 18 months after childbirth Mean ± SE			Maternal SF-36 scores at 36 months after childbirth Mean ± SE		
	Late preterm (730)	Non-late preterm (12,347)	p-value	Late preterm (730)	Non-late preterm (12,347)	p-value	Late preterm (730)	Non-late preterm (12,347)	p-value
PF	**96.53 ± 0.27**	**96.91 ± 0.18**	**0.0448**	96.67 ± 0.35	96.71 ± 0.18	0.6785	97.59 ± 0.32	97.25 ± 0.19	0.1969
RP	88.15 ± 1.03	89.43 ± 0.67	0.0629	89.59 ± 1.07	88.38 ± 0.56	0.0712	89.04 ± 1.10	88.29 ± 0.64	0.4799
BP	84.48 ± 0.74	84.80 ± 0.48	0.3285	83.80 ± 0.70	84.55 ± 0.36	0.1154	84.12 ± 0.80	84.16 ± 0.47	0.9264
GH	73.15 ± 0.80	73.89 ± 0.52	0.0768	**70.66 ± 0.77**	**72.95 ± 0.40**	**0.0001**	73.91 ± 0.81	73.99 ± 0.47	0.8782
VT	59.89 ± 0.78	60.38 ± 0.51	0.3054	59.49 ± 0.72	60.54 ± 0.37	0.0067	61.23 ± 0.73	61.83 ± 0.42	0.2969
SF	86.04 ± 0.67	86.81 ± 0.44	0.1282	86.43 ± 0.63	87.44 ± 0.32	0.1017	88.03 ± 0.64	87.48 ± 0.37	0.4124
RE	**76.98 ± 1.48**	**80.20 ± 0.96**	**0.0047**	79.11 ± 1.32	80.89 ± 0.68	0.0759	82.52 ± 1.35	83.05 ± 0.79	0.6164
MH	**66.60 ± 0.72**	**68.19 ± 0.46**	**0.0020**	**67.08 ± 0.66**	**68.04 ± 0.34**	**0.0357**	67.80 ± 0.68	67.96 ± 0.40	0.6894

PF: physical functioning; RP: role limitation due to physical problems; BP: pain; GH: general health perception; VT: energy vitality; SF: social functioning; RE: role limitation due to emotional problems; MH: mental health.
We considered potential confounders for quality of life including maternal age, education, family income per month, infant sex, parity, family size and child health.

Medical Education and Training

ABS 6

RELATIONSHIP BETWEEN ANXIETY LEVELS AND CLINICAL PRACTICE SKILLS AMONG STUDENTS OF PEDIATRIC NURSING LECTURE

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OBJECTIVE
To determine Students' anxiety levels and factors that increases the level of anxiety.

PATIENTS AND METHODS
This descriptive-relational study was administered to students taking the lecture pediatric nursing in the academic year 2013-2014. A total of 115 students were reached without sample selection. Data were collected through using a questionnaire developed by the researchers on the basis of published literature and "State-Trait Anxiety Inventory". Data were performed by computer and chi-square, t test and variance analyses were used in the evaluation of the data. Significance value of $p < 0.05$ was considered.

RESULTS
Most of students (78.3%) had moderate school success. They didn't receive simulation training (70.4%) before. Almost half of them felt adequate for interventions. Mean scores of state anxiety were 43.77 ± 10.18; average trait anxiety scores were 46.55 ± 8.20. According to trait anxiety scores, 38.3% of students face no anxiety but the rest of them identified mild (57.4%) and severe (4.3%) anxiety. According to trait anxiety scores of students, 21.7% of them didn't have anxiety but the rest of them identified mild (73.0%) and severe (5.2%) anxiety. State anxiety scores averages about feeling inadequacy in receiving child's chest ($p = 0.043$) and abdominal circumferences ($p = 0.018$), ID drug application ($p = 0.036$) were found higher than students' trait anxiety scores averages about feeling inadequacy in SC drug application and ($p = 0.043$), making appropriate vibration movement ($p = 0.021$).

CONCLUSIONS
It was found that most of students were living with mild or severe state and trait anxiety. Demographic characteristics of students did not affect the level of anxiety but it was identified that students felt themselves inadequate to be effective in the nursing interventions.

ABS 7

ACCURACY OF SMARTPHONES FOR REVIEWING TRANSMITTED IMAGES OF NEONATAL X-RAYS

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INTRODUCTION
Neonatologists may be asked to advise clinicians managing newborns at other locations, including interpreting neonatal X-ray images. Digital X-ray transmission may not be available and anecdotally photographs of X-ray images are sometimes transmitted via smartphone multimedia messaging (MMS). There is little evidence to demonstrate whether smartphones have sufficient image resolution to enable clinicians to correctly identify important neonatal conditions. This study aimed to compare the accuracy of pneumothorax diagnosis using neonatal chest x-ray (CXR) images viewed using specialised digital imaging software, with photographed images transmitted to, and viewed on smartphones.

PATIENTS AND METHODS
Twenty anterior-posterior neonatal CXR images demonstrating pneumothoraces, and 20 images of other common neonatal pathologies were selected from an Australian tertiary level hospital database. All images were anonymised. Smartphone photographs of the images displayed on a computer screen were transmitted to another smartphone via MMS. 21 neonatal clinicians (12 consultants, 9 fellows) reviewed all 40 images in random order, on 2 occasions: once on a computer screen using standard imaging software

(Synapse®, v. 4.1, Fujifilm Corp), and once on a smartphone (iPhone® 5, Apple Inc). Participants were given relevant clinical details and asked if a pneumothorax was present. The sensitivity, specificity and accuracy of each method relative to the gold standard radiologist report were calculated.

RESULTS

Eight hundred and forty reports were analysed. 80.1% of pneumothoraces were correctly identified using Synapse® software, vs. 81.4% using the smartphone (p = 0.50). The sensitivity, specificity and accuracy of the devices compared with the gold standard are presented in **Tab. 1**. The diagnostic accuracy was not significantly different between consultants (smartphone 81.6%, computer 80.3%) and fellows (smartphone 80.6%, computer 78.6%). The inter-rater reliability was moderate (kappa value 0.67). All pneumothoraces which required clinical intervention were identified by all participants using both viewing methods. The same images were incorrectly diagnosed, with respect to the gold standard, with both devices.

Table 1 (ABS 7). Sensitivity, specificity and accuracy of the devices compared with the gold standard.

Device	Sensitivity (%)	Specificity (%)	Accuracy (%)
Smartphone	78.6	84.3	81.4
Computer	71.7	88.6	80.1

CONCLUSIONS

Making a diagnosis of pneumothorax using a smartphone was as accurate as that using specialised imaging software. This method of reviewing neonatal X-ray images for the presence of a pneumothorax may be useful where on-site expertise is limited.

ABS 8

PERCEPTION OF NEONATAL SIMULATION AMONGST DIFFERENT PROFESSIONALS IN A LEVEL 3 NEONATAL UNIT: A 2-YEAR EXPERIENCE IN LUTON AND DUNSTABLE

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INTRODUCTION

There is a growing appetite for simulation based training to enhance patient safety and effective team working in all areas of paediatrics. A programme of point of care simulation training was established at the Luton and Dunstable Hospital neonatal intensive care unit (NICU) since 2011. The team expressed anxiety prior to training sessions and was positive at its conclusion. However the perception of benefit, if any, could not be ascertained. This study was carried out to determine whether neonatal simulation is perceived as beneficial in improving clinical competency and if neonatal professionals thought it should be a compulsory inclusion to the training curriculum.

PATIENTS AND METHODS

The survey was carried out in a single NICU, using questionnaires distributed to the neonatal team. The questionnaire explored the following areas: a) whether the simulation experience was perceived as realistic, b) which aspects of patient care and skills were addressed by the training sessions, c) the usefulness of simulation as a learning tool, d) whether simulation training should be made a compulsory part of training for doctors and nurses. The survey was prospectively carried out over a 6-month period between March-September 2014.

RESULTS

There were 46 responses: 5 specialty doctors ST1-ST3 grade, 5 ST4-ST8 grade, 6 consultants, 1 student, 28 neonatal nurses and 1 respondent didn't specify their grade. 86.9% found the mannequins realistic and 67% were able to suspend disbelief well. Whilst 50% said the presence of instructors didn't affect their performance, 39% felt that their experience was negatively influenced by the presence of the instructors. 93.4% felt simulation improved their clinical skills. 13% had experienced a similar clinical event before simulation training and agreed that the training made them now more confident. 69% believed simulation addressed all aspects of patient care namely patient safety, practical and technical skills, teamwork, leadership skills and communication skills. 91.3% agreed that simulation was a useful learning tool and 56% felt simulation should be a compulsory part of the training curricula.

CONCLUSIONS

Despite concerns that mannequins may not be sufficiently realistic, results indicate that simulation can be a useful tool in improving all aspects of patient care. It provides training in real life scenarios and improves clinical skills. Recording simulation events may eliminate the need for

instructors' presence. In spite of reservations from staff, simulation training was received positively with more than half of the respondents calling for it to be integrated into regular mandatory training.

ABS 9

SUCCESS IN NEONATAL SKILLS & SCENARIO TEACHING IN NORTHERN IRELAND

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INTRODUCTION

There has been recent increased use of high fidelity mannequin simulation training in clinical practice.

At present, paediatric trainees in Northern Ireland undergo two core placements in neonatology but otherwise may have limited exposure. The Newborn Life Support course is mandatory but studies have shown that, without continuing exposure, resuscitation skills can deteriorate over time.

A programme of two hour neonatal skills workshops, including high fidelity simulation training and procedural teaching, was introduced to paediatric medical staff at a district general hospital in Northern Ireland with a reported rise in confidence levels in core neonatal resuscitation skills.

PATIENTS AND METHODS

A literature review shows that high fidelity mannequin simulation teaching is universally well received and delivers more effective learning. To help improve trainee exposure and comfort levels with neonatal resuscitation, monthly workshops were run by two registrars and a consultant.

Small group simulation training was delivered via a high fidelity SimBaby™ and facilitated by a registrar or consultant. The scenarios included common problems such as meconium aspiration, pneumothorax or preterm delivery. Immediate feedback was offered by the group observing and the facilitator. Skills teaching was delivered via low fidelity dummies separately and then as part of extended scenarios, including endotracheal intubation, umbilical access (using human tissue samples) and chest drain insertion.

RESULTS

Trainees with a range of prior experience in neonatal resuscitation were asked to complete a self-assessment questionnaire before and after one of the workshops (**Fig. 1**). This comprised of a confidence scoring system on skills essential in neonatal resuscitation including airway manoeuvres, endotracheal intubation, chest compressions and umbilical access. Senior house officers were more comfortable with airway support and bag mask ventilation. Registrars were more comfortable with practical procedures and leading the team. All trainees reported an
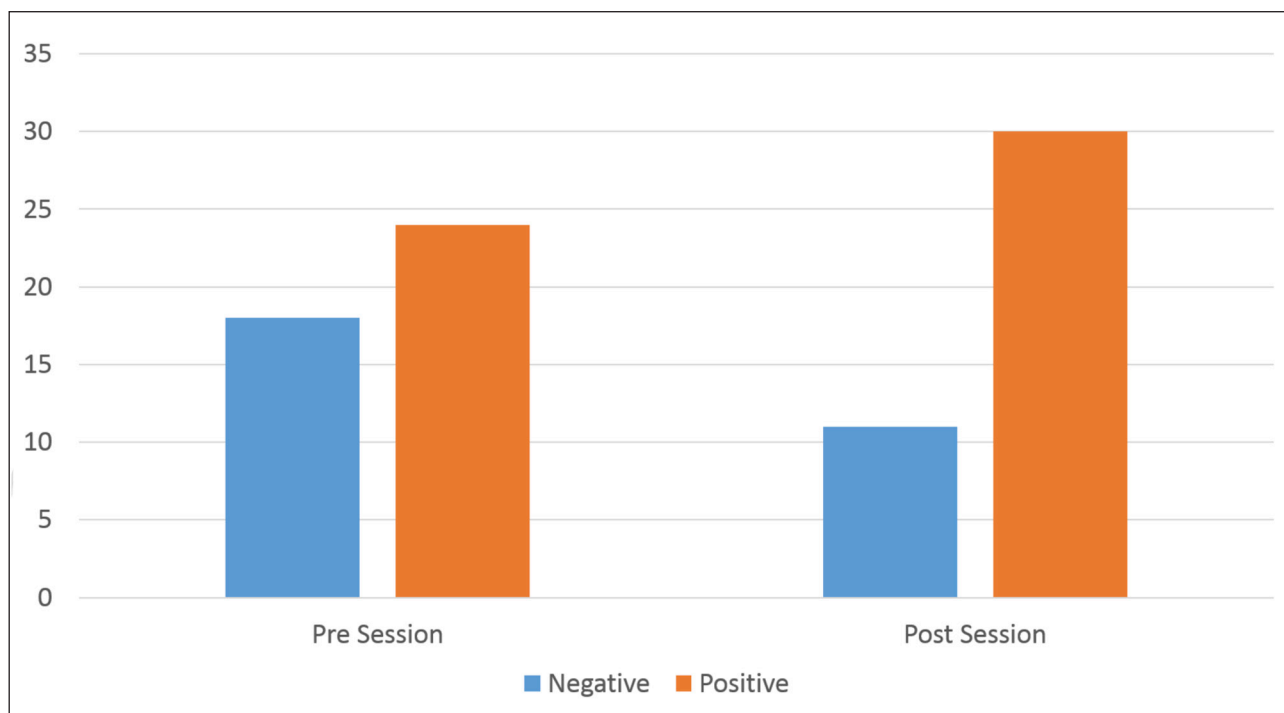

Figure 1 (ABS 9). Confidence level in trainees during neonatal skills scenarios.

increase in their confidence with all skills following the session, most so with endotracheal intubation. The trainees were also offered an opportunity to provide feedback via free text. This was used overwhelmingly to request a longer session.

CONCLUSIONS

High fidelity simulation training has been shown to improve confidence levels of all levels of trainees working in a busy district general hospital. Further workshops are planned to continue this successful training and will expand into paediatric emergency scenarios. An audit into outcomes in actual practice following the introduction of these sessions should be carried out to ensure an improvement in care delivered.

ABS 10

STRATEGIES FOR EFFECTIVE LEARNING AT THE INAUGURAL NEONATAL CRANIAL ULTRASOUND WORKSHOP

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INTRODUCTION

Cranial ultrasound remains the mainstay of brain imaging in neonatology. However, acquisition of skills in performing these in Singapore are limited by lack of a formal training program. Hence a one-day introductory workshop on neonatal cranial ultrasound was organized. The audience comprised of Paediatricians and Sonographers in addition to trainees in Radiology and Paediatrics.

PATIENTS AND METHODS

Course didactic lectures covered neonatal brain anatomy, scanning techniques and diagnosis of common conditions including intra-ventricular hemorrhage, ischemic injury, congenital abnormalities and fetal infections. Teaching faculty comprised pediatric radiologists, neonatologists and sonographers. The course was structured to include live demonstration of standard ultrasound views, group tutorials focused on scanning, scenario teaching using simulated role-playing and literature review regarding prognostication of abnormal scans. Participant assessment was gauged from an electronic audience response system to multiple-choice questions (MCQs). Feedback was collected regarding course organization, lecture content and suggestions for future courses.

RESULTS

A total of 49 participants including 11 sonographers, 18 medical officers/residents, 16 registrars/senior residents and 4 consultants/senior consultants attended the workshop (**Fig. 1**). Teaching methods were as above. Workshop feedback was obtained from 43 (87%) participants. Lectures were rated good to excellent by a majority. All participants regardless of specialty or seniority felt that the combination of hands-on teaching and audience interaction in conjunction with didactic lectures (p = n.s.) were beneficial to their learning. 93% of participants agreed that role playing was an appropriate teaching method for imparting communication skills and there were no differences in the mean MCQ scores between sonographers and doctors (p = 0.055).

Figure 1 (ABS 10). Participants who attended the workshop.

CONCLUSIONS

The inaugural cranial ultrasound workshop was highly successful in introducing participants to basic knowledge and skills for acquiring and interpreting scans. Appraisal of evidence regarding clinical outcomes and scenario teaching was beneficial for future counseling of parents. Participants felt that a regularly conducted workshop and emphasis on more advanced scanning techniques for experienced users would further enhance the effectiveness of future workshops.

ABS 11

FIRST DAYS IN NICU – ARE GRADUATES WELL PREPARED FOR WORK?

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INTRODUCTION

Preterm birth is a very difficult medical and psychological situation both for the babies and their parents, so we have to take holistic and interdisciplinary care of them. Our team comprises a lot of people: medical staff from maternity wards, neonatologists, paediatricians, specialists in various fields of medicine, nurses and midwives, physiotherapists, psychologists and social workers as well as family.

The aim of the study was to assess physiotherapy, nursing and midwifery students' knowledge on the program of early stimulation and developmental care of the newborn; and to compare the level of their knowledge depending on the university and field of study.

PATIENTS AND METHODS

The study was conducted in May and June 2014. The study group consisted of 351 students in the third year of undergraduate studies in physiotherapy, nursing and midwifery from three universities: the Jagiellonian University Medical College in Krakow, the University of Physical Education in Krakow and the State Higher Vocational School in Tarnow. Students participating in the course of study were divided into five groups according to the university and area of study. The research tool was the author's questionnaire survey. Students participating in the study were informed that the survey was anonymous and that the resulting data would be kept confidential and used only for research purposes. The study took place at the end of theoretical and practical course in neonatology and paediatrics.

RESULTS

Midwifery students' knowledge was higher than the competence of nursing and physiotherapy students', which is probably related to the syllabus in midwifery which includes theoretical and practical subject – neonatology and neonatal care. Physiotherapy students were from two different universities. Their knowledge did not differ despite the fact that the research hypothesis assumed that students from one university have higher knowledge due to taking part in practical training

at neonatal intensive care unit. Nursing students were also from two different universities. Students from one university have higher knowledge. These differences make us compare syllabuses and skills of lecturers at different universities. Students' knowledge depends on the interest in working at neonatal or paediatric ward.

CONCLUSIONS

1. Midwifery students' knowledge was higher than other students' knowledge.
2. There are differences in knowledge and skills of students from different universities.
3. Students' knowledge depends on the interest in working with children.
4. In the future it would be interesting to continue research on medical students' knowledge and the problems doctors encounter during speciality training in neonatology or paediatrics.

ABS 12

A TWO SECOND VISUAL METRONOME IMPROVES CARDIAC COMPRESSIONS DURING NEWBORN RESUSCITATION SIMULATION

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INTRODUCTION

Approximately 1% of newborns, mostly premature infants, require cardiac compressions (CC) (Perlman, 1995). During CCs, complete compression and release are important to achieve adequate coronary blood flow. In adults, effective CCs lead to improved outcomes (Gallagher, 1995). However, only 38% of CCs during newborn simulations are of satisfactory quality (Antonius, 2012). CC rate should be at a ratio of 3 CC to 1 breath every 2 seconds achieving 90 CC/min. CC rate is very variable and with increasing rate above 90 there is a decrease in CC quality (Tan, 2014).

AIM

Does a 2 second (2-s) visual interval timer improve CC rate and quality during simulated newborn resuscitation?

PATIENTS AND METHODS

Using a 2-s visual timer, newborn resuscitation trained staff used the Life/form® preterm (~25 week gestation) and Laerdal Resusci® Baby manikins to

perform two thumb (TT) and two finger (TF) CCs, with randomisation of technique and manikin. The timer comprised a 2-s flashing 'breath' screen on an Android tablet. Rate, depth of CC and extent of release were measured using a custom calibrated Tekscan FlexiForce sensor (standard error ± 3%). Sufficient CC was defined as compression > 1/3 of the chest AP diameter and sufficient release as > 3/4 release of the compression distance. CC rate and quality were compared with our previous study which was identical except for the 2-s timer (Tan 2014). Mann-Whitney and Chi squared statistics were used with p < 0.05. Ethical approval was given.

RESULTS

27 participants each performed 4 one minute long rounds of CPR (TT and TF techniques on preterm and term manikins, total CCs = 9,203) during this phase of the study. Using the 2-s timer the median CC rate was reduced from 93.5/min (no timer, IQR 85-112) to 91/min (IQR 90-92) (p < 0.05, **Fig. 1**). The overall number of effective compressions increased with timer use (59% to 69%, p < 0.0001) whilst the percentage of CCs with insufficient release was similar (6% no timer vs. 7% with timer, n.s.).

CONCLUSIONS

Use of a 2-s interval timer during neonatal resuscitation simulations increases adherence to newborn resuscitation guidelines in terms of improved CC rate and depth. The rate of CCs using the timer was significantly better with markedly less variability despite no prior training using the timer. In clinical practice increased adherence to CPR recommendations would lead to increased coronary blood flow and improved resuscitation outcomes.

ABS 13

A NEW SURVEY IN NEONATAL RESUSCITATION IN SPAIN

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INTRODUCTION

In 2009, the Neonatal Resuscitation Group (NRG) of the Spanish Society of Neonatology reported the results of a survey in neonatal resuscitation. It's aim was to audit adherence to guidelines, regarding equipment and practices. We reported some gaps between knowledge and practice. After the publication of 2010 guidelines which highlighted the importance of education, the NRG training program focussed in covering the spectrum of all hospitals looking for an improvement in all levels of care. In 2012, we launched a new survey which aimed to evaluate the progress in implementing recommended equipment and practices in the delivery room (DR).

PATIENTS AND METHODS

In the last trimester of 2012, a questionnaire was e-mailed to all hospitals attending deliveries in Spain. It was a 48-question document which explored different areas related to DR resuscitation: demographics, ethics (threshold of viability and resuscitation, redirection of care), equipment, staff availability and training, clinical practices during resuscitation and post-resuscitation management. Descriptive statistics were used to analyse the results. In order to evaluate changes in clinical practice in 5 years, results from hospitals that participated in both surveys were compared. A total of 180 questionnaires were sent, 155 of which were fully completed. 98 centres had completed the survey in both years and were all suitable for comparative analysis.

RESULTS

From 2007 to 2012, no differences were found in hospital level, number of deliveries or number of very preterm infants per year. Most centers offered resuscitation from 24 weeks gestation and
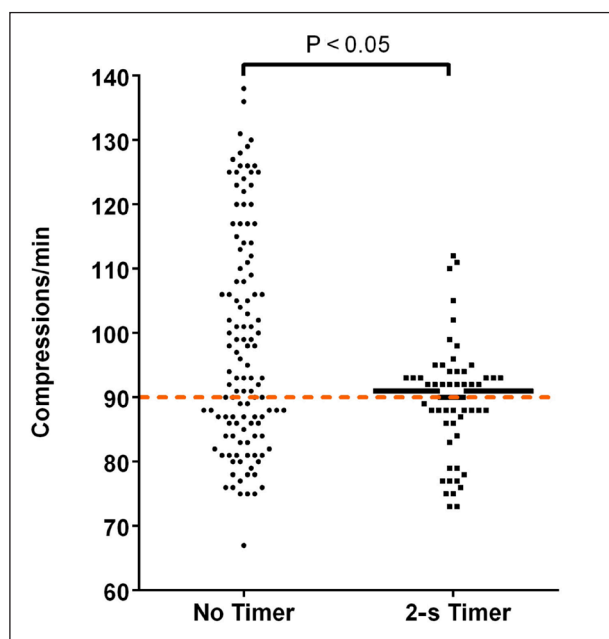

Figure 1 (ABS 12). Cardiac compressions (CC) rate without timer and with 2-s timer.

some did at 23 weeks. There was an increasing involvement of neonatologists and a decreasing involvement of anaesthesiologists in non-tertiary centres. Training improved over time. There was an increase in the use of polyethylene bags; however, a decrease in achieving a temperature of 26ºC in the DR was reported. In the event of a suspected hypoxic-ischemic encephalopathy, most centres started cooling in the DR. The use of O_2 blenders and FiO_2 targeting guided by pulse oximetry significantly increased whilst colour assessment decreased. The use of self-inflating bags decreased whereas controlled PIP and PEEP via T-piece increased, especially in preterm infants. N-CPAP use also increased in preterm infants.

CONCLUSIONS

1. Equipment in the DR has frankly improved regardless the level of care of the centers.
2. There are some actions that can be improved in order to reach a greater adherence to guidelines, specially plastic wrap for heat loss, pulse oximeter monitoring and CPAP for preterm respiratory stabilization.
3. We think that the better results of 2012 are due to the proactive policy of neonatal resuscitation started in 2007.
4. We have to carry on with this educational policy.

ABS 14

UMBILICAL ARTERY INSERTION IN NEWBORN INFANTS: ACCURACY OF 11 AVAILABLE FORMULAE TO GUIDE CATHETER TIP PLACEMENT

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INTRODUCTION

Umbilical arterial catheter (UAC) insertion is a common procedure in the NICU. It is important to place the tip of the UAC correctly at first attempt to minimise handling of the unstable infant, prevent complications and reduce risk of infection. Eleven formulae to determine the optimal length of UAC insertion have been published (**Tab. 1**). Three of these formulae use weights (F5, F7, F8), 8 use measurements of body dimensions (F1, F2, F3, F4, F6, F9, F10, F11). F10 also includes weight in the calculation. F3 (the RWH protocol) uses measurement of distance from the umbilicus to the acromio-clavicular joint. We aimed to determine the accuracy of the 11 formulae to guide UAC placement.

PATIENTS AND METHODS

This is a prospective, observational study. Infants admitted to the Royal Women's Hospital (RWH) NICU requiring UAC insertion were recruited from August 2014 till March 2015. Clinicians used any formula for UAC tip placement. Immediately after UAC insertion, an X-ray was performed; weight and measurements needed to apply the 11 formulae were recorded within 48 hours. Using x-rays, we determined the "gold standard" distance

Table 1 (ABS 14). Umbilical artery catheter insertion in newborn infants: accuracy of 11 available formulae to guide catheter tip placement.

Formulae	Mean difference from T8 (cm)	Limits of agreement (cm)	Anticipated success rate (%) (CI)
F1. Sritipsukho, 2007	-0.09	-3.67, 3.50	73 (62-82)
F2. Weaver & Ahlgren, 1971	0.03	-2.18, 2.23	72 (61-82)
F3. RWH Protocol	0.14	-2.29, 2.57	72 (61-82)
F4. Rosenfeld, 1980	0.25	-2.34, 2.84	68 (57-78)
F5. Shukla & Ferrara, 1986	-0.96	-3.22, 1.30	58 (46-69)
F6. Dunn, 1966	0.53	-2.64, 3.70	57 (45-68)
F7. Lin, 1989	1.29	-1.92, 4.50	56 (44-67)
F8. Wright, 2008	-0.48	-4.53, 3.57	54 (43-66)
F9. Rubin, 1986	1.16	-2.81, 5.12	53 (41-64)
F10. Pollack & Roloff, 1981	-0.35	-3.64, 2.93	49 (38-61)
F11. Vali, 2010	0.88	-2.96, 4.72	48 (37-60)

(introduction length from abdominal surface to reach T8 position, range T6-T10) for each patient. We calculated introduction lengths using the 11 formulae and compared them to the gold standard (Bland-Altman method).

RESULTS

Seventy-nine infants who had UAC inserted and their measurements recorded within 48 hours of the procedure were included in the study. Their median (IQR) gestational age was 27 (26-33) weeks, and median (IQR) weight was 950 (750-2,045) g. Mean difference from T8 position, limits of agreement and anticipated success rate (T6-T10) calculated by each formula are shown in **Tab. 1**.

CONCLUSIONS

Formulae that involve direct body part measurements rather than only body weight (F1, F2, F3) showed the highest success rates and lowest mean differences when compared with gold standard. Even the most accurate method would result in more than 25% of UACs needing manipulation to achieve a safe position.

ABS 15

THE INTEGRATION OF EFFECTIVE PERINATAL AND NEONATAL CARE IN KYRGYZSTAN

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INTRODUCTION

Kyrgyzstan is a country with a population of 5 million 776,900 people with fertility rate of 27.2 per 1,000 population, and with an overall mortality of 6.0 per 10,000 population. The population of the Kyrgyzstan is young demographically: children and adolescents account for 32.3% from the total number; women 50.4% (of them, women of reproductive age are 54.8%).

In recent years, the fertility rate of women has increased from 2.38 in 2001 to 3.1 in 2010. We still have a tendency to increase rates of natural growth 20.2 per 1,000 of population.

Kyrgyzstan integrates services to improve maternal and child health on track to achieve the Millennium Development Goals in 2015 (MDG4, MDG5).

PATIENTS AND METHODS

In 2004, Kyrgyzstan introduced the live birth criteria, recommended by WHO, after the implementation of which, there was an expected increase in infant mortality in the country from 20.9 in 2004 to 30.4 (2008).

Since 2004, the country's integrated a program of maternal and neonatal care, based on evidence. Over the past 10 years there has been a downward trend in perinatal mortality.

The main place in the structure of causes of infant mortality is occupied by conditions originating in the perinatal period (63.1%).

For improving the quality of medical services to mother in labor and newborn child, the program of the perinatal care from 2008 to 2017 was accepted.

RESULTS

- More than 50% of all deliveries take place in health facilities with the title "The hospital child-friendly".
- Reviewed and approved clinical protocols in obstetrics and neonatology, clinical guidelines and CD-ROMs on Effective Perinatal Care.
- Introduced programs to register newborns, according to the researchs of critical cases and confidentially parsing maternal mortality.
- Introduced training programs for maternal and child health at the Institute of postgraduate training, integration services for health promotion in primary health care.
- Raising the awareness of medical staff and the public through the Cabinet of Health Promotion and Village Health Committee.
- Over the past 10 years, rates of perinatal mortality in 2013 was 22%, neonatal mortality 15.9%, infant mortality 19.9%.

CONCLUSIONS

The goal of the perinatal program: to increase the capacity of health systems to provide timely and effective assistance to pregnant women, women in labor and newborns, with the guarantee of equal opportunities for quality care in all regions of the country. Regionalization-reorganization of perinatal/neonatal is improving care through the introduction of phasing services principle.

Effective Perinatal Care is integrated into more than 70% of maternity clinics and continues to introduce over the country.

ABS 16

NEONATAL VIDEOLARYNGOSCOPY AS A TEACHING AID – THE TRAINEES' PERSPECTIVE

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INTRODUCTION

Neonatal endotracheal intubation is a mandatory but difficult skill to acquire. Most commonly, an apprenticeship model is used whereby a senior clinician stands alongside the trainee and oversees the intubation. However, the instructor has a limited view of the procedure. Videolaryngoscopy enhances the learning experience by providing the instructor an unrestricted shared view to guide the trainee. We surveyed trainees participating in a randomised trial of videolaryngoscopy assisted neonatal intubation.

PATIENTS AND METHODS

An unblinded randomised, controlled trial (ANZCTR number 12613000159752) compared neonatal intubations guided by an instructor watching images on a videolaryngoscope screen with the traditional method where the instructor does not have this view. Eligible intubations were those performed on infants in the delivery room or in the neonatal intensive care unit, by trainees with less than six months of tertiary neonatal experience. The instructors were 2 consultants and 4 senior fellows. Guidance provided by the instructor was standardised. A minimum group of 4 people were present during the intervention. Residents completed a validated questionnaire within 48 hours after each intubation attempt. They were asked to assess the guidance they received using Likert responses and free text.

RESULTS

Questionnaires were completed following all 206 intubation attempts (100% response rate). 92% reported that the guidance they received was helpful. 88% felt it helped them achieve a better view. 93% found the feedback they were given to be helpful and 92% felt it improved their confidence for future attempts. Responses were more positive if the intubation attempt was successful. Responses from trainees in the two randomised groups were not significantly different. 16% found the experience intimidating. The intubations reported most frequently as "intimidating" were those without premedication and without the instructor sharing their view. Thematic analysis of the comments showed that trainees appreciated a controlled, supportive environment, time to prepare and calm, clear, consistent guidance. They found intubations in the delivery room, audiences and parental presence more stressful.

CONCLUSIONS

Learning to intubate is stressful. Controlling the setting and the manner in which guidance is offered may reduce the trainee's anxiety and promote a positive learning environment.

ABS 17

STANDARDIZED PROCEDURAL SKILLS TRAINING WITH A DOCUMENTED LEARNING OUTCOME

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INTRODUCTION

Procedural skills are an important part of pediatric training essential to patient safety. Video and patient simulators are useful learning aids, but for many core skills teaching in a live model is the only alternative to clinical learning. Many residents fail to obtain important practical clinical skills and there has been a call for more standardized methods of teaching. We hypothesized that structured training may facilitate the learning of procedural skills and that an animal model can be used for standardized training. We aimed to create a standardized course teaching core procedural skills with a documented learning outcome curse using a newborn piglet model.

PATIENTS AND METHODS

We developed a one-day pediatric and neonatal procedural skills training course for pediatric trainees. The course consists of 4 modules. Each module involves an initial 30 min theoretical session, a practical clinical skills workstation, evaluation and self-assessment; pre- and post course multiple choice questions (MCQ). Module 1: invasive procedures (umbilical lines, PICC lines, lumbar puncture, chest tube, bladder puncture). Module 2: ultrasound procedures (catheter placement, i.v. cannulation, pleural scan,

functional echo). Module 3: airway and ventilator skills (endotracheal intubation, mechanical ventilation). Module 4: neuromonitoring (aEEG). The animal protocol is approved by the Danish committee for animal experiments (2013-15-2934-00881).

RESULTS

We have completed 4 course days with a total of 32 participants. Data from the first 16 participants is presented. Test results between pre- and post course MCQ improved by 22%, with highest improvement rates for very junior and most senior pediatric trainees. Self-rating of perceived competency pre- and post course on a 10-point scale was on average improved by 31% with a 60% improvement for the most junior doctors. For PICC line placement an average 88% improvement in self-rating was seen, junior doctors improving more than 100% (e.g. self-rating improved from 2 to 5) for PICC lines, umbilical arterial catheter placement, chest tube insertion, endotracheal tube placement, aEEG and mechanical ventilation.

CONCLUSIONS

We have established a procedural skills training course, that provides a successful learning environment with improved MCQ score and improved self-rating. This is consistent with the successful use of animal models in surgical training. We further plan to evaluate the retention of the learning and maintenance of skills and to survey the current training opportunities for pediatric residents/registrars in Denmark.

ABS 18

ACCURACY OF METHODS TO ESTIMATE THE INSERTION LENGTH OF UMBILICAL VENOUS CATHETERS IN NEWBORN INFANTS

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INTRODUCTION

Umbilical venous catheter (UVC) placement is a common procedure in the NICU, and is used mainly for infusion of fluid, parenteral nutrition and medications. It is important to position the UVC tip appropriately to prevent complications and minimise handling of the newborn. Five methods of estimating UVC insertion length have been described, but it is unclear which is the most accurate. Three of these formulae use body dimension measurement with F1 (the RWH protocol) using the distance from umbilicus to xiphisternum plus 1 cm; whereas 2 of the formulae use weight. We aimed to compare the accuracy of these 5 methods, using the position on X-ray as the gold standard.

PATIENTS AND METHODS

This is a prospective observational study. Infants admitted to the Royal Women's Hospital (RWH), who had UVC inserted were recruited from August 2014 to March 2015. Clinicians inserted the UVC according to local guidelines. Immediately after UVC insertion, an X-ray was performed to confirm tip position. Body measurements and weight used in the published formulae were recorded within 48 hours. The actual location of the UVC tip was used to derive the ideal distance from the abdominal wall to the gold standard position (at diaphragm level on lateral X-ray, range 0-1 cm above diaphragm) for each patient. The accuracy of each formula was calculated by comparing this ideal distance to the distance estimated by the formula (Bland-Altman method).

RESULTS

Ninety-two infants had UVC inserted and measurements recorded within 48 hours of the procedure. Thirty-eight infants had UVC tip placed too low (> 1 cm below the diaphragm or in the portal venous system) to allow for calculations of the gold standard distance. Fifty-four babies were included, with median (IQR) gestational age 28 (26; 35.8) weeks, and median (IQR) weight 1,035 (740; 2,648) g. Mean difference from the gold standard position, limits of agreement and anticipated success rate calculated by each formula in this population are shown in **Tab. 1**. Calculated UVC tip positions > 1 cm above diaphragm (too high) were: 9.3% (F1), 11.1% (F2), 46.3% (F3), 9.3% (F4) and 24.1% (F5).

CONCLUSIONS

Available formulae to calculate UVC length insertion are not accurate. Using even the best methods, around half of UVCs would need manipulation to achieve a safe position. However, since F3 and F5 overestimate length of insertion

Table 1 (ABS 18). Mean difference from the gold standard position, limits of agreement and anticipated success rate in the population.

Formulae	Mean difference (cm)	Limits of agreement (cm)	Anticipated success rate (%) (CI)
F1. RWH Protocol	0.05	-2.16, 2.26	52 (38-66)
F2. Dunn, 1966	0.16	-2.02, 2.35	46 (33-60)
F3. Shukla & Ferrara, 1986	-1.12	-2.70, 0.46	44 (31-59)
F4. Verheiji, 2010	-0.10	-1.76, 1.56	54 (40-67)
F5. Vali, 2010	-0.59	-3.34, 2.17	54 (40-67)

and therefore catheters could be repositioned by withdrawal, a minority would need to be removed or replaced when using these formulae.

ABS 19

OXYGEN SATURATION LEVELS IN PRETERM INFANTS IN DELIVERY ROOM

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INTRODUCTION

More than one million newborns per year need resuscitation all over the world and the majority of them are preterm infants. Published neonatal resuscitation algorithms about oxygen supplementation to be guided according to oxygen saturation monitoring. Targeted oxygen saturation (SpO_2) levels were determined in Neonatal Resuscitation Program (NRP) for only term neonates. However data on changes in SpO_2 in preterm infants are very limited and are not included in NRP. The aim of this study was to determine SpO_2 trends and to evaluate the factors affecting on the mean time to reach SpO_2 levels of 90% among preterm infants in delivery room.

PATIENTS AND METHODS

The observational study was performed with preterm infants (≤ 35 gestational age) who did not require oxygen supplemantation at the delivery room. Exclusion criteria were as follows; requiring ventilation or medications at birth, congenital abnormalities (including congenital heart disease), complicated pregnancy, poor biophysical profiles and insufficent records. Measurements were performed using new-generation pulse oxymeters. Sensors were placed at the right hand (preductal) and dorsum of the foot (postductal) after cord clamping. The umbilical cord blood gas was conducted and case report forms used to record data that all procedure performed routinely.

RESULTS

According to the preliminary results of the study a total of 134 preterm newly born were analyzed. Seventy of the infants (52.2%) were male and 113 (84.3%) were delivered by ceasarean section. Mean gestational age was 32.9 ± 1.5 weeks, whereas average birthweight was 1,894 ± 343 g. Time to apply sensor was 19.8 ± 3.9 sec, time to first SpO_2 reading measurements were 42.6 ± 9.3 sec (preductal) and 44.4 ± 8.8 sec (postductal). Targeted preductal SpO_2 levels during first 10 minutes of life are outlined in **Tab. 1**. The mean time to reach preductal and postductal SpO_2 level of 90% are shown in **Tab. 2**. Postductal measurements, cesearean delivery, maternal smoking and umbilical cord pH < 7.20 level at birth were detected as factors that delay the time to reach 90% SpO_2 levels.

CONCLUSIONS

In our study, it has been shown that preductal target SpO_2 levels had more narrow range and more slowly increase than reported in NRP. Approaches (oxygen supplementation) in NRP should be evaluated with different SpO_2 set levels for preterm babies according to term ones.

Table 1 (ABS 19). Targeted preductal SpO_2 levels during first 10 minutes of life.

Time, minutes	SpO_2, %
1 min	57-61
2 min	62-67
3 min	68-71
4 min	71-75
5 min	76-81
10 min	88-90

Table 2 (ABS 19). The mean time to reach preductal and postductal SpO_2 level of 90%.

Characteristics	n	Time to reach SpO_2 level of 90% (sec, mean ± SD)			
		Preductal	p	Postductal	p
Gender					
Male	70	8.8 ± 2.0	0.40	10.5 ± 2.2	0.37
Female	64	9.8 ± 9.5		11.8 ± 10.8	
Delivery route					
Vaginal	22	7.8 ± 2.0	**0.04**	9.1 ± 2.3	**< 0.01**
Caesarean	112	9.5 ± 7.2		11.5 ± 8.2	
pH value					
pH < 7.20	26	10.7 ± 1.3	**0.02**	12.5 ± 1.5	**0.04**
pH ≥ 7.20	108	8.7 ± 7.3		10.8 ± 8.4	
Maternal smoking					
Smoking	8	11.5 ± 1.1	**< 0.01**	12.9 ± 1.0	**0.02**
Non-smoking	126	9.1 ± 9.9		11.0 ± 7.8	

Neonatal Transportation

ABS 20

PRE-HOSPITAL TRANSPORT OF THE NEW-BORN: AN UNKNOWN ENTITY?

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INTRODUCTION

Inter-hospital neonatal transport services function effectively across the UK. In contrast, guidelines and information on pre-hospital transport of newborn infants are few. The training for staff to undertake these transfers is similarly varied. The aim of this study was to assess local practice in resuscitation, stabilisation and pre-hospital transfer of newborn babies born outside hospital, with particular regard to monitoring and interventions undertaken during transfer. By better understanding current practice we hope to develop best practice local guidelines as this is an area where a unified, standardised approach may be of benefit.

PATIENTS AND METHODS

Patients were identified from a log of transfers from a Midwifery-led unit (MLU) and from admission records to the tertiary neonatal unit during a 3 year period from 2011 to 2013. 25 babies received pre-hospital transport either from home or from the MLU. A standardised proforma was used to collect information regarding demographics, resuscitation and stabilisation, care during transfer and final outcome. Hospital casenotes were reviewed retrospectively to gather information to complete the proforma. Results were collated and analysed using excel. Of 22 cases meeting inclusion criteria, 18 case notes were available for review within the timeframe of which 2 had limited data available. The remaining notes are awaited, with the hope results can be amalgamated for the full cohort.

RESULTS

55% were male, 45% female. Half were born preterm, a third of whom were below 26 weeks gestation. 45% were born at the MLU, 10% in the ambulance and 45% at home. The reason for transfer was prematurity in 45%, poor condition in 12% and respiratory distress in 12%. Overall documentation of events during transfer was poor, even if documentation before or after was excellent. In 50% there was no documentation whatsoever of events during transfer. 25% showed evidence of assessment or intervention during transfer, only half of these showed regular assessment. Only 13% had the mandatory ambulance patient care record form filed. Where a midwife was present 36% made no documentation. The method of securing the baby was not documented in 70%. Temperature was not checked in any cases. Several required significant resuscitation, 40% required bag mask ventilation and 30% chest compressions.

CONCLUSIONS

We believe the lack of documentation during transport does not truly reflect a lack of care. All babies arrived alive despite significant resuscitation in several cases. Growing evidence that high volume units provide better care has led to centralisation of services. However, not all risk factors present themselves prior to birth. We aim to remedy the deficit of literature with our proposed best practice guideline.

ABS 21

NEONATAL TRANSPORT IN CENTRAL REGION OF HUNGARY

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INTRODUCTION

Prematurity rate in Hungary has not changed for years: it is approximately 8%. The transport of critically ill newborns by dedicated neonatal transport staff has been shown to be associated with a significant better outcome. The Peter Cerny Neonatal Emergency Ambulance Service has been working since June 1989. During a 26-year period over 65,000 premature and sick newborns has been transported, over 12,000 has got ventilatory support, 1,325 resuscitation was made with 90 per cent successfully outcome and 157 active controlled hypothermic treatment has started at the referral hospital and continued during transport.

PATIENTS AND METHODS

Organization and operational plans of the Neonatal Emergency and Transport Service of the Peter Cerny Foundation (NETS-PCA) (**Fig. 1**) is described. The NETS covers the central region of Hungary including Budapest and 6 counties with all together 3-4 million inhabitants in a 100-140 km radial surroundings with a driving distance of 60-70 minutes. The NETS provides neonatal transportation between 11 NICUs of Level-III, 31 referral hospitals with delivery rooms and 10 diagnostic centres. Number of running ambulance cars: 1 x 24/7 car with neonatologists + 1 x 24/7 car with registered neonatal nurse + 1 x 8/5 car with registered neonatal nurse + 1 x 8/3 car with registered neonatal nurse dedicated telemetric ophthalmology + 1 x 24/7 dispatch service.

Figure 1 (ABS 21). The ambulances of the Neonatal Emergency and Transport Service of the Peter Cerny Foundation (NETS-PCA).

RESULTS

Yearly activity of the NETS-PCA – working as a mobile NICU Level-III – includes about 3,000-4,000 neonatal transfer per year, about 1,000 emergency cases, many with acute interventions (i.v. access, intubation, ventilatory support, umbilical cannulation, chest drains), about 1,000 cases back or return transfers to lower level NICUs, about 1,000 cases inter-hospital transport for diagnostic interventions: 340 US, CT, MRI, cardiac echo, 35 surgical, cardiac surgical and neuro surgical, and 700-900 tele-ophthalmologic screening and 65 bedside laser interventions. Mechanical ventilations (800-900 per year) with measuring SAT, BP, HR and 300-400 blood-gas analysis, 35-50 resuscitations per year in delivery rooms (DR), 40-50 surfactant treatments at DR, 20-30 newly born baby per year from home deliveries and 30-40 active hypothermic treatment of asphyxiated newborns during transport.

CONCLUSIONS

With standardized approaches to neonatal transportation we try to ensure the access to facilities appropriate to the care needs of neonatal patients and the transport to different care destinations by highly trained dedicated staff in neonatology. The perinatal mortality rate decreased to 12‰ in the supported area.

ABS 22

ROUTINE MONITORING OF RESPIRATORY FUNCTION VARIABLES DURING INTER-HOSPITAL NEONATAL EMERGENCY TRANS-PORT – A UK REGIONAL TRANSPORT SERVICE EXPERIENCE

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INTRODUCTION

Within the setting of UK neonatal transport, ventilation is usually non-triggered, pressure limited and time cycled rather than volume targeted. During transfer, ventilatory parameters often remain unchanged and blood gases are only performed in the setting of a long transport or if there is evidence of clinical deterioration. Additional respiratory function monitoring can provide information on tidal, minute volumes and endotracheal tube leak. The aim of our study was to evaluate the feasibility and utility of supplementary respiratory function monitoring during inter-hospital neonatal emergency transport.

PATIENTS AND METHODS

Setting

Acute Neonatal Transport Service (ANTS) for East of England.

Design

Prospective observational study of a respiratory function monitor (RFM, Philips Respironics, Connecticut, USA) that has a combined pressure, flow and carbon dioxide (CO_2) sensor placed between the endotracheal tube (ETT) of the infant and the ventilator manifold. We recorded the following baseline values on initial assessment: peak inspiratory, expiratory and mean airway pressure, minute volumes, tidal volumes, $ETCO_2$, resistance, compliance, ETT leak and blood gas results. The RFM was used to guide ventilation during transport. We assessed ventilatory parameters and blood gas results prior to transfer and on admission to receiving unit.

RESULTS

15 infants with a median gestational age 27 (range 24-40) weeks and birth weight 1,180 (range 666-4,280) grams were studied. All infants were ventilated with a median ETT of size 3.0 (range 2.5-3.5) mm with ETT tip T1-T3 on chest X-ray. During transfer, median tidal volumes were 6.1 (range 3.5-8.5) ml/kg; $ETCO_2$ 5.2 (range 3.5-7.5) kPa and minute volumes 0.40 (range 0.06-1.89). Changes were made to the ventilator settings, mainly peak inspiratory pressure and ventilator rate, based on the information from the RFM (tidal volume and $ETCO_2$) in 9 infants. The median and range of pre and post transfer levels were: pCO_2 (5.3 [4.5-7.6] vs. 5.63 [4.37-8.83]) kPa, tidal volumes (5.15 [3.9-7.6] vs. 5.9 [5.1-8]) ml/kg and mean airway pressures (9 [4-12] vs. (10 [3-12]) mmHg.

CONCLUSIONS

Volume targeted ventilation in neonates has been shown to decrease complications and improve outcomes. Although ventilation in a transport setting does not allow for usage of this form of ventilation routinely, adjuncts such as monitoring of important respiratory variables allow clinicians to optimise ventilation, avoid volutrauma and evaluate changes in pulmonary mechanics on a continuous basis reducing hypocarbia and possible reduction in medium to long-term adverse respiratory outcomes.

ABS 23

EXTERNAL CARDIAC PACING DURING NEONATAL TRANSFER – A CASE REPORT

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INTRODUCTION

Congenital heart block is a rare complication of pregnancy associated with Sjögren Syndrome. Congenital heart block occurs in a frequency of 1 in 15,000-22,000 live births. It has been reported to occur in 2% of Ro-positive mothers. It may result in the death of the foetus, infant or may need pacing during neonatal period or childhood. There are only a few case reports of survival from 29 weeks gestation. We present the successful early management and inter-hospital transfer of a 28 week gestation infant with congenital heart block born to a mother with anti Ro/La antibodies. To our knowledge this is the first reported case of transferring an externally paced preterm infant.

CASE REPORT

We report a unique case of a 28 week preterm infant with complete congenital heart block that needed transcutaneous cardiac pacing in hospital and during an inter-hospital transport. Baby was born at 28 weeks gestation by emergency caesarean section.

CONCLUSIONS

This case highlights the successful resuscitation and inter-hospital transfer whilst externally paced. This also illustrates the need for neonatal transport teams to be able to respond flexibly to occasional extraordinary

circumstances while maintaining safety for patient and staff. It describes the successful outcome of both external pacing and internal pacemaker insertion and discharge home of a 28 week infant with congenital heart block (**Fig. 1** and **Fig. 2**).

Figure 1 (ABS 23). CenTre Neonatal Transport Service equipment.

Figure 2 (ABS 23). CenTre Neonatal Transport Service equipment, detail.

ABS 24

NEONATAL TIME CRITICAL TRANSFERS IN THE UK: EXPERIENCE AFTER ONE YEAR OF ITS IMPLEMENTATION

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INTRODUCTION

One of the primordial objectives of the Neonatal Transport Networks in the UK since 2013 has been the adequacy of response timings for the neonatal transport teams from its base, which is known as "Dispatch time" (DT). This DT corresponds with the time from which the call is received from the hospital requesting a Time Critical Transfer (TCT) (**Tab. 1**), until the ambulance departs from the base, and for TCT should be equal or less than 60 minutes. The adequate UK national task for DT, for each Neonatal Transport Unit has been set to 95%. The aim of this poster is to describe the experience in the first year of implementation of this UK national standard.

PATIENTS AND METHODS

We selected retrospectively all neonatal transports considered as "Time Critical" during 2013. We collected data from the neonates as gender, gestational age, birth weight, day of birth and age on the day of transport. We calculated the total "Dispatch time" (DT) of each transport, as well as the analysis of timings. We also collected certain clinical parameters (gasometric values), and details of service for each transport that could have impact on the DT. It was relevant the influence of the presence or not of a doctor in the transport team, as usually it is normally compound by specialist nurses. We also looked at the impact that could have the fact that the transfer is requested in the hour before shift change, or transported by the day or night team.

RESULTS

During 2013 we performed a total of 65 TCT. Most of the transferred infants were males (64.7%) with a mean gestational age of 34.8 ± 5.6 weeks, and with a weight of 2.4 ± 1.0 kg. The causes that motivated the TCT in our series were: cooling therapy (44.7%), intestinal perforation (28.3%), severe cardiorespiratory compromise (19.4%) and duct dependent cardiac lesion (7.4%). Up to 54.5% of the infants required respiratory support during transfer with conventional ventilation. Of the 65

Table 1 (ABS 24). Clinical criteria agreed for Neonatal Time Critical Transports in the UK.

Clinical Criteria for Time Critical Transfers
1. Gastroschisis
2. Ventilated infant with tracheo-esophageal fistula ± atresia
3. Intestinal perforation
4. Suspected duct-dependent cardiac lesion not responding to prostin
5. Unstable respiratory or cardiovascular failure not responding to appropriate management:
a. Despite giving appropriate ventilation via endotracheal tube the infant's respiratory status remains unstable or severely compromised
b. Persistent unstable pneumothorax despite chest drain
c. Requiring FiO_2 100%
d. Arterial oxygen < 5 kPa on 2 consecutive blood gas measurements
e. pH < 7.1 and pCO_2 > 9 kPa
f. Persistent mean blood pressure below corrected gestational age, measured on arterial line; if measured with cuff only, there should also be acidosis (pH < 7.1)
7. Therapeutic cooling required[a]

[a]Added by the local Team.

transport operations, 33.3% required inotropes and 13.6% prostaglandins. We obtained an adequate DT in 49.1% of the transports. In the calculation of the average time of the subdivisions of DT we found that the most time was consumed by the Ambulance Response. The average DT was also higher, and significant, when the critical transfer request was made one hour before shift change (**Tab. 1**).

CONCLUSIONS

For the Neonatal Transport Teams in the UK achieving the task of getting a DT lower than 60 minutes in 95% of all TCT will be a very challenging in the coming years. Our study provides a comprehensive analysis of the causes of delays. We believe that our results provide an interesting experience of a regional transportation unit in the UK in their attempt to reach the standard of carrying at least 95% of TCT in less than 60 minutes.

ABS 25

TRANSPORT EXPERIENCE OF EXTREMELY PRETERM INFANTS BY THE ACUTE NEONATAL TRANSFER SERVICE FOR EAST OF ENGLAND UK

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INTRODUCTION

The Acute Neonatal Transfer Service (ANTS) provides 24-hour emergency transfers for neonatal patients in the 17 hospitals across the East of England region. Extremely preterm infants are transferred from Local Neonatal Units and Special Care Baby Units to one of 3 regional Neonatal Intensive Care Units for ongoing specialist care. They are also transferred to and from the London cardiac centres for PDA ligation. These transfers were reviewed as part of our team's governance procedures alongside the National Service Specifications for Neonatal Transport to evaluate response and stabilization times, clinical stability during the transfer process and any adverse events in this vulnerable group.

PATIENTS AND METHODS

Retrospective review of the transfer documentation of all infants < 27 weeks corrected gestational age who were transferred by ANTS over a 6 month period between September 2014 and February 2015. Data collected included time to dispatch and stabilisation time along with ventilatory requirements, blood pressure and blood gas parameters at the time of referral, immediately prior to transfer and on arrival at the receiving centre. Any complications or critical incidents encountered during the transfer episode were also recorded. 29 infants < 27 weeks gestation were referred during the 6-month period. Gestational age in weeks was 23-23^{+6} (n = 2), 24-24^{+6} (n = 7), 25-25^{+6} (n = 9) and 26-26^{+6} (n = 11). Median weight was 770 g (460-1,040 g).

RESULTS

Median age at referral was 95 mins (17 mins-22 days). Median time to dispatch of team was 33 mins (10 mins-9 hours 45 mins). Median stabilisation time was 147 mins (75-250 mins). The most common clinical presentations were hypotension (n = 13), deranged coagulation (n = 4), sepsis (n = 3) and PPHN (n = 2). 5 were anaemic requiring blood transfusion. 25 of the 29 transfers were completed. Intensive care was withdrawn in 3, 1 transfer was aborted due to instability following PDA ligation. 2 infants were in 100% FiO_2

at referral; of these, 1 died prior to transfer, the other responded to inhaled nitric oxide. Blood gases taken pre-/post-transfer showed the pH had improved or stayed the same in 22 infants and slightly worsened in 3. All had a pH > 7.2 on arrival. There were no reported critical incidents (e.g. unplanned stops) or clinically significant deteriorations en route.

CONCLUSIONS

ANTS transferred 25 of 29 infants referred in a 6-month period. The team dispatched within 60 mins to 16 of the 29 referrals (55%) a figure set to improve with increased investment in the service, enabling provision of 3 overlapping emergency teams per 24 hrs. No critical incidents occurred during transfer; 88% tolerated the journey well, arriving at receiving centres with minimal changes in mean blood pressure and improved blood gas parameters.

ABS 26

A CASE OF CONGENITAL TRACHEAL AGENESIS COMPLICATING INTER-HOSPITAL NEONATAL EMERGENCY TRANSFER

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INTRODUCTION

Congenital tracheal agenesis (TA) is a rare defect that usually presents as an unexpected airway emergency. Almost universally lethal, it has an incidence of 1 in 50,000 newborns with a male to female ratio of 2:1 and consists of complete or partial absence of the trachea below the larynx, with or without a concomitant tracheo-oesophageal fistula (TOF). It was initially described in 1900 and since then few cases have been published worldwide.

CASE REPORT

We describe a case of Floyd Type I TA with a distal TOF (**Fig. 1**) in a female newborn with additional congenital malformations, which resulted in a challenging and difficult transfer between neonatal units.

A primigravida presented with spontaneous onset of labour to a Local Neonatal Unit at 30 weeks and 3 days. This was a twin pregnancy (DCDA twins), antenatal scans showed polyhydramnios in Twin 2. There was no relevant maternal history.
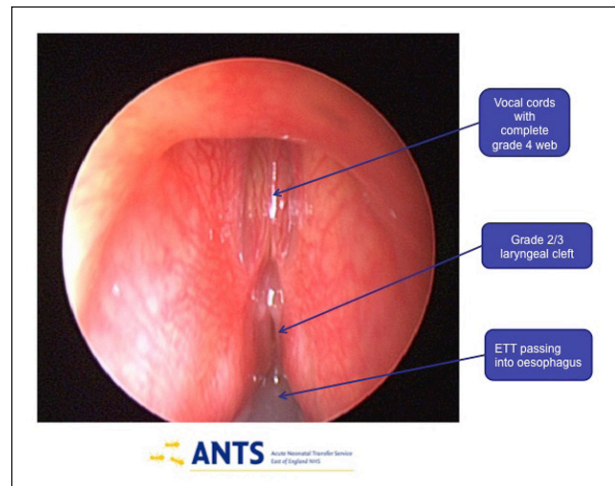

Figure 1 (ABS 26). Floyd Type I tracheal agenesis (TA) with a distal tracheo-oesophageal fistula (TOF).
ANTS: Acute Neonatal Transfer Service.

CONCLUSIONS

TA is a severe congenital airway defect which is extremely challenging to manage, even in a centre with paediatric ENT expertise. Undetected, it is a rare but potentially catastrophic cause of neonatal collapse during transfer. In an infant with unexplained need for repeated ETT changes, polyhydramnios and other congenital malformations, a high index of suspicion is needed to identify this potentially lethal malformation.

ABS 27

IS ECHOGRAPHY USEFUL IN PEDIATRIC MOBILE INTENSIVE CARE UNIT? A 2 MONTHS PRELIMINARY EXPERIENCE

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INTRODUCTION

Echography (US) is a quick, validated and well established technique in intensive care units. Less than 14% of French mobile intensive care unit have a device on board of one of their ambulance (Ginoux, 2014). Size, price, difficult learning and operator variability restrict US use. We try to investigate feasibility and usefulness of heart US with repeated haemodynamic assessment of stroke volume (SV), in a pediatric mobile ICU during 2 months.

PATIENTS AND METHODS

We enrolled prospectively infants and toddlers aged < 2 years, without major malformations. US were all performed with M-Turbo® (FUJIFILM SonoSite, Inc) by the same trained operator. Heart morphology was systematically studied, and stroke volume measures were repeated before, during and after ride.

RESULTS

30 patients were enrolled and 577 SV assessments were performed. Transfer lasted on average 31 ± 19 min. Echocardiography was always possible without move the patient and without side effects. After performing a morphological exam and haemodynamical assessment, mean time during ride for having a SV evaluation (with aortic velocity-time integral) was 1.5 min. Coefficient of variability was 64%; SV values were not different before, during or after ride (repeated measures ANOVA).

US was useful in about 30% of patients: 4 early diagnostics of bradycardia and low flow before cardiac arrest or confirmation of a cardiac arrest (before usual devices), 2 congenital heart defect (changing hospital destination), 1 help in haemodynamic management, viral myocarditis, elimination in 3 suspicious respiratory distress and elimination of a shaken baby syndrome (Trans-fontanellar echography).

CONCLUSIONS

This preliminary study encourages to use US in pediatric mobile ICU, especially with new portable devices. More studies are necessary in order to define utility and guidelines in children.

ABS 28

ASSESSMENT OF THE TREATMENT OF RESPIRATORY DISTRESS SYNDROME IN THE PREMATURES BELOW 32 WEEKS OF GESTATION TRANSFERRED VERSUS THE ONES BORN IN THE III LEVEL UNIT. EXPERIENCE FROM A REGIONAL CENTER IN ROMANIA

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INTRODUCTION

The national guide on neonatal transport and stabilization of the newborn was approved in 2011.

The implementation of the guidelines still remains an issue despite the regionalization policy.

The paper aims to assess the treatment of respiratory distress syndrome in a regional center for the inborns prematures under 32 weeks of gestation versus the outborns prematures transferred. Assessment aims to determine the moment of surfactant administration; the quantification of the methods of resuscitation; the analysis of the type of respiratory support, the oxygen therapy and the complications in both subgroups.

PATIENTS AND METHODS

It is a retrospective study which took place in Neonatology Department from County University Hospital Cluj, Romania, between 2011-2013, on 193 admitted premature infants under 32 weeks of gestation: out of which 50 were transferred from II and I level unit.

All were admitted to NICU, where the following biomarkers were assessed: Astrup parameters, neonatal resuscitation quantification, CBC, glucose, serum calcium, AST, APT, bilirubin, Na, K, hemoculture, CRP, BUN and creatinine.

We monitored the type of respiratory support, FiO_2, transfontanellar ultrasonography at admission, ecocardiography.

The first examination for ROP was done at the age of four weeks. Statistical data were processed in Statistics VII. Informed consent were signed for all infants.

RESULTS

Characteristics of inborns: GA = 29.4 ± 2.0 weeks, BW = 1,311 ± 381 g; characteristics of outborns: GA = 29.5 ± 2.1 weeks, BW = 1,318 ± 423 g.

The severity of RDS was significantly higher in the transferred newborns (p = 0.00002).

The inborns received surfactant at 222 ± 604 minutes of live compare to the outborns at 2,492 ± 1,425 minutes (p = 0.00).

CPAP was needed on average 81 ± 101 h in inborns versus 121 ± 16 h in transfered (p = 0.01).

Mechanical ventilation needed for 50 ± 14 h at inborns versus 93 ± 19 h to outborns.

Oxygen therapy was significantly longer in the transferred: 12.93 ± 7.32 days vs. 5.12 ± 3.49 (p = 0.0001).

Bleeding complications were significantly higher in outborns: pulmonary gastrointestinal and cerebral hemorrage.

Late complications: ROP and BPD had a significantly higher incidence in outborns.

CONCLUSIONS

The severity of RDS was greater in transferred newborns. Oxygen supply was significantly higher in the first week of life in outborns.

Timing of administration for the first dose of surfactant was significantly delayed in the transferred neonates.

Haemorrhagic (pulmonary, digestive and cerebral) complications had a significantly higher incidence in transferred newborns.

Late complications: BPD and ROP showed higher incidence in outborns.

Organization of perinatal care

ABS 29

MEDICAL STAFF PERCEPTIONS OF THE COST OF CONSUMABLE ITEMS USED IN NEONATAL INTENSIVE CARE

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INTRODUCTION

Medical staff who work in neonatal intensive care units (NICUs) frequently order tests and interventions that involve the use of consumable items. We wished to determine how their perceptions of the cost of some of these items compared to their actual cost.

PATIENTS AND METHODS

Medical staff completed a questionnaire where they recorded their estimate of the cost of one of each of 20 consumable items that are commonly used in our NICU. These items included intravenous cannulae, gloves, lumbar puncture needle, surfactant, respiratory support device circuits and parenteral nutrition. The prices ranged from 27c to €760. Participants recorded their estimates independently of each other. We compared their estimates to the cost of each item listed in the stock inventory list provided by the central supplies department in our hospital. We determined that the estimate of the cost of the consumable was correct if it was within 10% of the actual cost.
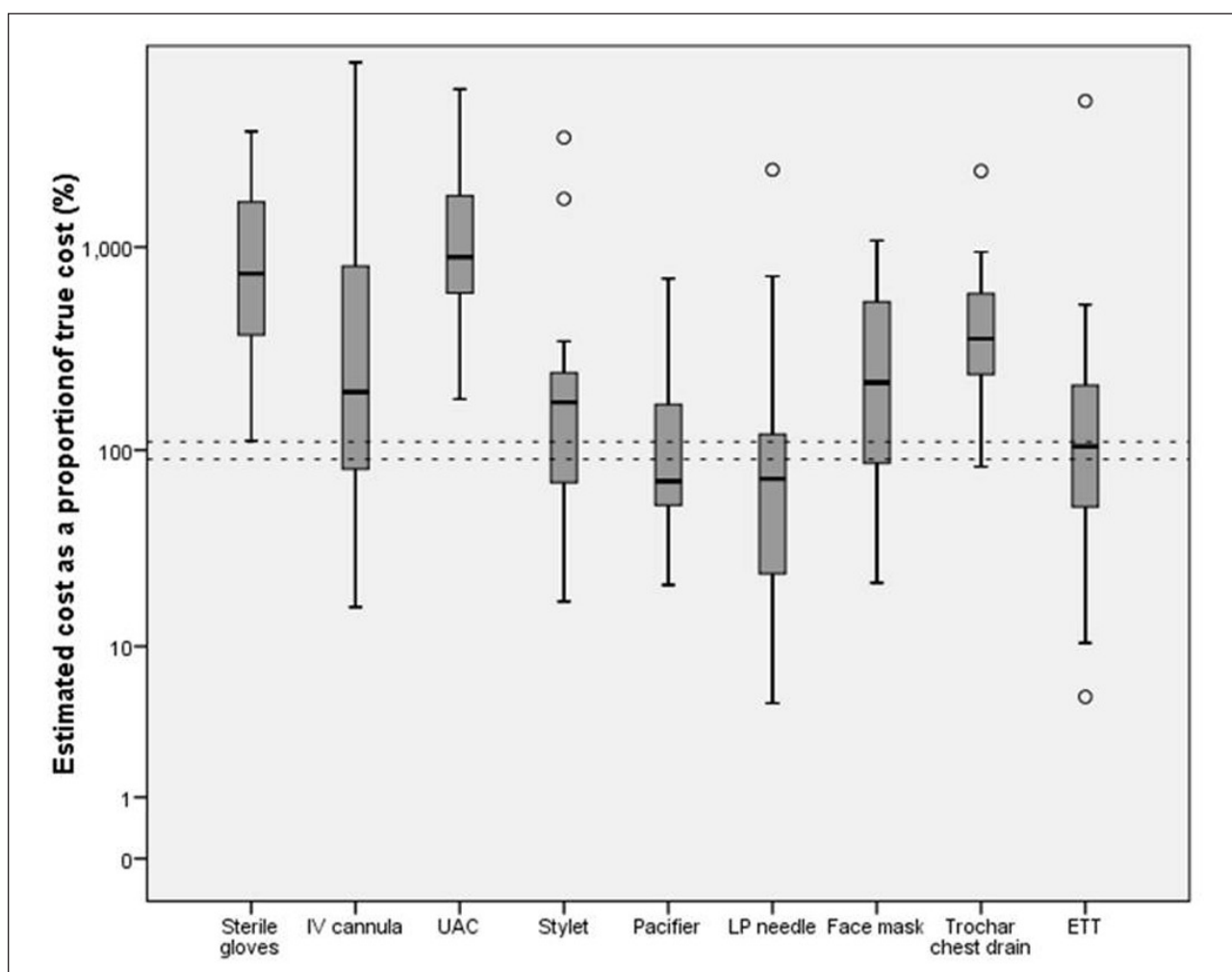

Figure 1 (ABS 29). Estimated cost of consumable items that cost less than €10.
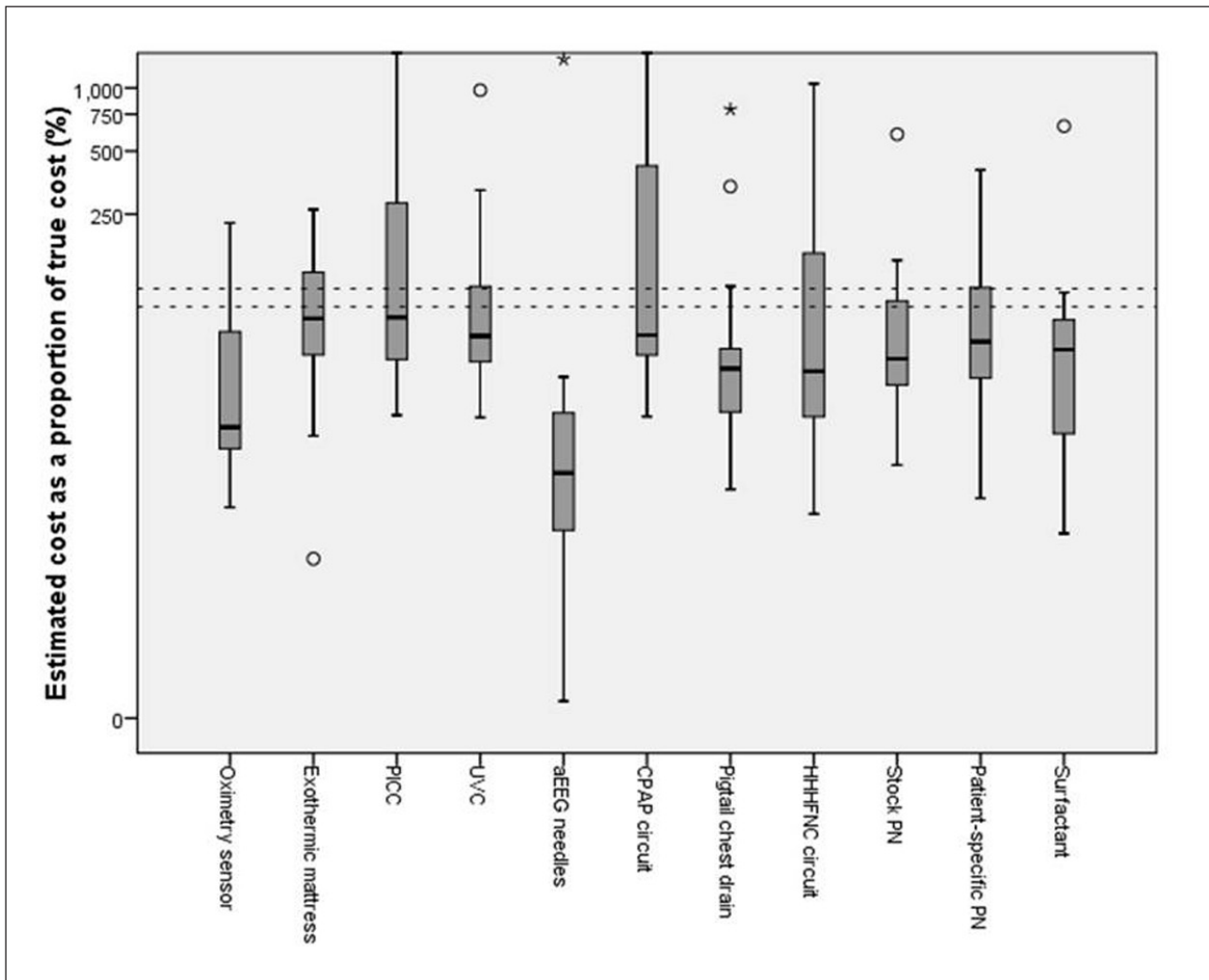
Figure 2 (ABS 29). Estimated cost of consumable items that cost more than €10.

RESULTS

Twenty-one doctors completed the questionnaire. Overall 23/420 (6%) estimates were correct. Overall doctors more frequently underestimated the cost of items. Participants more often over-estimated the cost of items that costed less than €10 (median estimate greater than actual cost for 6/9 items, **Fig. 1**); and underestimated the cost of items that costed more than €10 (median estimate less than actual cost for 11/11 items, **Fig. 2**). The individual estimates varied widely and were very inaccurate.

CONCLUSIONS

Neonatal doctors' perceptions of the cost of the consumable items they use are frequently inaccurate and most often underestimate the true cost.

ABS 30

IMPLEMENTATION OF PULSE OXIMETRY SCREENING IN DETECTING CRITICAL CON-

GENITAL HEART DISEASES IN NEWBORNS. EXPERIENCE OF A TERTIARY NEONATAL CARE UNIT

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INTRODUCTION

Newborn screening has led to improvement in the neonatal care. Despite the progress in obstetrician and neonatal care early diagnosis of critical congenital heart diseases (CCHD) in newborns may be missed because of the short stay in the neonatal unit. It is known that many newborns with CCHD do not develop clinically appreciable signs prior to discharge from nursery. This can lead to circulatory collapse resulting from undiagnosed CCHD. The use of pulse oximetry screening is recommended to increase detection of these conditions. The

usefulness of this method in a tertiary care neonatal unit can be different from other sites.

Early detection of CCHD improves the effects of treatment.

PATIENTS AND METHODS

A screening pulse oximetry test was conducted in the Tertiary Neonatal Care Unit of Medical University of Gdansk in Poland between April 01, 2013 and March 31, 2014. Screening was performed in newborns born after 34 week of gestation staying in the well-baby and intermediate-care nursery. Newborns treated in the Neonatal Intensive Care Unit (NICU) and with prenatal diagnosis of CCHD were excluded. A single pulse oximetry measurement was conducted between the 2 and 24 hours of life on a lower extremity. An oxygen saturation level > 95% was considered normal, and a level ≤ 95% led to cardiovascular evaluation and echocardiography. Confirmation of CCHD requiring surgery in the first 12 months was performed by making contact with infants' parents.

RESULTS

Among 2,417 analysed babies, 29 (1.2%) CCHD was detected. Of them 23 (79.3% of all CCHD) were diagnosed prenatally, 3 (10.3%) were diagnosed following circulatory collapse, 2 (6.9%) were initially diagnosed by pulse oximetry (true positive test). There was 1 (3.5% of all CCHD) false negative result. Infants hospitalised in NICU (23), those with prenatal diagnosis (23) and 6 well infants were not screened. Pulse oximetry screening was performed in 2,365 cases: 2,245 (94.9%) passed screening, 120 failed. In the 118 cases with saturation ≤ 95% but no CCHD (false positive cases) 14 had other CHD, 1 respiratory pathology, 2 hypertrophic cardiomyopathy, 36 transitional circulation, 65 had no cardiac pathology.

The false positive rate was 4.9%. The sensitivity of the test was 66.6%, specificity 95%. The positive predictive value was 1.7% and negative 99.9%.

CONCLUSIONS

Early screening until 24 hours of life leads to false positive results due to transition from fetal to neonatal circulation.

There is a need to establish the threshold for a positive pulse oximetry test to reach balance between the harm of missing CCHD against the harm of false positive test.

In our tertiary care unit most of CCHD was detected by prenatal echocardiography.

Pulse oximetry screening was useful in excluding CCHD.

ABS 31

EVOLUTION TRENDS AND SURGICAL APPROACH IN HYPERTENSIVE DISEASE OF PREGNANCY

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INTRODUCTION

Hypertension (HTA) is a problem of modern obstetrics. Surgical overactive behavior represented by caesarian section for interruption of pregnancy remains the first intended therapeutic option.

PATIENTS AND METHODS

We carried out a retrospective study for the years 2012-2013 regarding the evolution and surgical attitude in pregnant women who develop hypertension. We have analyzed the documents from the Medical Department of Obstetrics and Gynecology and Neonatology. The selection criteria of the studied group were: systolic tension ≥ 140 mmHg, diastolic tension ≥ 90 mmHg. The condition was that these values appeared for the first time after 20 weeks pregnancy in a normotensive patient. The evolution of neonates has been interpreted.

RESULTS

Out of total number of 4,312 deliveries, 340 (7.88%) evolved with arterial hypertension induced by pregnancy. Of those 194 (57.05%) have gone through caesarian section. The incidence of preeclampsia was 9.11% and severe form of drug resistant HTA was encountered in 57.05% of cases. Complications were represented by HELLP Syndrome (4.3%) and DPPNI syndrome (7.21%). As associated pathology pregnancy with diabetes was present in 2.35% of the cases and multiple pregnancy in 1.42%. Prematurity incidence was 8.67%, and 16.66% out of it of was extremely premature age.

CONCLUSIONS

The option to deliver by caesarian section in the case of women with hypertension induced by pregnancy remains at the discretion of the specialist. Actually the fetus evolution is leading the moment when to perform caesarian section that is the moment the uterus becomes a hostile environment.

ABS 32

PULSE OXIMETRY SCREENING IN COMMUNITY MIDWIFERY: ACCEPTABILITY OF MOTHERS AND COMMUNITY MIDWIVES

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INTRODUCTION

During the period of October 2013-October 2014 a feasibility study for pulse oximetry (PO) screening for critical congenital heart defects after homebirths and early discharge was performed in the Leiden region, the Netherlands. The perinatal care system is unique due to 33% of births supervised by community midwives, and discharge within 5 hours after an uncomplicated birth in hospital. PO was performed ≥ 1 hour after birth and at day 2 or 3 of life, at home, birthing facility or in hospital. This was the first study with PO screening adapted to homebirths. We aimed to assess the acceptability of this screening to mothers and community based midwives.

PATIENTS AND METHODS

All mothers who participated in the PO screening study in Leiden and gave birth supervised by community midwives received an online survey. The survey contained questions on acceptability and importance of the screening and was sent within a week after delivery. Also, a paper survey was sent to all community midwives who performed the screening. Questions on time to screen, usefulness and acceptability were asked.

RESULTS

1,150 mother and 19 community midwives responded to the survey. Overall, mothers are happy with the way the test was performed (95%), think the test is important for their babies (87%) and for all babies (93%), and would recommend the screening to others (93%). 63% of the midwives say that the screening costs < 5 minutes, and 68% find the time to screen acceptable. All midwives want to have PO device included in their standard equipment, and 63% think the screening should be implemented universally. PO provides useful information in case of reanimation (89%), decision to admit the infant (63%), doubt on colour (58%), tachy-dyspnea (74%), and suspicion of infection (74%).

CONCLUSIONS

This is the first study assessing acceptability of PO screening after homebirth. Overall, mothers are happy with the performance of the test, think it is important and would recommend it to others. The PO device provides the community midwives with useful information, and the time to screen is acceptable to them. All midwives want the device to be in their standard equipment.

ABS 33

PERINATAL OUTCOME OF PREGNANCY WITHOUT ANTENATAL CARE

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INTRODUCTION

The essential elements of focused antenatal care (ANC) are the surveillance of the pregnant woman and the development of the expected child, the protection of their health, the recognition and management of pregnancy-related complications, the help of pregnant women to prepare emotionally and physically for birth and care of their baby, particularly preparing for early and exclusive breastfeeding. At present, ANC is not obligatory but strongly recommended according to Hungarian laws.

PATIENTS AND METHODS

A retrospective analysis was carried out on the data on all mothers who have not attended ANC but delivered at the Department of Obstetrics and Gynaecology, University of Szeged, between 1 January 2005 and 31 December 2011. During this 7-year period, 17,507 births were recorded, and 142 (0.81%) of these mothers had never attended ANC. We analysed the maternal age, qualifications, marital status and the number of previous pregnancies and deliveries; neonatal data and transfer into the children's home. We compared our data to the national ones regarding all deliveries during this period, collected by the Hungarian Central Statistical Office.

RESULTS

The mean maternal age among uncared pregnancies was 26.8 ± 7.4 years; 13 (9.2%) women were under 18. 82 (58.1%) were unmarried, 28 (19.8%) did not finish elementary school. The mean gestational age was 36.7 ± 3 weeks; the mean birth weight was 2,825 ± 624 grams, this was significantly lower than the national mean birth weight (3,340 g). The rate of Caesarean section was significantly lower than in the control group (20.4% vs. 26%). Compared to the national data there were significantly higher preterm labours (30.3% vs. 9%), intrauterine growth retardation (16.9% vs. 10%). The rate of congenital malformations was higher, but this difference was not significant. The rates of transfer to the Neonatal Intensive Care Unit were similar in the two groups. Significantly more neonates were given up for adoption and transferred to the Childrens' Home as compared to the control group (22.5% vs. 0.4%).

CONCLUSIONS

Pregnant women who did not attend ANC had lower educational level and were mainly unmarried. Significantly higher rate of preterm birth, intrauterine growth retardation, congenital malformations and transfer to the Childrens' Home were observed in this group. The prevention of unexpected pregnancies and the responsibility of becoming a mother should get more emphasis during health education.

ABS 34

DEVELOPMENT OF A TOOL TO CALCULATE NEONATAL INTENSIVE CARE COT AVAILABILITY

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INTRODUCTION

The assessment of a Neonatal Intensive Care Unit (NICU)'s ability to admit patients and accept referrals depends on several factors including the number of patients and their level of dependency, the availability of physical cot spaces, the number of nurses and midwives, planned admissions and the availability of equipment. In a 26 bed Scottish tertiary level NICU with associated regional fetal medicine unit we developed a tool to facilitate the objective assessment of the current unit status to enable planning of admissions, discharges, transfers and nursing requirements on a daily basis.

PATIENTS AND METHODS

A Microsoft® Excel® spreadsheet was created in consultation with medical, nursing and management colleagues. The number of patients meeting the British Association of Perinatal Medicine (BAPM) categories of care and the number of expected admissions and discharges were recorded. The number of available nursing staff for the current and subsequent shifts was recorded and a "Nurse Status" of Black, Red, Amber or Green (RAG) was calculated.

The total number of commissioned cots, the maximum number of Intensive and High Care patients and maximum level of workload were documented to enable calculation of "Cot Status" using the RAG rating. The tool was developed to facilitate changes to these over time without affecting prior calculations.

A "Unit Status" reflected the greatest of the Cot Status and Nurse Status.

RESULTS

Over 3 years from January 2012 data were entered each morning by medical and nursing staff after establishing patient dependency based on BAPM criteria. The tool was utilised on 1,061 days (97%) with 35 days having incomplete or absent data.

On 425 days (40%) the "Unit Status" at time of recording was Red or Black indicating that demands on cots were high or there were, on paper, insufficient nurses to admit a new intensive care patient. This was attributed to Cot Status on 188 days (44%), Nurse Status on 97 days (23%) and both on 140 (33%).

Of the 626 days when the "Unit Status" was not green, improvement was anticipated during the day on 22% of occasions.

The use of the tool by both nursing and medical staff facilitated the coordination of patient care and the response to concerns through increased staffing or patient transfer.

CONCLUSIONS

We created a simple to use tool which given an at a glance, coloured indication of the unit's patient, nurse and overall status (**Fig. 1**).

It has been well received and it is now well utilised across our health board. It has facilitated planning of patient care and nursing requirements on a daily basis. Its greatest limitation is that it represents a snapshot in time and may benefit from integration into a live electronic patient record.

Nursing Complement						Nursing Status				Cot Status								Overall Unit Status			
Day Shift			Night Shift																		
Co-Ordinator	Trained Staff	Untrained Staff 2/3/4 (Pt)	Co-Ordinator	Trained Staff	Untrained Staff 2/3/4 (Pt)	Required no. of nurses directly caring for patients	Required no. of nurses directly caring for patients	Nurse Status (Current)	Nurse Status (Expected)	IC+HC Cots Available (Current)	Total Unit Cots Available (Current)	Unit dependency Score (current)	Unit Cot Status (Current)	IC+HC Cots Available (Expected)	Total Unit Cots Available (Expected)	Unit dependency Score (Expected)	Unit Cot Status (Expected)	Calculated Current	Adjust Current Status	Calculated Expected	Adjust Expected Status
1	11	1	1	6	3	9.25	9.25	Green	Green	5	8	37	Amber	5	8	37	Amber	Amber		Amber	
1	10	1	1	9	1	8.75	8.75	Green	Green	6	7	35	Green	6	7	35	Green	Green		Green	
1	9	1	1	10	1	8.5	8.25	Green	Green	6	6	34	Green	6	5	33	Green	Green		Green	
1	8	2	1	9	0	8.75	10	Green	Amber	5	6	35	Green	4	4	40	Amber	Green		Amber	
1	8	2	1	9	2	9.5	9.5	Amber	Amber	7	3	38	Amber	7	3	38	Amber	Amber		Amber	
1	9	2	1	10	2	9	8	Green	Green	7	3	36	Green	8	4	32	Green	Green		Green	
1	8	2	1	9	2	7	7.25	Green	Green	9	5	28	Green	9	4	29	Green	Green		Green	
1	8	1	1	9	2	7.5	7.5	Green	Green	8	4	30	Green	8	4	30	Green	Green		Green	
1	9	0	1	9	2	9.5	9	Red	Amber	7	1	38	Amber	7	3	36	Green	Red		Amber	
1	10	1	1	10	1	9	9	Green	Green	7	3	36	Green	7	3	36	Green	Green		Green	
1	9	3	1	9	1	9	9.75	Green	Green	7	3	36	Green	6	3	39	Amber	Green		Amber	
1	9	2	1	9	1	10	10.75	Green	Amber	6	2	40	Amber	5	2	43	Red	Amber		Red	
1	10	1	1	10	1	10.75	9.5	Amber	Green	5	2	43	Red	6	4	38	Amber	Red		Amber	
1	7	2	1	10	1	11	11	Black	Black	4	2	44	Red	4	2	44	Red	Black		Black	
1	9	1	1	10	1	11.5	11	Black	Black	4	0	46	Black	4	2	44	Red	Black		Black	
1	9	1	1	9	1	9.5	10.25	Amber	Red	6	2	38	Amber	5	2	41	Red	Amber		Red	
1	8	1	1	10	2	8.25	8.75	Amber	Amber	7	6	33	Green	6	7	35	Green	Amber		Amber	
1	9	1	1	9	1	8.5	8	Green	Green	6	6	34	Green	6	8	32	Green	Green		Green	

Figure 1 (ABS 34). Example of the tool to calculate neonatal intensive care cot availability.

ABS 35

MONITORING HEART RATE IN PREMATURE INFANTS IMMEDIATELY AFTER BIRTH: PRELIMINARY RESULTS

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INTRODUCTION

Heart rate (HR) measurement is used to evaluate the need for and response to resuscitation at birth. Increasing HR is a basic marker of effective resuscitation, and HR > 100 bpm is expected normal. HR is usually detected by palpation of the umbilical cord and auscultation immediately after birth. However, it is possible to measure the HR with pulse oximetry which is increasingly used during neonatal resuscitation. The objective of this study is to describe the HR in premature infants immediately after birth measured by pulse oximetry.

PATIENTS AND METHODS

The observational study was performed with preterm infants (≤ 35 gestational age) who did not require oxygen supplementation at the delivery room. Exclusion criteria were as follows; requiring ventilation or medications at birth, congenital abnormalities (including congenital heart disease), complicated pregnancy, poor biophysical profiles and insufficent records. Heart rate measurements were performed using new-generation pulse oxymeters. Immediately after birth a pulse oximetry sensor was placed at the right wrist then HR measurements were recorded during first 15 minutes of life.

RESULTS

Preliminary results of the study; a total of 134 preterm newly born were analyzed. Seventy of the infants (52.2%) were male and 113 (84.3%) were delivered by ceasarean section. Mean gestational age was 32.9 ± 1.5 weeks, whereas average birthweight was 1,894.3 ± 343.3 g. Heart rate measurements during first 15 minutes in premature infants were shown in **Tab. 1**. It was remarkable that the average of HR was below 100 bpm in the first minute of

Table 1 (ABS 35). Heart rate measurements during the first 15 minutes in premature infants.

Time from birth (min)	Heart rate (bpm), mean ± SD
1	98.9 ± 10.7
2	115.5 ± 12.9
3	132.7 ± 10.4
4	148.8 ± 16.7
5	155.4 ± 14.5
6	154.6 ± 13.1
7	155.6 ± 12.1
8	155.8 ± 10.9
9	155.8 ± 8.0
10	155.8 ± 7.7
11	156.5 ± 7.5
12	157.1 ± 8.7
13	156.4 ± 8.6
14	157.0 ± 8.0
15	156.5 ± 8.9

life. 64 (50.4%) of the infants had a HR < 100 bpm at 1 minutes and there were 17 (12.8%) premature infants with a HR < 100 bpm at 2 minutes.

CONCLUSIONS

The initial assessment cornerstone in first minute of life is considered to be HR > 100 bpm in neonatal resuscitation algorithm. Hence we found that the mean HR for premature infants was < 100 bpm at 1 min. HR < 100 bpm at 1 min of life may be considered normal, it should be evaluated with respiratory effort and muscle tone and not isolated from other signs, should not be an indication for immediate ventilation.

ABS 36

PROVIDING IMMEDIATE NEONATAL CARE AND RESUSCITATION AT BIRTH BESIDE THE WOMAN: PARENTS' VIEWS, A QUALITATIVE STUDY

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INTRODUCTION

Family presence during resuscitation of adults and children is often preferred by families and can be beneficial. Only one study has explored parents' experiences with newborn resuscitation and this was with fathers. As part of a programme of work to improve outcome and quality of care following preterm birth we developed strategies for providing newborn life support at birth beside the woman. The aims of this study were to assess parents' views of immediate neonatal care and resuscitation at birth being provided beside the woman, and their experiences of a mobile trolley designed to facilitate this bedside care.

PATIENTS AND METHODS

A qualitative study with semi-structured interviews. Parents were recruited from a large UK maternity hospital. Women whose baby received initial neonatal care in the first few minutes of life at the bedside, and their birth partners, were eligible. 30 participants were interviewed (19 mothers, 10 partners, and one grandmother). Five babies required advanced neonatal resuscitation. Results were analysed using thematic analysis.

RESULTS

Five themes were identified: 1) Reassurance, which included 'Baby is OK', 'Having baby close', 'Confidence in care', 'Knowing what's going on', and 'Dad as informant'; 2) Involvement of the family, which included 'Opportunity for contact', 'Family involvement', and 'Normality'; 3) Staff communication, which included 'Communication', and 'Experience'; 4) Reservations, which included, 'Reservations about witnessing resuscitation', 'Negative emotions', and 'Worries about the impact on staff'; and 5) Experiences of the trolley, which included 'Practical issues', and 'Comparisons with standard resuscitation equipment'.

CONCLUSIONS

Our findings suggest that bedside care is valued by parents as it allows them to see and touch their baby at birth so they are involved in the first moments of their baby's life, and provides reassurance that they know what is happening to their baby. Some parents reported experiencing negative emotions as a result of witnessing resuscitation of their baby. Parents were positive about the trolley.

ABS 37

TRANSITIONAL CARE ON THE POSTNATAL WARD – IS IT TIME FOR A CHANGE?

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INTRODUCTION

Transitional care (TC) i.e. a baby requiring more than 'normal' care but not enough to satisfy neonatal unit (NNU) admission, is often undertaken on the postnatal ward (PNW). This has the advantage of keeping the mother and baby together and is less costly than NNU admission. However if the PNW is busy or the staffing skill mix not appropriate, these baby may need NNU admission. Also do these babies received appropriate, timely and safe care on busy PNWs?

The aim of this study was to assess how many babies currently receive transitional care (TC) on our PNW to determine if a dedicated transitional care ward is warranted.

PATIENTS AND METHODS

We are a sub-regional obstetric and neonatal unit. At the moment the number of babies receiving TC on the PNW is not recorded on any database. These babies were monitored for 9 months in

2014. The number of babies per day and the reason for TC was recorded. TC was subdivided into: intravenous antibiotics; regular observations (24 hours for prolonged rupture of membranes, PROM, or maternal Group B streptococcal infection; 12 hours for meconium passed pre delivery); neonatal abstinence symptom screening (Finnegan score); blood glucose monitoring and management in at risk infants; phototherapy; nasogastric tube feeds.

RESULTS

The bed occupancy for TC ranged from 1 to 10 per day, with a total of 1,178 babies over the 9 months. The median was 5 babies/day (on 55 days), mean 4.6 babies, but on 24 days there were 7 babies, on 14 days 8 babies, on 6 days 9 babies and 10 babies on 4 days. This suggests a 7 bedded TC, although the additional number of TC babies currently nursed on NICU is unknown.

The distribution of the TC was:
- intravenous antibiotics – 40.1%;
- regular observations – 26.1% (PROM or GpB strep – 19.3%; meconium – 6.8%);
- Finnegan scoring – 15.2%;
- blood glucose monitoring in at risk infants – 8.9%;
- phototherapy – 9.3%;
- nasogastric tube feeds – 0.4%.

2 trained midwifes or nurses are required to administer i.v. antibiotics. Finnegan scoring is time consuming due to the observation time required for meaningful scores as is blood glucose monitoring and treatment (heel prick testing and frequent feeds).

CONCLUSIONS

A significant amount of TC (1,171 patient days in 9 months, equating to 1,560 per year) is currently undertaken on our PNW. With a stretched midwifery service this is a concern for optimal care which would be addressed with an appropriately staffed TC ward. In addition some care currently undertaken on the NNU may be suitable for a TC ward, keeping the babies with their mothers.

ABS 38

MONITORING OF ANTENATAL STEROIDS, DELAYED CORD CLAMPING AND THERMO-REGULATION (MASCoT)

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INTRODUCTION

There is growing evidence that management around the time of birth of preterm infants has an impact on their long term outcome. Consequently, millions of pounds are spent in developing evidence based treatments (EBT) to improve the care around the time of birth of these infants. However, not all eligible patients receive every relevant EBT. To improve clinical outcomes, it is important to know the proportion of patients who fail to receive EBT and the factors preventing their reliable delivery.

PATIENTS AND METHODS

The objective of this audit was to evaluate the effectiveness of existing systems of service provision in delivering EBT reliably around the time of birth of infants born before 29 weeks. This is a prospective study of such infants born and admitted to the tertiary neonatal unit at Southern General Hospital between June 2013 and August 2014. The three EBTs that were monitored are 1) antenatal steroids (ANS), 2) delayed cord clamping (DCC) and 3) thermoregulation. In addition, some of the related clinical outcomes were also monitored.

RESULTS

A total of 41 patients were included in the study. The mean gestational age was 26^{+3} weeks and birth weight was 994 g.

Process reliability
1. ANS: only 78% of mothers received at least one dose of ANS (56% received a complete course and 22% received at least one dose).
2. DCC: of either 30 s or 60 s was carried out in only 59% of infants.
3. Thermoregulation: plastic bags were used in only 66% of deliveries.

All three evidence based treatments were received by only 41% of the study population.

Outcomes
1. The mortality rate in the study population was 9.7%.
2. The incidence of chronic lung disease was 61.7%.
3. Hypothermia was noted in 51% of infants with an admission temperature below 36.5°C. The mean temperature of the cohort was 36.3°C.
4. The mean blood transfusion rate was 3.5 transfusions.

CONCLUSIONS

The findings from the study suggest that the delivery of EBT is sub-optimal. Some of the reasons for sub-optimal delivery of EBT such as birth before arrival to hospital are beyond the control of systems of service delivery. However, there is potential

to improve clinical outcomes of these infants by identifying and developing interventions to overcome other factors preventing the reliable delivery of EBT.

ABS 39

FEASIBILITY OF AN AGE-APPROPRIATE ADDITION TO A PREVENTIVE POST-DISCHARGE INTERVENTION FOR VERY PRETERM TODDLERS; A PILOT STUDY

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INTRODUCTION

Very preterm birth (gestational age < 32 weeks) is strongly associated with developmental problems. In the Netherlands, a preventive responsive parenting intervention (ToP program) has been developed with beneficial effects on very preterm infants motor development (6, 12 and 24 months CA), performance IQ and visuo-motor integration (5.5 years of age). An age-specific additional intervention building on the principles may further improve the development of the child. Objectives of this pilot study were to evaluate the feasibility and to examine preliminary effects sizes of this additional intervention in very preterm toddlers.

PATIENTS AND METHODS

At 18 month corrected age (CA), very preterm children who received the parenting intervention in their first year were randomized to the additional intervention or usual care. The intervention consisted of 4 to 6 home visits between 18 to 22 months CA. Parents were supported to responsively interact during play and daily activities with their toddlers. Feasibility was measured as rated by parents and interventionists. At 18 and 24 months CA, parents completed three questionnaires concerning their child's behavior (ITSEA), development (ASQ), and receptive language (LEXI-list). At 24 months CA, the children's motor and cognitive development (BSID-III) and parent-child interaction (EAS) were evaluated.

RESULTS

Of the 94 eligible children, parents of 60 children (64%) decided to participate. The intervention group all completed the intervention (mean 4.3 visits). Parents reported the intervention useful and the interventionists as knowledgeable. The interventionists perceived the process and relationship based approach useful. For differences in groups, outcomes were adjusted for gestational age, gender, maternal education, and small-for-gestational-age. Effect sizes (in favor of the intervention) were medium (> 0.5 SD) for cognitive development (dysregulation behavior and personal social development. Large effect sizes (> 0.8 SD) were found for motor development and externalizing behavior. Regarding parent-child interaction, a medium intervention effect was found for non-intrusiveness, child responsiveness, and a large intervention effect for sensitivity, structuring and child involvement.

CONCLUSIONS

This pilot study showed feasibility of an additional age-appropriate intervention for very preterm born toddlers. Furthermore, promising effects were obtained indicating that additional responsive parenting support at toddler-age boosts very preterm children's cognitive, motor, and behavioral development. A larger study is required to confirm these outcomes.

ABS 40

NEONATAL HEARING SCREENING: RESULTS IN TBILISI, GEORGIA

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INTRODUCTION

The programs of newborn hearing screening are in regular usages in many advanced countries. Since 2006, the same policy operates in Georgia too. The project implies the audio-testing of all neonates born in Tbilisi, the capital town with 1,350,000 inhabitants that constitutes about 4th part of the whole state population, 4,750,000. Early detection of hearing impairments and immediate start of habilitation actions aims to prevent cognition deficits accompanying hard-of-hearing conditions. Estimation of the proper time for neonatal audio-screening was another specific target of designed studies.

PATIENTS AND METHODS

Hearing checkups of newborns were executed by screening units recognizing an induction of evoked otoacoustic emission by click stimuli applied. The prime probes were performed in all 17 maternity hospitals of Tbilisi. The controls were established under soundproof conditions in Centre of Audiology on neonates with failed initial test outcomes. When proving the failure, a middle-ear function was inspected tympanometrically, while when confirming the tympanum disorder, the respective therapy was prescribed. Under negativity of both tests, but an intact tympanum state, an objective audiometry was executed by recordings of auditory brainstem responses.

RESULTS

The quantities of consecutive audio-screening of 100,000 newborns were estimated. Hearing deficiency was verified in 1,368 cases, 1.4%. From those, middle-ear liquid was objectified in 1,008, 1.0%, and sensorineural hearing loss in remainder 360, 0.4%. Actually in all latter instances, the treated questionnaires revealed hearing risk-factors, e.g. application of ototoxic drugs, complicated delivery, rubella, low newborn weight, genetic loading. To explore the proper screening time, the test outcomes of 5 post-delivery days were measured in newborns without any hearing risk-factor. On the 1st day, the probe was positive in 19.0% of the species only. On the 2nd, 3rd, and 4th days, the passed responses amounted to 69.5%, 88.9%, and 97.8%, respectively. 100.0% was reached just on the 5th day.

CONCLUSIONS

In hearing screening testing through evoked otoacoustic emission recognition, negative responses occur in 1.4% of newborns of Tbilisi, the Eurasian city with 1,350,000 inhabitants. In 1.0% of failed cases, the hearing loss is caused by middle-ear fluids, while in remainder 0.4%, by inner-ear damages. 5th and later postnatal days appear an adequate time for the proper estimation of the hearing function in newborns via the screening approaches.

ABS 41

PROVIDING IMMEDIATE NEONATAL CARE AND RESUSCITATION AT BIRTH BESIDE THE WOMAN: CLINICIANS' VIEWS, A QUALITATIVE STUDY

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INTRODUCTION

The importance of families being present during resuscitation of both adults and children is well established. Clinicians have mixed opinions about family presence during resuscitation. Only one study has explored clinicians' experiences of newborn resuscitation at birth in front of parents and this focused only on the father's presence and found that some healthcare professionals felt uncomfortable when fathers witnessed the resuscitation. The aims of this study were to assess clinicians' views and experiences of providing immediate neonatal care at birth beside the woman, and of using a mobile trolley designed to facilitate this bedside care.

PATIENTS AND METHODS

Qualitative interview study with semi-structured interviews. Clinicians were recruited from a large UK maternity unit. Clinicians (n = 20) from a range of disciplines who were present when the trolley was used to provide neonatal care at birth at the bedside were interviewed. Five clinicians provided/observed advanced resuscitation by the bedside. Results were analysed using thematic analysis.

RESULTS

Five themes were identified: 1) Parents' involvement, which included 'Contact and involvement', 'Positive emotions for parents', and 'Staff communication'; 2) Reservations about neonatal care at birth beside the woman, which included 'Impact on clinicians' and 'Impact on parents'; 3) Practical challenges in providing neonatal care at the bedside, which included 'Cord length' and 'Caesarean section'; 4) Comparison of the trolley with usual resuscitation equipment; and 5) Training and integration of bedside care into clinical routine, which included 'Teething problems' and 'Training'.

CONCLUSIONS

Most clinicians were positive about providing immediate neonatal care at the bedside, particularly in terms of the clinicians' perceptions of the parents' experience. Clinicians also perceived that their close proximity to parents improved communication. Anxieties about performing under the close scrutiny of parents were raised. Providing immediate neonatal care and resuscitation at the bedside requires staff training and support.

ABS 42

MORTALITY AND SERIOUS MORBIDITY RATES IN OUTBORN COMPARED WITH INBORN 22-27 WEEKS' GESTATION INFANTS: A POPULATION-BASED STUDY

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INTRODUCTION

Population-based studies of outcomes of births in non-tertiary hospitals at 22-27 weeks' gestation report a significantly increased risk of infant mortality for non-tertiary ('outborn') compared with tertiary perinatal centre ('inborn') births. Our aim was to report and compare (1) infant mortality rates for all outborn and inborn livebirths, (2) infant mortality rates for all outborn and inborn livebirths admitted to a neonatal intensive care unit (NICU) and (3) rates of serious morbidity to the time of discharge home.

PATIENTS AND METHODS

A population-based cohort study of all 22-27 week livebirths, free of lethal anomalies in Victoria in 2010-2011 was conducted prospectively. The Consultative Council on Obstetric and Paediatric Mortality and Morbidity provided the denominators for all livebirths and infant deaths (including delivery room deaths). Mortality and morbidity data were sourced from the neonatal databases at the four tertiary NICUs in Victoria and from the Australian and New Zealand Neonatal Network databases following ethics approval. Outcome data for outborn compared with inborn infants admitted to a neonatal intensive care unit were analysed by logistic regression, adjusted for gestational age, birthweight and sex, and adjusted odds ratios (aOR), 95% confidence intervals (CI) and p-values calculated.

RESULTS

537 livebirths were recorded. 450 (63% of outborn and 88% of inborn livebirths) were admitted to NICU. Overall, 186 infants died: 57% outborns and 31% inborns (aOR 2.28, 95% CI 1.24 to 4.18, p = 0.008). Of the NICU admissions, 26% of outborns and 20% of inborns died, but mortality rates for outborns compared with inborns were not statistically different (aOR 1.81, 95% CI 0.86, 3.79, p = 0.117). There were no significant differences in the risk of necrotising enterocolitis (aOR 1.15, 95% CI 0.45, 2.91, p = 0.77), intraventricular haemorrhage (aOR 1.65, 95% CI 0.87, 3.13, p = 0.13), the combined outcome of death or bronchopulmonary dysplasia (aOR 1.15, 95% CI 0.57, 2.31, p = 0.69) or death or retinopathy of prematurity (aOR 1.06, 95% CI 0.55, 2.05, p = 0.86). Outborn infants had an increased risk of periventricular leukomalacia compared with inborns (aOR 5.35, 95% CI 1.83, 15.60, p = 0.002).

CONCLUSIONS

Mortality rates remained higher for all outborn livebirths at 22-27 weeks' gestation compared with inborn peers in Victoria in 2010-2011. Outborn infants admitted to NICU did not have significantly different rates of mortality or serious morbidity compared with inborns, with the exception of periventricular leukomalacia. Longer-term health consequences from outborn birth before 28 weeks' gestation need to be determined.

ABS 43

WELLBEING VERSUS BLOOD TESTING IN NEWBORNS ≥ 35 WEEKS' GESTATION WITH RISK FACTORS OF EARLY ONSET SEPSIS: A HOSPITAL-BASED STUDY

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INTRODUCTION

There is a hot debate on the differences between guidelines from the Committee on Fetus and Newborn (COFN) and that from the Centers for Disease Control and Prevention (CDC) regarding management of well-appearing newborns at increased risk for early-onset sepsis (EOS). The COFN judges wellbeing as good as or better than blood testing, thus it endorses less blood testing comparing to the CDC. Nevertheless, limited evidence supports the COFN concept. We aimed to determine prevalence of proven EOS in well-appearing newborns ≥ 35 weeks' gestation with risk factors for EOS.

PATIENTS AND METHODS

We reviewed medical records of all well-appearing newborns ≥ 35 weeks' gestation that were admitted for EOS evaluation between 2010 and 2014. Neonatal sepsis evaluation includes white blood

cell (WBC) with differential and blood culture (BC). Screened neonates are kept in well-newborn nursery for 48 hours of observation pending results of BC. Broad spectrum antibiotics are administered to newborns if WBC is < 5 x 10⁹/L, or immature to total neutrophil (IT) ratio is > 0.2, or there is more than one risk factor of EOS and the mothers did not receive adequate intrapartum antibiotics prophylaxis (IAP). Risk factors for EOS include maternal fever of ≥ 38 °C, rupture of membranes (ROM) for ≥18 hours, and maternal GBS colonization.

RESULTS

A total of 539 newborns met the inclusion criteria. Distribution of EOS risk factors were ROM ≥ 18 hours (73%), GBS maternal colonization (28%), No/inadequate IAP (30%), and maternal fever (1%). Prevalence of elevated IT ratio was 27% and decreased WBC was 0.4% while none of BCs were positive. Antibiotics were administered to 38% of newborns. A total of 440 (82%) of newborns had follow up at median (range) age of 6 (2-27) days of life. Of these, 9 newborns were symptomatic and all except one were readmitted for sepsis evaluations and treatment. All cultures were sterile except one BC grew methicillin-resistant *S. aureus* and one eye swab grew *P. aeruginosa*.

CONCLUSIONS

This study supports that neonatal wellbeing is better than blood testing for EOS evaluation in a setting with prevalent adequate IAP. Still, this concept needs to be confirmed in a large population-based study.

Quality improvement and Safety and Error Prevention

ABS 44

DECREASE OF ADMISSION HYPOTHERMIA AMONG NEWBORNS IN NICU

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INTRODUCTION

Newborns are more vulnerable to effect of thermal stress. Hypothermia in newborns is an independent risk factor for morbidity and mortality. It was noticed from the data collected between October 2012 to April 2013 that 45.4% newborns admitted to NICU had initial temperature below 36.5°C. The aim of this project was to decrease the percentage of hypothermia among NICU admissions from 45.4% to 20% by May 2014 through implementation of thermoregulation bundle.

PATIENTS AND METHODS

This study was performed at NICU of Al Rahba hospital in United Arab Emirates (UAE), from May 2013 to April 2014 and May 2014 to March 2015. All newborn infants who were admitted from delivery room or operation room to the neonatal unit were enrolled. On admission axillary temperature was measured using the digital thermometer Filac™ 3000. The primary outcome measure was axillary temperature in the World Health Organization (WHO) defined normal range (36.5-37.5°C). Body temperature less than 36.5ºC was considered as hypothermia. According WHO classification, hypothermia was defined as mild (36-36.4°C), moderate (32-35.9°C) or severe (< 32°C). We standardized the management of thermoregulation from predelivery through admission to the NICU with aim to minimize heat loss and maintain normal body temperature.

RESULTS

Admission temperature of 440 newborns were recorded from May 2013 to April 2014. The number of infants with admission temperature less than 36.5°C decreased from 45.4% to 14.9% after implementation of quality improvement project. During the second year ongoing study period, we enrolled 351 newborns. 10% of babies had admission temperature less than 36.5°C.

CONCLUSIONS

Implementation of thermal bundles decreased the occurrence of hypothermia admissions in neonates, without increasing the risk for hyperthermia. Continued efforts to eliminate hypothermia are ongoing.

ABS 45

LUNG ULTRASOUND TRAINING REDUCES RADIATION EXPOSURE IN NICU-ADMITTED PRETERM NEONATES

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INTRODUCTION

Sick preterm infants undergo a high number of diagnostic procedures during their stay in the neonatal intensive care unit (NICU). Chest X-rays forms the diagnostic mainstay for neonatal respiratory distress (RDS), but they are a source of ionizing radiation. Lung ultrasound (LUS) has a well-defined semiology validated in RDS. LUS is a quick, accessible, radiation-free technique that can easily be performed by the clinician at the patient's bedside. Since 2013, LUS has become the first-line imaging test for RDS in our NICU, with chest X-rays performed in a second step. The objective of this study was to evaluate the impact of LUS on number of chest-X rays performed and on radiation exposure.

PATIENTS AND METHODS

Information on the number of infants hospitalized, the number and cost of chest radiographs, and the number of LUS scans were retrieved from the NICU database and from hospital records for 2012 (before LUS implementation) and 2014 (after LUS implantation). Radiation dose information was calculated from the NICU's chest X-ray dosing protocol. Data were analysed with chi-square test or Fisher's exact test and $p < 0.05$ were considered to be statistically significant.

RESULTS

In 2014, 395 of 565 (69.7%) NICU-admitted preterm babies underwent one or more chest X-rays, compared with 326 of 402 (81%), in 2012 ($p < 0.001$). The total number of chest X-rays performed was 1,476 and 1,976, respectively. There were no LUS scans performed in 2012, while 312 babies underwent at least one LUS scan in 2014 ($p < 0.001$). The number of preterm neonates managed without chest X-rays in 2014 significantly rose to 30.3%, while the number of X-rays per baby were reduced by a quarter from 2012 to 2014 and mean radiation doses dropped from 180 to 60 µGy (**Fig. 1**). Reduction in X-ray use resulted in cost savings of 10,646 Euros.

CONCLUSIONS

The adoption of LUS as a first-line imaging technique for respiratory distress in our NICU resulted in a significant reduction in the number of chest x-rays performed, a quarter of the number of X-rays per infant and a three-fold decrease in radiation doses, as well as, significant cost savings. The reduction of exposure to ionizing radiation, with its potential long term
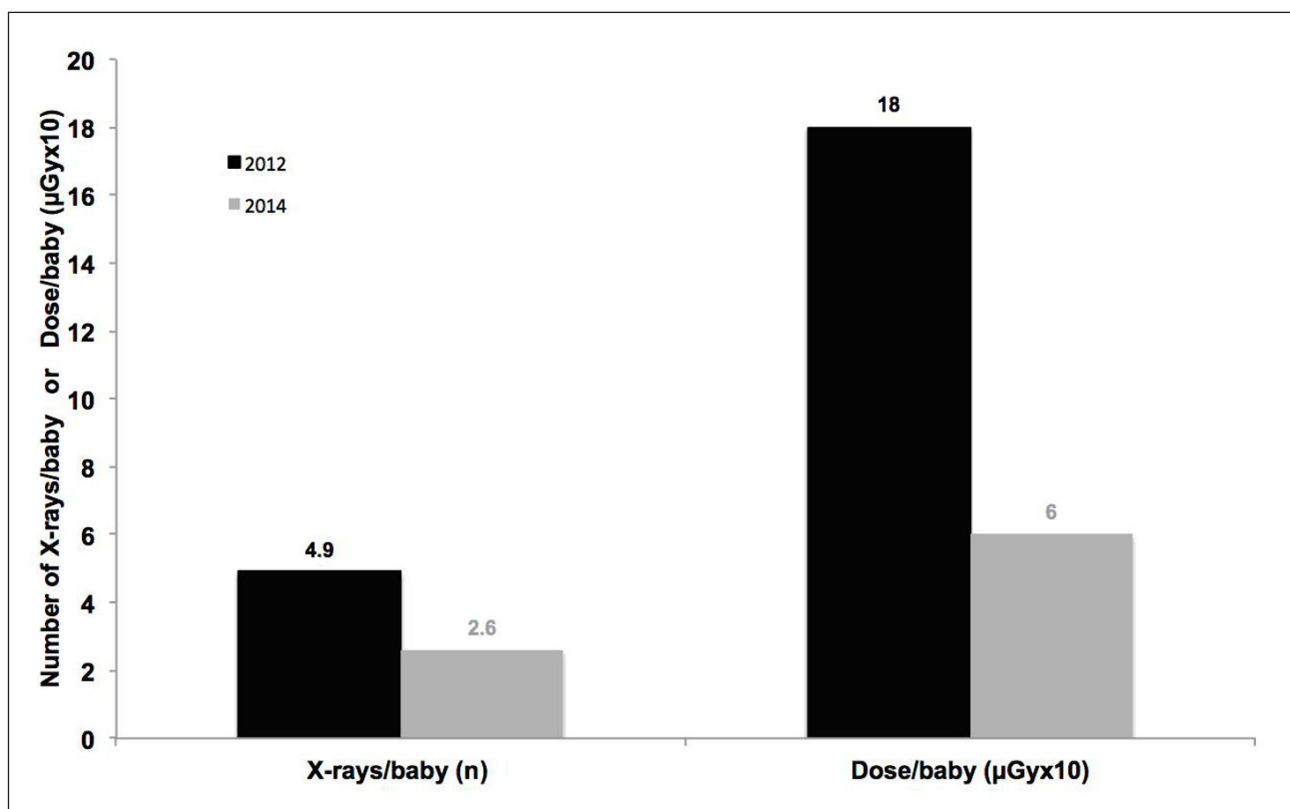

Figure 1 (ABS 45). Number of X-rays/baby and mean radiations (dose/baby) in two different years (2012 and 2014, respectively).

radiation-related health risks, may be considered an additional advantage of LUS when used in the NICU setting.

ABS 46

POST-DISCHARGE NEONATAL FOLLOW-UP OF HYPERBILIRUBINEMIA BASED ON TRANSCUTANEOUS BILIRUBINOMETRY. RELIABILITY AND EFFICACY IN TERM AND NEAR-TERM INFANTS

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OBJECTIVE
To assess the reliability and efficacy of a follow up program for neonatal hyperbilirubinemia based on transcutaneous bilirubinometry (TcB).
PATIENTS AND METHODS
This study prospectively employed TcB for screening near-term and term infants in a post-discharge jaundice follow-up clinic. TcB was measured with a Minolta JM-103 jaundice meter and values were plotted on an Israeli modification of Bhutani's hour-specific nomogram of total (TsB) serum bilirubin. If the TcB was on or above the 75th percentile, TsB was taken by heel prick. The primary outcome variable was the need for readmissions for phototherapy compared with a historical control group. Correlation coefficient between TcB and TsB was calculated for the study group only.
RESULTS
505 TcB measurements were obtained from 350 neonates. The control group consisted of 306 neonates who were evaluated by TsB only. 25% (90/350) needed TsB by heel prick (n = 128). Re-admission for phototherapy was required in 7% (25/60) in the study group and 11% (36/306) in the control group (p = 0.042). In each period there was one infant who was readmitted with severe hyperbilirubinemia (study: 21 mg%; control: 25 mg%) and both were referred because of clinical evaluation, the infant in the study group had low TcB recording. Correlation coefficient between 128 pairs of TcB\TsB was r = 0.67 (p = 0.001).
CONCLUSIONS
Screening with TcB, plotted on TsB nomograms, is safe and reliable in the setting of a post-discharge jaundice follow-up clinic.

ORAL COMMUNICATIONS

Involvement of parents in care

ABS 47

DECISION-MAKING FOR EXTREMELY PRETERM INFANTS: A SURVEY ABOUT THE ATTITUDES AND VALUES WITHIN A MULTICULTURAL SOCIETY

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INTRODUCTION
The continuous and rapid progress in neonatal medicine over the last decades has led to an increase in survival chances for extreme preterm infants. However, long-term morbidity has not decreased accordingly. The clinical course is often uncertain and unpredictable, which raises a number of ethical dilemmas regarding quality of life and medical decision-making. Studies have shown differences in attitudes and values of physicians, nurses, parents and society at large. The goal of this representative survey was to explore the attitudes and values of the Swiss population and to offer important insights on assessments of medical decision-making and quality of life for extreme preterm infants.
PATIENTS AND METHODS
An anonymous nationwide telephone survey was conducted to explore the attitudes and values towards extreme prematurity within the Swiss population with its several religions, confessions and languages. A random sample was drawn from the official Swiss telephone registry and 1,210 Swiss residents aged 18 or older were interviewed. The questionnaire entailed questions regarding ELGA infants (quality of life, medical decision-making, survival and long-term outcome) and socio-demographics. Statistical analysis was performed using IBM® SPSS® Statistics 22 (Armonk, NY, USA). The results were

weighted with regard to the three language areas to allow for nationwide generalisation of the results.

RESULTS

68% of the respondents stated they do not have a premature infant in their own family or close social environment. No significant difference existed between respondents who did or did not have personal or familial experience with extreme preterm birth. This suggests that the perspectives of the population might be close to the point of view and position parents would take in our NICUs. They stated that an acceptable quality of life of ELGA infants should imply: the conduct of an independent lifestyle (32%), being normal/like others (18%), a life without medical assistance (10%), or a life without a handicap (8%). In terms of intensive care treatment a majority (78%) of the population preferred shared decision-making between parents and professionals. In case of dissent, 65% felt that parents should have the final word in decision-making.

CONCLUSIONS

An important insight is that the shared decision making process should not be exclusively based on what could be done medically but also on a profound deliberation of the values and preferences of parents, and on the child's best interest. This study gives a better understanding how the different criteria's and values, such as quality of life (e.g. independence, normalcy) influence shared decision-making processes in daily practice.

ABS 48

EFFICACY OF SYSTEMIC FLUCONAZOLE PROPHYLAXIS IN REDUCTION OF SYSTEMIC CANDIDIASIS IN EXTREMELY LOW BIRTH-WEIGHT (ELBW) INFANTS

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INTRODUCTION

Systemic candidiasis (SC) in ELBW neonates is associated with high mortality and morbidity. Systemic prophylaxis with fluconazole is reported to be helpful in reducing the incidence of SC. The objectives of the study are to evaluate the incidence and trend in SC in ELBW neonates from 2002-2012 and to compare the incidence of systemic infection before and after the introduction of Fluconazole prophylaxis in 2009.

PATIENTS AND METHODS

The study was performed in the above neonatal centre during the period 2002-2012. The data was extracted and analysed from a prospectively maintained database for the very low birth weight (VLBW) infants. Intravenous Fluconazole prophylaxis was started in 2009 for ELBW < 800 g or babies on prolonged broad spectrum antibiotics. Epoch 1 was pre-prophylaxis era from 2002-2008 and Epoch 2 was post-prophylaxis era 2009-2012. The incidence and trends in SC and also the neonatal mortality and morbidity in the cases during the 2 epochs were compared.

RESULTS

Among the 753 ELBWs admitted during the study period, the incidence of SC was 49 (6.5%) with a significant reduction in Epoch 2 compared to Epoch 1 (2.4% vs. 9.1%, p = 0.005; odds ratio 4.07; 95% CI (1.72-10.07) and a significant trend of reduction in incidence of SC over the entire study period (p = 0.042).

The mean gestational age (26.4 vs. 26.5 wks) and birthweight (770 ± 151 vs. 799 ± 134 g) were comparable in both Epochs as was the rate of survival (Epoch 2 81% vs. 85% in Epoch 1) (p = 0.12).

Major neonatal morbidities in the SC cases were comparable in the 2 epochs including chronic lung disease, necrotising enterocolitis, severe retinopathy of prematurity, and severe intraventricular haemorrhage. No side effects related to fluconazole therapy were observed.

CONCLUSIONS

Introduction of prophylactic fluconazole in high risk ELBW infants was associated with sharp, significant reduction in the incidence of systemic candidiasis at our centre.

ABS 49

DEVELOPING COLLABORATION BETWEEN STAFF AND PARENTS IN THE NICU AT HONVED KORHAZ, BUDAPEST, HUNGARY

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INTRODUCTION

Family-centered care involves not only activities or protocols which effect parental involvement in care,

but ways to strengthen communication between staff and parents. We developed training for NICU staff (doctors, nurses, others) to watch babies with parents and learn to collaborate with parents as parents care for their babies in the NICU at Honved Korhaz (Soldier's Hospital), Budapest, Hungary. The training involves four phases: 1. behavioral observation of infants; 2. watching babies with parents; 3. understanding differences in parents and families; 4. preparation for the transition from hospital to home. The training includes lectures, demons.

CONCLUSIONS

We discuss challenges and lessons learned during the training. Recommendations are made for introducing, and carrying out the training in other NICU's in Hungary.

ABS 50

MACRO- AND MICROANALYSIS OF EARLY MOTHER-PRETERM INFANT INTERACTIONS: IMPLICATIONS FOR PREVENTIVE INTER-VENTION

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INTRODUCTION

Human development is embedded in social processes and the quality of communication with caregivers is known to influence the social, emotional, and cognitive development of young children. Preterm birth, as being traumatic for both children and their parents, is a strong risk factor for a range of mental health problems. As parent-infant relationship constitutes a mechanism that can have protective effect on child developmental outcomes, there is a need to broaden the knowledge about the specificity of parent-preterm infant interactions. Identifying development-enhancing features of those interactions may be an important element of early preventive intervention for preterm children.

PATIENTS AND METHODS

The aims of the study were 1) to explore the structure of mother-infant protoconversations, 2) to analyze vocal interactions in groups of preterm and full term 3-month-old infants (corrected age in the case of preterm infants). A total of 26 mother-preterm (G1) and 24 mother-full term infant dyads (G2) were selected from the participants of the project on self-regulatory processes (Project No. N N106 045734 financed by the Ministry of Science and Higher Education [Kmita, 2013]) (**Tab. 1**). During the home visits mothers were asked to play with their babies "as they usually do". Video recordings of parent-child interactions were made. Protodialogue episodes of 60 s duration were selected. Macroanalysis of protoconversations and microanalysis of vocal interactions were performed.

RESULTS

The macroanalysis of protoconversations as well as microanalysis of prosodic features of mother-infant vocal interactions are still in progress. Time structure analysis of vocal interactions showed that following variables differentiated the groups the most: total duration of child's interactive vocalizations ($t = -3.69$, $p < 0.001$), percentage of child vocalization time in the total time of interaction ($t = -3.47$, $p < 0.001$), and frequency of child vocalization ($t = -3.12$, $p = 0.003$). Preterms' vocalizations were shorter and less frequent in comparison to full term infants' vocalizations. The occurrence of vocal imitations was significantly higher in the G2 ($\chi^2 = 8.07$, $p < 0.01$, $\phi = 0.44$). Additionally, dichotomized variable "General emotional quality of interaction" differentiated the groups ($\chi^2 = 10.57$, $p < 0.001$, $\phi = 0.5$). More emotionally positive interactional episodes were found in G2.

CONCLUSIONS

The study results indicate that preterms show more mood disturbances and distraction during interaction with mothers. More joyful (and based on vocal imitations) vocal play was found in the group of mother-full term infants. Preliminary study results suggest that supporting preterm babies emotional regulation competencies as well as parental adjustment to the rhythm of child's vocal

Table 1 (ABS 50). Characteristic of the study sample.

Group	Gestational age (weeks)	Birth weight (g)	Girls/boys	Mother's age (years)	Mother's education (years)
Preterm babies (G1)	M = 31.1 SD = 1.8	M = 1,623.5 SD = 388.1	12/14	M = 31.4 SD = 3.8	M = 16.1 SD = 1.7
Full term babies (G2)	M = 39.5 SD = 1.2	M = 3,387.7 SD = 498.8	10/14	M = 30.1 SD = 3.4	M = 16.9 SD = 0.8

behaviours may be important elements of early intervention.

ANXIETY AND DEPRESSION IN MOTHERS AND FATHERS OF A VERY PRETERM BORN CHILD AFTER HOSPITAL DISCHARGE

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INTRODUCTION

Mothers of very preterm infants are at increased risk for anxiety and depression. Information on fathers mental health is sparse and inconclusive. However, a buffering effect of fathers has been described, in which undistressed fathers reduce the effects of maternal distress. Therefore, insight in the well-being of both the mother and the father of a very preterm child is important, in order to identify problems and offer timely support. The aim of this study was to compare the levels of anxiety and depression in mothers and fathers of very preterm born children after hospital discharge and to study which parental and child characteristics are associated with anxiety and depression.

PATIENTS AND METHODS

Participants were mothers (n = 140) and fathers (n = 93) of very preterm born children (gestational age < 32 weeks and/or birth weight < 1,500 grams). At the start of a responsive parenting intervention, anxiety and depression were assessed with the Hospital Anxiety and Depression Scale (HADS), just after hospital discharge (mean corrected age of child: 29 days). Parents completed a socio-demographic questionnaire about their age, marital status, family situation, number of children, educational level, country of birth and employment, and provided information about their child's gender, GA, and being part of a twin. Outcomes were compared to the HADS of a Dutch reference group of mothers (n = 223) and fathers (n = 161) with a similar age range (23-43), using linear and logistic regression analysis.

RESULTS

Mothers of a very preterm child who was just discharged from hospital (mean gestational age [GA]: $28^{6/7}$) scored significantly higher than the reference group on anxiety (mean 5.7 vs. 4.6, p = 0.005) and depression (mean 4.9 vs. 2.8, p < 0.001). Fathers of a very preterm child had depression and anxiety scores comparable to the reference group. The percentages of mothers in the clinical range of anxiety (33.6 vs. 17.9%) and depression (25.0 vs. 11.7%) were significantly higher than in the reference group. No differences were found for fathers in the clinical range for anxiety and depression.

In a linear regression model in mothers, GA was significantly related to anxiety (R^2 = .17) and GA and non-Dutch origin to depression (R^2 = .13). In fathers, no significant predictors for anxiety were found, but non-Dutch origin was related to depression (R^2 = 0.08).

CONCLUSIONS

Especially mothers of a very preterm child, reported high levels of anxiety and depression just after discharge from the hospital. Parents with a non-Dutch origin as well as mothers of extreme preterm children are at an even higher risk. More studies are needed to identify these specific risk groups to be able to provide optimally targeted intervention.

Miscellanea

TRANSCRIPTIONAL REGULATION OF SEX-SPECIFIC GONADAL DIFFERENTIATION INVOLVES COOPERATION BETWEEN WT1 AND GATA4 ON FOXL2 AND SOX9 EXPRESSION

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INTRODUCTION

Accumulating evidence suggests that the transcription factors WT1 and GATA4 are involved in sex determination and subsequent gonadogenesis in both sexes. Throughout these processes, WT1 and GATA4 exhibit overlapping putative downstream targets, but their functional interplay in the control of sex-specific gene expression has not been fully dissected yet.

PATIENTS AND METHODS

Using vivo-morpholino induced gene silencing in cultured murine embryonic gonads (12.5 dpc) we studied the functions of the transcription factors WT1 and GATA4 beyond the stage of sex determination by SRY.

RESULTS

In developing testes, antisense inhibition of Wt1 for 72 hours significantly down-regulated mRNA levels of testis-specific genes, i.e. Sf1, Sox9, Amh and Amhr2, respectively. In embryonic ovaries, female-regulatory genes, i.e. Dax1 and Foxl2, were reduced by Wt1 silencing vs. treatment of the contralateral gonad with mismatch vivo-morpholino. Most of the changes in gonadal gene expression that occurred upon Wt1 silencing were prevented by combined Wt1 and Gata4 antisense inhibition. Vivo-morpholino treatment identified Fst and Ctnnb1 as novel GATA4 downstream genes.

CONCLUSIONS

These findings indicate that WT1 is necessary for a sex-specific gene expression program during gonadal differentiation. The absence of FOXL2 in testis allows for the control of the transcriptional machinery by a complex interplay between WT1 and GATA4.

Neonatal Transportation

ABS 53

BACTERIOLOGICAL SAFETY IN TRANSPORT, A CONTINUOUS CHALLENGE

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INTRODUCTION

Infection is still a major health problem, especially for neonatal critical care. Ambulances disinfection, which is supposed to be efficient and very prompt, is a challenge for transportation teams. New technologies are based on biocide monomer in matrices (Certibac®) and nanoparticles bound in microstructures reacting at ambient light named photocatalysis (Bacplus®). They are very promising and supposed to be applied inside of ambulance once and their efficiency lasts at least 5 years. We wanted to clarify if these methods could reduce amount of bacteria on newly acquired ambulance surfaces.

PATIENTS AND METHODS

We performed ambulances disinfection every day with Aniosurf Premium® in old ambulances. The new ones were treated by Certibac® and Bacplus®. During 7 days in a row (December 2014 for old ambulance, march 2015 for new one) we are making bacteriological samples (Count-Tact®) at 3 keypoints 23 h after disinfection: door knob, rear seat and wall. These 3 sites were selected because handled from quite never to very often. Surface samples are 100 cm^2 at each measurement and performed by same investigator. Results are given in CFU (colony forming unit).

Statistics

Continuous variables were tested for normality and expressed as median [interquartile range]. Basic population details were compared with Mann-Whitney U-test.

RESULTS

Results are summed up in **Tab. 1**.

Concerning wall, there were low bacteria in the 2 vehicles, for rear seat there is no change. For door knob there is a trend towards CFU reduction, with a median of 80 [45-200] vs. 38 [9-68] (p = 0.14).

Table 1 (ABS 53). Results of the bacteriological samples in the ambulances.

	Wall (CFU)	Wall photocatalysed (CFU)	Rear seat (CFU)	Rear seat biocide monomer (CFU)	Door knob (CFU)	Door knob biocide monomer (CFU)
Median [interquartile range]	0 [0-1]	0 [0-7]	37 [28-47]	36 [16-42]	80 [45-200]	38 [9-68]
p	0.80		0.70		0.14	

Obviously, reduction in bacteria is most important at location frequently handled. We can ask if there is a problem with door knob day 2 sample in old ambulance, which is unrealistic. All other days have significantly better results with the new technique (p = 0.03 without this result).

A major bias is that weather was hotter for measurements in new ambulance and could help multiplication of bacteria disadvantaging new technologies and ambulances are not the same for 2 techniques.

The advantage is a more ecological approach of the problem. Photocatalysis and biocide are not compliant with film forming agents, so bio disinfection could only be provided by steam.

CONCLUSIONS

A safer environment for preterm and term newborns transfers is something essential. Even if it's just a preliminary study, this new technology is safe. Chemical products stay on the place where they were applied: there is no emission in the air.

A remaining problem is the efficiency over time and deserves a comparison at same season on more days and samples.

Organization of perinatal care

ABS 54

GUIDELINES FOR NEONATAL SURGERY IN ITALY: WORK IN PROGRESS

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INTRODUCTION

The realization of the guidelines is a tool:

• to share clinical and organizational appropriateness with a specific reference to Evidence Based Medicine;
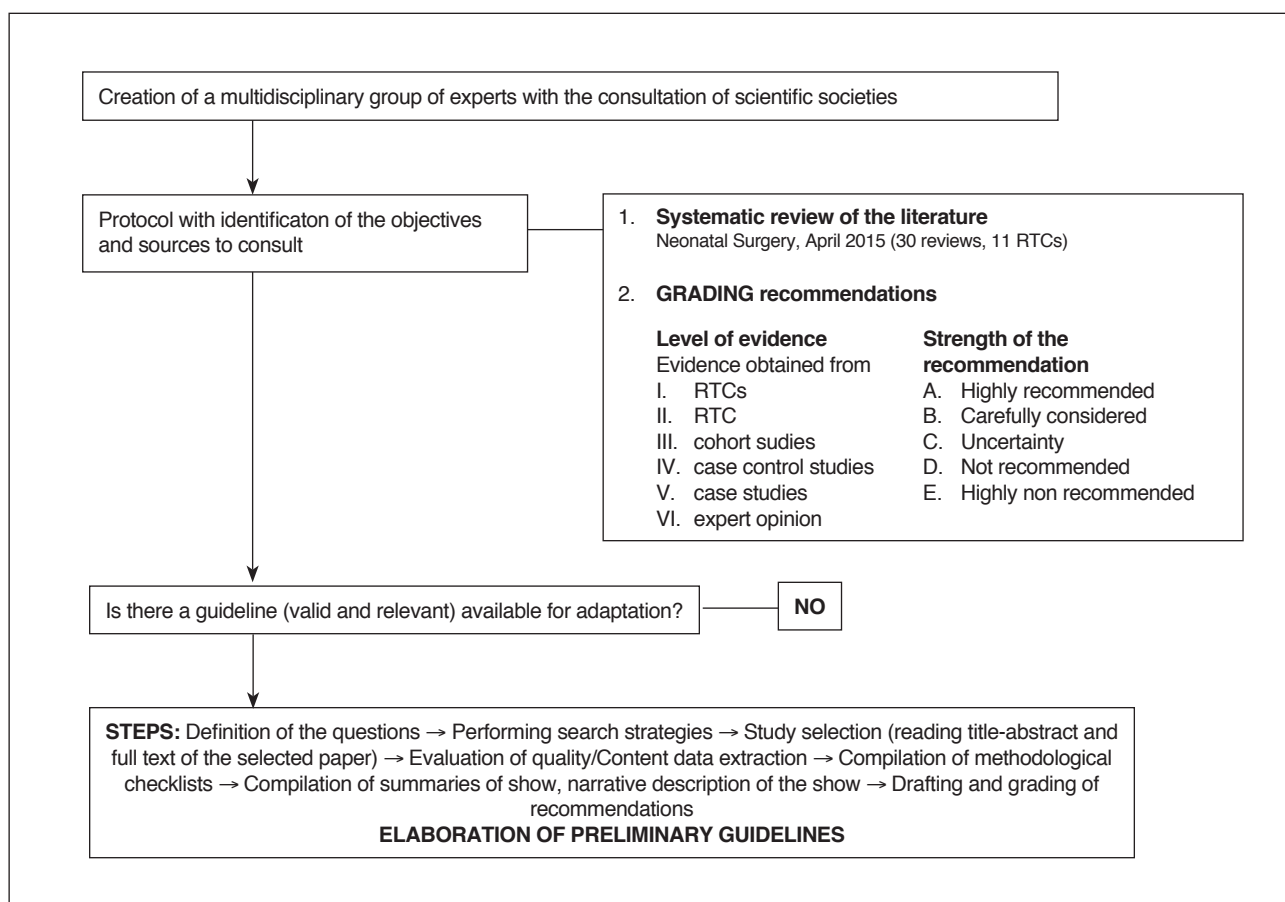

Figure 1 (ABS 54). Pathway of elaboration of guidelines.

- to ensure the depenalization of medical procedures.

These guidelines are aimed at neonatal surgery although in Italy the neonatal surgery is not among the first 10 DRGs of newborns.

PATIENTS AND METHODS

The pathway of elaboration of our guidelines has provided the stages shown in **Fig. 1**.

RESULTS

The analysis of the literature has led to the conclusion that for the Day Surgery (ambulatory surgery) are excluded newborns (age < 1 month). The children over to PCA ≥ 60 weeks, stabilized and after correction of anemia can be operated in ambulatory surgery, with a post-operative monitoring. These children can be operated only in hospitals of high specialty.

The more evidence were detected for fasting:

- preoperative fasting should be minimized, and fasting from midnight is unnecessary in most patients;
- patients can drink clear fluids and an unlimited amount of water up to 2 hours before anesthesia administration.

Postoperatively:

- generally it is unnecessary to interrupt nutrition intake after surgery.

The more evidence were detected for postoperative vomiting in newborn:

- the prophylactic antiemetic doses were recommended for newborn.

CONCLUSIONS

The pathway of guidelines led to the drafting of the intermediate document that was the subject of discussion of a consensus conference; the consensus will send new questions.

The upgrade will take place every two years, except in cases where they highlight errors, omissions, or different grading of recommendation.

Work is in progress to produce a tool to assist and guide clinical decisions.

Quality improvement and Safety and Error Prevention

ABS 55

ADOPTION OF ASEPTIC NON TOUCH TECHNIQUE IN NORTHERN IRELAND'S NEONATAL UNITS

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INTRODUCTION

Aseptic Non Touch Technique (ANTT) is well recognised in the United Kingdom (UK) as a standardised approach that is proven to reduce the incidence of healthcare-associated infection (HCAI). Infection accounts for 7.9% of neonatal deaths in the UK. The implementation of ANTT in neonatal units in Northern Ireland has been rolled out over the last three years. Under the guidance of the Cross Border Patient Safety Programme, our team have successfully adopted this policy as a culture change within our local neonatal intensive care unit (NICU) in Craigavon Area Hospital.

PATIENTS AND METHODS

The aim was to ensure 95% compliance with ANTT by all staff in NICU by February 2015. Baseline data collected in October 2014 demonstrated 81.6% compliance. We focused our objectives, with nursing staff concentrating on the administration of intravenous drugs, and medical staff implementing ANTT during intravenous cannulation. Staff undertook online e-modules, followed by face-to-face training and assessment. Compliance was encouraged by local champions, regular data measurements and staff bulletin updates. Once adopted into normal practice, the ANTT principles are transferrable to all procedures, including blood culture sampling, the results of which will have an important impact on the demonstration of the long-term benefit of this policy intervention.

RESULTS

Compliance with ANTT in our local NICU in Craigavon Area Hospital has increased steadily. Baseline data of 81.6% compliance in October 2014, improved to 96% in November and 100% compliance in December 2014. More frequent measurements in January highlighted some deficiencies in individual staff members' practice, and the areas of concern were subject to further education. The attached run chart (**Fig. 1**) documents the improvements. The long-term benefit of the introduction of ANTT is more difficult to record in smaller local neonatal units, where the number of central venous line days per patient are significantly less than in tertiary level neonatal units, but it is hoped that in time the improvement will be demonstrable in terms of reduced incidence of HCAI leading to better patient outcomes.
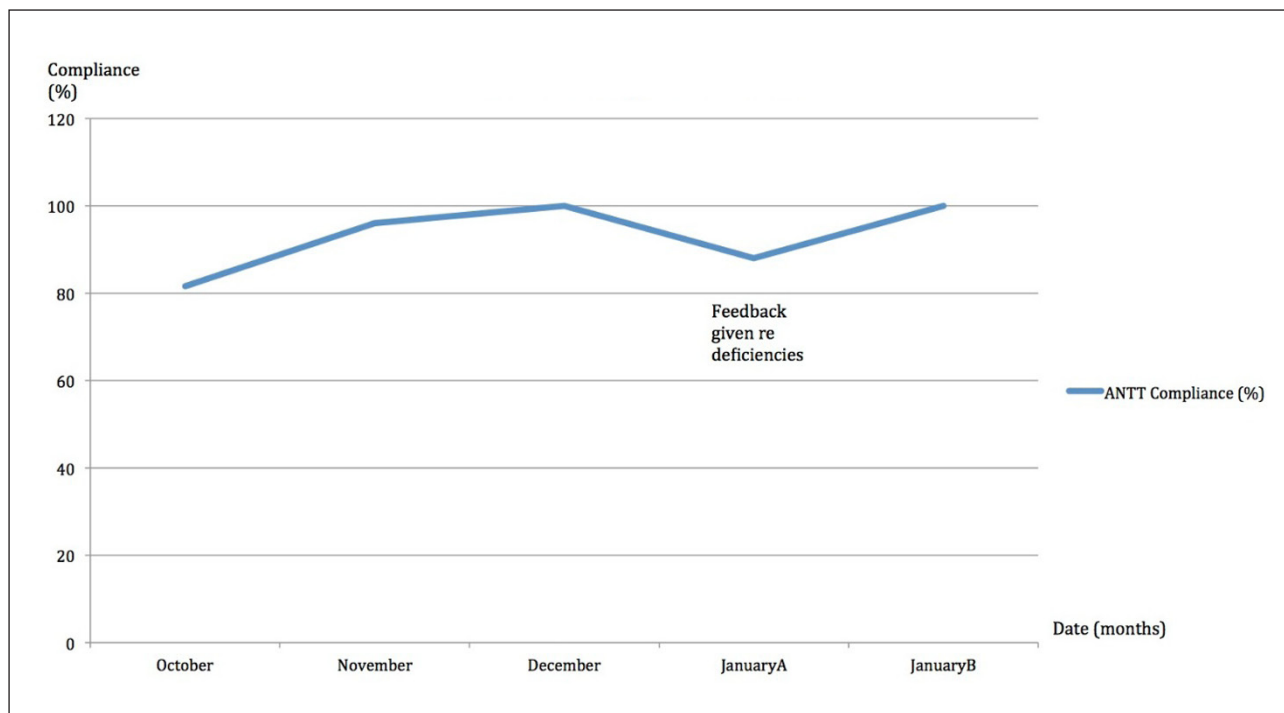
Figure 1 (ABS 55). Run chart of audit data for Aseptic Non Touch Technique (ANTT) compliance in neonatal intensive care unit (NICU).

CONCLUSIONS

ANTT methods can be readily adapted for use in all NICU procedures. They are proven to reduce the incidence of HCAI through the introduction of a standardised approach, which facilitates ongoing multi-disciplinary staff education and audit. ANTT policies should be a key focus of any neonatal team interested in quality improvement within their service, given the associations of neonatal sepsis with mortality and poor neurodevelopmental outcome.

ABS 56

INFLUENCE OF THE THECHNIQUE OF URINE SAMPLING OF URINALYSIS RESULT AND CONTAMINATION RATE IN NEONATAL PERIOD

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INTRODUCTION

We evaluated influence of the urine sampling technique on the urinalysis result and contamination rate in the neonatal period.

PATIENTS AND METHODS

Urine sampling was performed in the Well baby nursery of the Departement of Pediatrics in the University Hospital Center Osijek in newborns during sepsis and anomalies of genitourinary system workout. Eighty newborns were included in the study. During 2 separate periods of time urine samples were collected with two different techniques and newborns were divided into 2 groups, 40 newborns in each group. In the first group urine samples were collected with urine bag and sent for urinalysis and microbiological evaluation. In the second group midstream clean catch urine samples were collected with "Herreros maneuver" described by Herreros et al.

RESULTS

Urine bag sampled group showed rate of 37% abnormal urinalysis results and 42% contamination rate. In the group where urine samples were collected with "Herreros maneuver" we found 12.5% abnormal urinalysis results and contamination rate was 5%. We did not find any urinary tract infection in the newborns included in the study.

CONCLUSIONS

Abnormal urinalysis results and contamination rate were lower in the newborns where midstream clean catch urine samples were collected with

"Herreros maneuver". Further studies are needed for "Herreros maneuver" sensitivity evaluation.

ABS 57

SCREENING FOR CONGENITAL CYTOMEGALOVIRUS (CMV) INFECTION – ARE WE GETTING IT RIGHT?

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INTRODUCTION

CMV is the most common congenital viral infection, however only 10% of CMV affected infants are overtly symptomatic at presentation. Currently CMV screening is recommended based on antenatal concerns such as fetal growth restriction, hydrops, abnormal cranial ultrasound and/or postnatal concerns such as systemic infection or failed newborn hearing screen. Screening for CMV in postnatally diagnosed intrauterine growth restriction is controversial with a wide variation in practice between neonatal units. Aim of our study was to map local CMV screening pathway, compare data between 2 hospitals within the network and identify modifiable bottlenecks, thereby improving patient care.

PATIENTS AND METHODS

Retrospective, targeted data collection was performed over a period of 1 year (Jan-Dec '14) at two hospitals with similar delivery rates. The hospitals were level 2 (local) and level 3 (tertiary) neonatal centres and were within the same UK neonatal network. Neonates screened for CMV were identified from the hospital microbiology database. Demographic data along with antenatal and postnatal indications for CMV screening were identified from individual case notes. In addition documentation regarding parental communication, turnaround time for results, referral to the infectious diseases (ID) team, local and neurodevelopmental follow up was also recorded. Results were collated, compared and analysed using Microsoft® Excel® 2010.

RESULTS

Overall 50 neonates (0.5% of neonatal admissions) were screened for CMV across the 2 centres. The median gestation at birth in those screened was 39 weeks in the local unit and 28 weeks in the tertiary hospital. Screening indications varied between local and tertiary centres: IUGR (42% and 39%); failed hearing screen (17% and 0%); CNS concerns (17% and 0%), abnormal haematology (0% and 11%), prolonged jaundice (0% and 16.7%). Only 1 neonate was screened for positive maternal infection. The median delay in obtaining the results was similar in both centres (8 and 6 days). Almost all had urine CMV (88%), while the rest had buccal or serology. Only 3 infants (10.3%) had positive CMV, of which 1 had neurological manifestations. There was poor documentation regarding parental communication, pre and post screening.

CONCLUSIONS

The incidence of congenital CMV in our cohort was 0.06%, which is within the reported incidence for developed countries. All infants screened for IUGR and prolonged jaundice had a negative CMV screen. There was a significant variation in screening thresholds within the same neonatal network. Our findings suggest an urgent need for development of evidence based CMV screening guidelines and parent information leaflets across the neonatal network.