



ABSTRACTS COLLECTION

4th Congress of Joint European Neonatal Societies: Epidemiology

Pediatric Research (2021) 90:16–20; <https://doi.org/10.1038/s41390-021-01759-1>

Date: 14–18 September 2021

Location: Virtual Meeting

Sponsorship: Publication of this supplement was sponsored by MCA Events on behalf of the European Society of Paediatric Radiology (ESPR), Union of European Neonatal and Perinatal Societies (UENPS), European Foundation for the Care of Newborn Infants (EFCNI).

All content was reviewed and selected by the Scientific Committee and selected abstract reviewers, which held full responsibility for the abstract selections.

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ID 10. Meningitis trends and association with intraventricular hemorrhage in very preterm infants

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Background: Meningitis is often considered to be a subset of neonatal infections that should respond to infection control strategies; however, a preliminary report from the Canadian Neonatal Network (CNN) indicated that an infection control program decreased late onset sepsis but not meningitis. There was also no significant decrease in the incidence of severe neurological injury. We aimed to compare trends in the incidence of late onset sepsis and meningitis among very preterm infants in Canada, and to determine whether there is an association between late onset meningitis and intraventricular hemorrhage (IVH).

Methods: All very preterm infants <33 weeks gestational age admitted to tertiary level neonatal intensive care units (NICUs) in the CNN from 2010–2018 were included. Statistical analyses were performed to compare the trends for incidence rates of late onset culture positive bloodstream infection (CPBSI) and late onset meningitis, and to examine the association of meningitis and IVH (exposure), after adjustment for patient risks.

Results: Of 36,573 infants in this study, 32,198 had no infections, 3977 had only late onset CPBSI and 398 had late onset meningitis. Between 2010 and 2018, there was a significant decrease in the incidence of late onset CPBSI (rates decreased from 14% to 11%; AOR) = 0.93; 95% CI 0.92, 0.95) but not for late onset meningitis (rates were not significantly changed from 1.5% to 1.2%; AOR) = 0.98; 95% CI 0.94, 1.01). Infants with IVH grade 3 or above had higher odds of late onset meningitis compared with infants with no infection (AOR 4.16; 95% CI 3.17, 5.44), and infants with late onset CPBSI (AOR 4.11; 95% CI 3.08, 5.50).

Conclusion: There was a decreasing trend of late onset CPBSI but not meningitis. An association between late onset meningitis and IVH was observed. Late onset CPBSI and meningitis may have different risk factors and require different prevention strategies.

	Infection category		
	AOR (95% CI): late onset CPBSI vs no infection	AOR (95% CI): late onset meningitis vs no infection	AOR (95% CI): late onset meningitis vs late onset CPBSI
IVH (grade 1 or 2)	1.25 (1.14, 1.37)*	1.25 (0.98, 1.59)	1.00 (0.78, 1.28)
IVH (grade 3 or above)	1.01 (0.87, 1.17)	4.16 (3.17, 5.44)*	4.11 (3.08, 5.50)*
Sensitivity analysis^a			
IVH (grade 1 or 2)	1.25 (1.15, 1.37)*	1.39 (1.07, 1.81)*	1.11 (0.85, 1.46)
IVH (grade 3 or above)	0.98 (0.84, 1.14)	2.92 (2.11, 4.04)*	3.00 (2.13, 4.22)*

(ID 10) -AOR adjusted odds ratio, CI confidence interval, CPBSI culture positive bloodstream infection, IVH intraventricular hemorrhage. ^aSensitivity analyses were conducted omitting infants who had meningitis occurring within 7 days of life or who had cerebrospinal fluid shunt or reservoir procedures. *p < 0.05.

Multinomial logistic regression showing associations of intraventricular hemorrhage and infection categories.

None declared.

ID 75. 10-year results from the German Retina.net ROP registry and extension into the EU-ROP registry

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Background: Treatment-requiring retinopathy of prematurity (ROP) is a rare disease with considerable impact on affected infants and their families. In Germany, the non-interventional Retina.net ROP registry was launched in 2011 with the aim to improve our knowledge of demographic parameters, treatment patterns and outcomes. The current analysis presents some key parameters from the registry data of children born between 2011 and 2020.

Methods: This registry study analyzes changes in demographic parameters and ROP treatment patterns over the observed 10-year period. In addition, we provide an outlook on the newly-created EU-ROP registry which will allow expansion of the registry in other European countries.

Results: A total of 353 infants (691 eyes) from 19 centers were treated for ROP and documented in the registry. Mean gestational age was 25.3 weeks (±1.8) and birth weight 691 g (±223). The average postmenstrual age at treatment was 37.7 weeks (±3.2) and mean postnatal age 12.4 weeks (±3.1). Mean weight at treatment was 2310 g (±746), with weight gain from birth to treatment averaging 19 g per day (±6.2). Demographic parameters remained stable over the 10 years analyzed. However, treatment patterns changed considerably over time. While in 2011 anti-VEGF treatments accounted for only 14% of all treatments, anti-VEGF treatment was given in 61% of treated ROP cases in 2020. While bevacizumab was predominantly used for anti-VEGF therapy from 2011 to 2018, all but two documented anti-VEGF treatments in 2019 and all anti-VEGF treatments in 2020 were performed with ranibizumab.

Conclusion: To our knowledge this is, next to the Swedish SWEDROP, the longest period of real-life data on treated ROP studied so far. Over this 10-year period, we observed a major change in the treatment approaches used. While laser treatment rates declined, anti-VEGF treatments increased significantly. Following the approval of ranibizumab for ROP in 2019, all anti-VEGF treatments in the registry were performed with ranibizumab. These results may be representative for Germany but do not reflect treatment patterns in other countries. To address this situation, we are currently working on opening the registry for other countries. For reference please see www.eu-rop.org.

The authors received speaker fees and research grants, participated in advisory board meetings and clinical trials from: Alimera Sciences, Allergan, Bayer, Heidelberg Engineering, Novartis, Roche related and unrelated to topic.

ID 231. High rate of visual impairment and associated neurological disorders in children born before 24 weeks gestation

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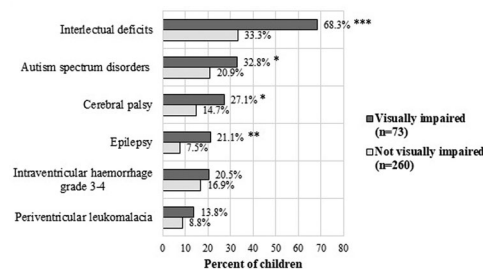
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Background: Infants born extremely preterm have a high risk of neurological disorders including visual impairment. We aimed to investigate long-term ophthalmological and neurological outcomes for infants born before 24 weeks' gestational age (GA).

Methods: A retrospective nation-based study of infants born before 24 weeks' GA with completed screening for retinopathy of prematurity (ROP) 2007 to 2018 was conducted. ROP data were retrieved from the Swedish patient registry for ROP, SWEDROP. Ophthalmological outcomes, such as visual acuity, refractive errors, manifest strabismus and nystagmus, birth characteristics, neonatal morbidities, and neurological outcomes were retrieved from the medical records.

Results: Ophthalmological outcomes were assessed in 355 children, median GA 23+2 weeks and median birth weight 565 g. The median age at the last ophthalmological examination was 4.8 years (range 0.5–13.2 years). There was wide variability in the frequency of ophthalmologic follow-up and type of recorded data. Nystagmus was recorded in 21.1% (44/209), strabismus in 34.8% (109/313) and 51.0% (154/302) wore spectacles. Altogether 67.3% (239/355) had ocular and/or visual problems requiring ophthalmological follow-up. Out of 333 children, 73 (21.9%) were categorized as visually impaired (referred to a low vision clinic at any age and/or having a visual acuity less than 20/60 at 3.5 years of age or older). Neurological deficits such as intellectual disability (63.8% versus 33.3%, $p < 0.001$), epilepsy (21.1% versus 7.5%, $p = 0.001$), cerebral palsy (27.1% versus 14.7%, $p = 0.016$) and autism spectrum disorders (32.8% versus 20.9%, $p = 0.043$) were more frequent in visually impaired children than in those not visually impaired. Ophthalmological and/or neurological deficits known to associate with cerebral visual impairment (CVI) were reported in 74.6% (265/355) of the children. Nine children were diagnosed with CVI.

Conclusion: A high proportion of the children born before 24 weeks GA were visually impaired and the majority had ophthalmological problems requiring follow-up. Neurological deficits were more frequent in visually impaired children than those without visual impairment. CVI investigation was rarely considered although associated ophthalmological and neurological deficits were present, suggesting potential underdiagnosis of this condition. National follow-up guidelines need to be instituted and resources allocated to identify difficulties in these vulnerable children presenting with multiple ophthalmological and neurological disorders.



(ID 231) - Fig. 1. Percent of children with neurological deficits and visually impaired (n = 73) or not (n = 260). *** $p < 0.001$, ** $p < 0.01$. * $p < 0.05$.

None declared.

ID 234. Male disadvantage in short-term complications of prematurity: a systematic review and meta-analysis

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Background: A widely accepted concept in perinatal medicine is that boys are more susceptible than girls to adverse outcomes of prematurity, including bronchopulmonary dysplasia (BPD), retinopathy of prematurity (ROP), necrotizing enterocolitis (NEC), intraventricular hemorrhage (IVH), and periventricular leukomalacia (PVL). However, this male disadvantage of prematurity has not been systematically analyzed. We conducted a systematic review and meta-analysis of clinical studies exploring the association between sex and short-term complications of prematurity.

Methods: Prospero registration number: CRD42018095509. PubMed and Embase were searched. We selected cohort studies examining preterm infants and reporting primary data on the association between infant sex (independent variable) and the development of BPD, ROP, NEC, IVH and PVL. Differences in obstetric and perinatal characteristics were also analyzed. A random-effects model was used to calculate risk ratios (RR) and 95% confidence interval (CI).

Results: Of 2654 potentially relevant studies, 41 met the inclusion criteria (579,872 infants). Male sex was associated with a decreased risk of hypertensive disorders of pregnancy (RR 0.83, CI 0.80–0.86), fetal distress (RR 0.78, CI 0.68–0.9), and c-section (RR 0.98, CI 0.97–0.99), but an increased risk of birth in a non-tertiary hospital (RR 1.08, CI 1.03–1.13), intubation at birth (RR 1.04, CI 1.01–1.08), respiratory distress syndrome (RR 1.09, CI 1.04–1.14), surfactant use (RR 1.06, CI 1.03–1.08), pneumothorax (RR 1.24, CI 1.11–1.40), postnatal steroids (RR 1.21, CI 1.19–1.24), late onset sepsis (RR 1.05, CI 1.03–1.08), any NEC (RR 1.15, CI 1.03–1.27), NEC>stage 1 (RR 1.12, CI 1.06–1.18), any IVH (RR 1.17, CI 1.14–1.19), severe IVH (RR 1.28, CI 1.22–1.34), severe IVH or PVL (RR 1.17, CI 1.04–1.31), any BPD (RR 1.20, CI 1.05–1.37), moderate/severe BPD (RR 1.23, CI 1.18–1.27), severe ROP (RR 1.14, CI 1.07–1.22), and mortality (RR 1.23, CI 1.16–1.30).

Conclusion: This meta-analysis confirms the presence of male disadvantage in mortality and short-term complications of prematurity including IVH, BPD, ROP, and NEC. Our data also suggest that preterm boys have higher clinical instability and greater need for aggressive interventions than preterm girls. These differences in clinical course may have a major influence on the development of the pulmonary, neurological, ocular, and gastrointestinal complications of prematurity.

None declared.

ID 282. One-year survival of infants born at 22 and 23 weeks' gestation: a comparison of 3 Swedish national birth EPOCHS, 2004–2007, 2014–16 and 2017–2019

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Background: Data reported during the past two decades indicate that rates of survival have increased among infants born at the borderline of viability but data from most recent years are lacking.

Objective: We compared one-year survival, and rates of survival without major neonatal morbidities (namely, severe bronchopulmonary dysplasia, intraventricular-hemorrhage grade 3–4, periventricular-leukomalacia, severe retinopathy of prematurity [stage 3–5], and necrotizing-enterocolitis) of infants born at 22–23 weeks of gestation—altogether 979 infants—across three birth epochs, 2004–2007 (epoch1), 2014–2016 (epoch2) and 2017–2019 (epoch3) after national recommendations and guidelines were implemented in whole of Sweden.

Methods: Prospective data collection was used during epoch1. During epoch2 and epoch3 data were obtained from Swedish medical birth and neonatal quality registers. Logistic regression analyses examined the associations with obstetric and neonatal interventions.

Results: During epoch1, 323 births (live births and stillbirths) occurred at 22–23 weeks' gestation compared with 345 births in Epoch2 and 312 births in Epoch3 ($P = 0.5$). One-year survival among live-born infants at 22 weeks gestational age was significantly lower in Epoch1 [5/49 (9.8%)] compared with epoch2 ([29/74 (39%)], and epoch3 [31/80 (39%)], $P = 0.002$). One-year survival at 23 weeks gestational age was not significantly different in the 3 epochs [epoch1, 53/101 (52%); epoch2, 91/148 (61%) and epoch3, 76/115 (66%)], $P = 0.08$. Survival without major neonatal morbidity at 22 weeks gestational age was 20%, 17%, and 19% in epochs 1, 2, and 3, respectively ($P = 0.9$). The corresponding proportions in infants born at 23 weeks' gestation were 17%, 25%, and 25% ($P = 0.5$). Multivariable logistic regression analyses of all 569 live births at 22–23 weeks gestations revealed that centralization (born at tertiary center), antenatal corticosteroids (ANCS), and surfactant administration at <2h of life were associated with 1-year survival (adjusted odds ratios, 1.7, 95% confidence interval [CI], 1.1 to 2.9; 2.5 [95% CI, 1.4 to 4.3] and 2.9 [95% CI, 1.9 to 4.5], respectively).

Conclusion: Survival among live births at 22 weeks increased by 4-fold in 2014–16 or 2017–2019 compared with 2004–2007. Survival without major neonatal morbidity did not differ in the three epochs. Centralization of all deliveries at 22–23 weeks, ANCS, and surfactant administration were associated with survival.

The authors have no conflict of interest.

ID 329. What gestational age and birthweight inclusion criteria should be used in selecting studies for meta-analyses of very preterm birth and cognition?

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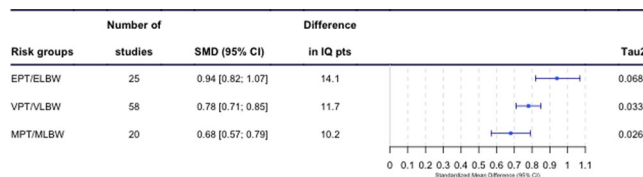
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Background: Meta-analyses synthesizing the results of studies on very preterm (VPT) birth and childhood cognition have increased in recent years. Some reviews restrict primary studies to those using gestational age (GA) inclusion criteria, while others include birthweight (BW) criteria. This creates a lack of overlap in studies included in reviews which could lead to conflicting results and represent a missed opportunity to analyze all available information. We described the GA and BW criteria in studies on VPT birth and cognition and whether results differed based on these criteria.

Methods: All primary studies used in five systematic reviews investigating the consequences of VPT birth on childhood IQ were included. Country, birth years, and BW/GA selection criteria for VPT were extracted from each study. When several studies were from the same cohort, we selected the study with the longest follow-up (103 unique cohorts out of a total of 156 studies). Pooled standardized mean difference (SMD) in IQ between VPT and full-term were estimated with sub-groups defined by GA/BW criteria to investigate variation in effect sizes. We distinguished between three risk groups: extremely (E)PT (<28 weeks(w)) and ELBW (<1000 grams (g))(k=25); very (V)PT (<32w) and VLBW (<1500 g) (k=58); moderately (M)PT (<34w) and MLBW (<1800 g) (k = 20).

Results: There was a high heterogeneity in GA/BW study criteria in studies included in the meta-analyses. Most common criteria were BW<1000 g (12), BW<1500 g (24), GA<32 w (12) and GA<33 w (12); other combinations of BW/GA represented 23 studies. Studies using BW only criteria were more often from North America than Europe (56% vs 24%), and included children born before 1990 compared to more recent cohorts (67% vs 26%). Estimates of the magnitude of the impact of VPT on cognition within risk groups did not differ significantly by BW or GA criteria, although pooled-SMD using BW criteria were larger. Significant differences in the IQ deficit associated with prematurity were noted across risk groups (Figure).

Conclusion: Meta-analyses on the consequences of VPT birth should include studies using GA as well as BW criteria to avoid selection biases associated with country of origin and year of birth and to increase the potential for investigating trends across time and risk group.



(ID 329) - Forest plot of standardized mean differences (SMD) in IQ between very preterm children and full-term children, by degree of prematurity

None declared.

ID 336. Socio-demographic patterns of refugee neonates admitted to a neonatal intensive care unit and high dependency unit during a 4-year refugee crisis period in Greece

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Background: During Greece migration crisis, adverse effects on neonatal health status have been reported. The aim of our study was to examine the socio-demographic characteristics of refugee neonates admitted to advanced neonatal care units.

Methods: All refugee neonates admitted to B' Neonatal Intensive Care Unit (NICU) and Neonatal High Dependency Unit (NHDU) during a 4-year period were retrospectively analyzed. Socio-demographic characteristics, living and housing conditions, along with neonatal characteristics and mortality were analyzed.

Results: A total of 77 refugee neonates were admitted to B' Neonatal Intensive Care Unit (NICU) (n = 58; 75.3%) and Neonatal High Dependency Unit (NHDU) (n = 19; 24.7%) from January 2017 to December 2020. Among them, 46 (60%) were males, with a mean gestational age of 35 ± 4.3 weeks, mean birth weight of 2467 ± 911.3 g and mean age of 7 ± 11.2 days at hospital admission, while 61% of the neonates were admitted during the first day of life. Premature infants were 41 (53.2%), while almost three out of four neonates (74%) were admitted due to respiratory distress or infection. Among the refugee neonates, 49 (63.6%) were born in Athens and 17 (22.1%) were transferred from the islands of Chios, Kos, Mytilene and Samos. Low or unknown parental educational level without health insurance was recorded in almost 90%, while unemployment or unknown working status was detected in 78% of our sample. Living in refugee camps was reported in 44%, while tenancy sponsored by non-governmental organizations was detected in 18%. More than one out of four neonates, were born in families with more than four children. No access to antenatal care was detected in 57 (78%) of our neonates, while among premature neonates 19 (50%) did not receive antenatal steroids. During hospitalization, 8 (10.4%) of the refugee neonates died. A total 46 (83%) missed the follow-up during the first 3 months, while this figure increased to 52 (94%), 53 (96%) and 54 (98%) during the next 6 months, 1 year and 3 years, respectively.

Conclusion: Poor socio-economic conditions have been found among refugees who sought advanced neonatal care. This may be related to the low antenatal follow-up rates among refugee mothers.

No conflict of interest.

ID 400. Centralization of care does not exclusively explain the improved outcome in extremely preterm infants in Sweden

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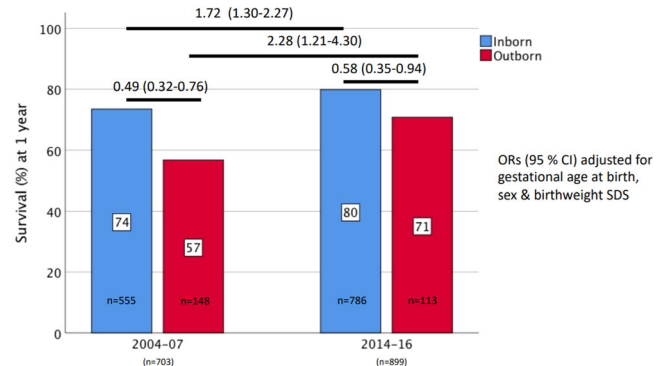
Background: A comparison of two Swedish population-based cohorts of live-born infants delivered at 22–26 weeks of gestation during two 3-year periods, ten years apart, showed that an increased survival to 1 year of age in the later cohort was paralleled by an increasing proportion of extremely preterm births taking place at hospitals with level III neonatal intensive care units (1). We hypothesized that the increased centralization of births in the later period was the major explanation for the overall increase in infant survival.

Methods: Data was retrieved from two population-based study databases, covering all Swedish births at 22+0 to 26+6 weeks of gestation during 2004–2007 and 2014–2016. Data from 1602 live-born infants were analyzed by birth at (inborn) or outside (outborn) hospitals with level III neonatal intensive care, and by birth cohort. The primary outcome was 1-year survival among live-born infants.

Results: Survival at 1 year (%) among live-born according to birth cohort and inborn/outborn status is shown in Fig. 1. Comparisons of infant survival rates are expressed by odds ratios (OR) with 95% confidence intervals (CI) adjusted for gestational age at birth, sex and birthweight standard deviation score. Outborn status was associated with a lower adjusted 1-year survival within both time periods. Further, adjusted 1-year survival was significantly higher in 2014–2016 than in 2004–2007, irrespective of inborn/outborn status. The 2014–2016 birth cohort remained significantly associated with a higher 1-year survival also after adjustment for inborn/outborn status, OR = 2.0 (95% CI: 1.1–3.6). The association between inborn/outborn status and 1-year survival was no longer statistically significant after adjustment for antenatal steroid treatment.

Conclusion: The higher 1-year survival rate observed in 2014–2016 as compared to 2004–2007 was not exclusively explained by an increased centralization of births. Of note, infant mortality decreased over time in both inborn as well as in outborn infants suggesting an increasingly active attitude towards management of extremely preterm births even outside hospitals with level III neonatal intensive care units.

(1) Norman, M., Hallberg, B. & Abrahamsson, T. et al. Association between year of birth and 1-year survival among extremely preterm infants in Sweden during 2004–2007 and 2014–2016. *JAMA* 321, 1188–1199 (2019).



(ID 400) - Survival (%) at 1 year of age in live-born infants according to birth cohort and inborn/outborn status

None of the authors have any conflicts of interest to declare.

ID 430. Wellbeing of mothers of 5-year-old children born very preterm: prevalence and influential factors in a European COHORT (SHIPS)

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Background: Mothers of very preterm (VPT) children may experience psychological symptoms like depression or anxiety, especially during the early postnatal period. This stress may continue after discharge from the neonatal unit and compromise wellbeing. This study describes the emotional wellbeing of mothers of 5-year-old children born VPT in a European cohort. We assessed whether medical conditions during pregnancy, socioeconomic status and the child's health at 5 years influenced maternal wellbeing.

Methods: Data come from the prospective European multiregional "Effective Perinatal Intensive Care in Europe" (EPICE) and subsequent "Screening for Health in Very Preterm infantS in Europe" (SHIPS) projects which included all births <32 weeks of gestation from 19 regions in 11 countries (7900 live births). Perinatal data on maternal characteristics, pregnancy complications, birth and neonatal course were abstracted from medical records in obstetric and neonatal units. Between 5 and 6 years of age, follow-up was based on a parent-report questionnaire, which included the Five Item Mental Health Inventory (MHI-5). MHI-5 scores range from a maximum at 100 (high wellbeing) and a minimum of 0. At 5 years of age 6759 infants were eligible; 3687 participated in the follow up. Descriptive statistics as well as a multi-level multivariate linear regression analysis with adjustment for country were used. Inverse probability weighting (IPW) was used to minimise attrition bias.

Results: Among the 2588 mothers who completed the MHI-5, the overall mean score was 70.8 (SD 17.1) with a variation among participating countries from 83.4 (SD 14.7; The Netherlands) to 63.5 (SD 16.9; Poland). MHI-5 scores were significantly lower for mothers with 2 or more previous births, with at least one parent unemployed, being retired or on sick leave and when the child suffered from any severe neonatal morbidity at discharge from NICU. At 5 years of age vision impairment was associated with lower maternal MHI-5 score.

Conclusions: Wellbeing of mothers of VPT children differs between European countries. Maternal socioeconomic characteristics as well as severe morbidity of VPT children affect maternal wellbeing. This study may help to identify groups of mothers who need special assistance to cope with VPT birth.

No conflict of interest.

Funding: This study has received funding from the EU Horizon 2020 program under grant agreement no 733280.

ID 450. Micro-premature infants (<25 weeks GA) in New Jersey show improved mortality and morbidity from 2000–2018

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Background: Micro-premature newborns, gestational age (GA) <25 weeks, have high rates of mortality and morbidity. Literature has shown improving outcomes for extremely low gestational age newborns (ELGANs) GA <29 weeks, but few studies have addressed outcomes of ELGANs <25 weeks.

Objective: To evaluate the trends in outcomes for ELGANs born in New Jersey, from 2000 to 2018 and to compare two subgroups: GA 23 to 25 weeks (E1) and GA 26 to 29 weeks (E2).

Design/Methods: Thirteen NICUs who participate in the NJ NICU Collaborative submitted de-identified data on ELGANs of GA 23–29 weeks to a central depository for the period 2000–2018. To ensure standardization we utilized the data submitted annually by each center to the Vermont Oxford Network. We excluded all out-born infants and those with major congenital anomalies. Outcomes for mortality and seven major morbidities were calculated. Linear regression analyses were performed for each measure to obtain rates of change over the 19 years. Correlation coefficients were tested for statistical significance.

Results: Data from 12,707 infants comprised the majority of ELGANs born in NJ from 2000 to 2018. There were 3957 in the E1 group and 8750 in the E2 group. Mortality decreased significantly in both groups; E1, 43.2% to 30.2% and E2, 7.6% to 4.5% over the 19 years. The decline in E1 was significantly greater than in E2. Most morbidities also showed significant improvement over time in both groups. Survival without morbidity increased from 14.5% to 30.7% in E1s and 47.2% to 69.9% in E2s (Table 1).

Conclusion(s): Significant declines in both mortality and morbidity have occurred in ELGANs over the last two decades. The rates of improvement for the more immature ELGANs of GA 230 to 256 weeks were greater than for the more mature group in several outcomes. While the rates of morbidity and mortality remain high, these results validate current efforts to support the micro-premature newborn.

Table
ELGAN MORBIDITY AND MORTALITY 2000 - 2018

	E1 (23 ^a - 25 ^a weeks)				E2 (26 ^a - 29 ^a weeks)				E1 - E2						
	2000 ^b	slope ^c	2018 ^b	r	p	2000 ^b	slope ^c	2018 ^b	r	p	2000 ^b	slope ^c	2018 ^b	r	p
mortality	43.2	-0.72	30.2	0.71	<0.001	7.6	-0.17	4.5	0.53	0.020	35.6	-0.55	25.7	0.61	0.008
morbidity in all patients	90.1	-0.83	75.2	0.64	<0.001	55.5	-1.29	32.3	0.93	<0.001	34.6	+0.46	42.9	0.77	<0.001
survival with no morbidity ^d	14.5	+0.9	30.7	0.82	<0.001	47.2	+1.26	69.9	0.94	<0.001	-32.7	-0.36	-39.2	0.56	0.013
INDIVIDUAL MORBIDITIES (PERCENTAGE OF ALL PATIENTS EVALUATED FOR THE MORBIDITY)															
CLD	58.5	-0.52	49.1	0.53	0.020	22.3	-0.33	16.4	0.61	0.006	36.1	-0.20	32.5	0.23	0.34
LI	49.2	-1.33	25.3	0.87	<0.001	29.6	-1.23	7.5	0.94	<0.001	19.6	-0.10	17.8	0.17	0.49
ivH	25.4	-0.41	18.0	0.52	0.022	7.6	-0.15	4.9	0.50	0.029	17.8	-0.27	12.9	0.37	0.12
uROP	28.9	-0.84	13.5	0.81	<0.001	6.0	-0.24	1.7	0.85	<0.001	22.7	-0.61	11.7	0.71	<0.001
PnT	11.1	-0.08	9.6	0.20	0.41	4.7	-0.10	2.9	0.50	0.029	6.5	+0.02	6.9	0.05	0.84
NEC	10.9	-0.09	9.3	0.28	0.25	7.6	-0.20	4.0	0.75	<0.001	3.4	+0.11	5.4	0.37	0.12
PVL	4.3	+0.03	4.8	0.09	0.71	3.0	-0.05	2.1	0.38	0.11	1.3	+0.08	2.7	0.25	0.30

^a % in 2000 estimated from y-intercept from linear regression
^b % change/year
^c % in 2018 estimated from y-intercept from linear regression + 18 x slope
^d % increase in percentage from 2000 to 2018 is an improvement

(ID 450) - Table 1 ELGAN morbidity/mortality comparisons

None declared.

ID 522. Developmental coordination disorder and quality of life in school-age very preterm children

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Background: Developmental Coordination Disorder (DCD) is a motor disorder of unknown etiology that affects with higher frequency males and preterm children. Onset is in early childhood, with difficulties in the acquisition of motor skills such as riding a bicycle, use of common tools, drawing and handwriting, leading to disadvantage in several areas of the school curriculum, home tasks and leisure/recreational activities. We aimed at assessing quality of life (QoL), as reported by the children themselves, in a prospective very preterm cohort.

Methods: The data come from a area-based follow-up study (ACTION) carried out in three Italian regions. Overall, 804 (response rate 73.4%) children were assessed at school age (mean 9 years, range 8–11). We used the PedsQL™ 4.0, children version, to measure QoL, and the parent-report questionnaire (DCDQ-IT) as screening tool for motor problems. Consistently with the DCD definition, we excluded children with cognitive deficit (<70), cerebral palsy, blindness and other impairments affecting movement. As PedsQL was used in two regions only, 403 children were analyzed. Multiple linear regression was carried out to adjust for potential confounders.

Results: Over half of the children (221, 54.8%) were males, and 78 (19.3%) were born <28 week of gestational age (GA). 27.0% were multiples. 130 children (32.3%) had a DCDQ score <15th centile, indicating increased risk for DCD. The total PedsQL score (Table) was 75.6 for children at increased DCD risk and 80.2 for their peers (p<0.01). Similar differences were observed for the other subscales except Emotional Functioning.

The difference in QoL between children at risk and not at risk for DCD remained statistically significant (p<0.016) after adjustment for gender, GA, small for GA, child cognition, neonatal morbidities and maternal socio-demographic factors.

Conclusions: DCD can significantly impair a child QoL, which may have long-term consequences into adulthood. Early diagnosis is important for timely interventions to improve educational and social outcomes including QoL.

PEDS QL scales	Probably not DCD (n. 273)	Increased risk of DCD (n. 130)
	Mean (sd)	Mean (sd)
Physical Health Score	81.2 (13.4)	75.0 (15.7)
Emotional Functioning scale	76.0 (19.1)	76.3 (19.0)
Social Functioning scale	85.3 (17.4)	80.8 (17.7)
School Functioning scale	77.7 (16.6)	70.5 (19.2)
Total Scale Score	80.2 (12.2)	75.6 (13.0)

(ID 522) - Table. Mean (SD) scores at PedsQL by risk of DCD

None declared.

ID 530. Changes in perinatal activity in Yorkshire & Humber associated with the SARS-CoV-2 pandemic in 2020 compared to 2015–19

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Background: The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic led to implementation of public health measures worldwide. This may have impacted perinatal activity due to changes in obstetric care delivery or in attendance patterns to hospital. We investigated rates of stillbirth, extreme preterm birth (EPT, <27 weeks' gestational age (GA)), hypoxic ischaemic encephalopathy (HIE), meconium aspiration syndrome (MAS) and perinatal transfer in Yorkshire & Humber during the SARS-CoV-2 pandemic compared to the preceding 5 years.

Methods: Weekly totals (29 December 2014 to 28 December 2020) of: women delivering, births, live births and stillbirths were collected from hospitals in Yorkshire & Humber; antenatal transfers of women with threatened extreme preterm delivery (<27 weeks' GA), and neonatal admissions of infants born EPT or at 36+ weeks' GA with MAS (defined as requirement for nitric oxide within 5 days of birth) or HIE (treatment with active hyperthermia following birth) were collected from the regional transport service and neonatal database. Outcome rates during (a) the first lockdown (20 March to 15 June, 2020), and (b) the entire period following implementation of public health measures (after 20 March 2020), were compared to the historical baseline using interrupted time series analysis, adjusted for population and time trends.

Results: The stillbirth rate dropped from 3.7 per 1000 deliveries before 20th March 2020 to 2.9 afterwards; EPT births decreased from 2.5 to 1.8 per 1000 live births. Following correction for historical trends and seasonal variation, during the first lockdown there were decreased antenatal transfers (relative risk (RR) 0.73, 95% confidence interval (CI) 0.57–0.94) with non-statistically significant increased stillbirth (RR, 95% CI 1.07, 0.77–1.49) and decreased EPT birth (0.88, 95% CI 0.60–1.29). When considering the entire period with public health measures during 2020, both antenatal transfer (RR 0.65, 95% CI 0.55–0.76) and EPT birth (RR 0.73, 95% CI 0.56–0.94) decreased significantly. No statistically significant changes were seen in HIE or MAS using either time period. Full results are in the table. Conclusion: Following implementation of pandemic public health measures, there were fewer antenatal transfers, and fewer EPT births occurred. There was a non-statistically significant increase in stillbirths but no changes in HIE or MAS.

(ID 530) - Perinatal activity indicators 2015–2020: relative risks comparing post-implementation of public health measures for the SARS-CoV-2 pandemic in Yorkshire & Humber to previously, adjusted for historical trend and seasonality.

None declared.

ID 541. Association of antenatal corticosteroids on survival and respiratory outcomes of very premature infants: a population-based cohort study in England and Wales from 2010 to 2017

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Background: Antenatal corticosteroids (ANCs) prevent neonatal mortality and respiratory morbidity. However, much of the evidence was derived from women delivering at 28–34 weeks gestational age (GA). Intensive care is increasingly being considered for babies born from 22–30 weeks GA based on individualised risks that encompass ANCs use. We aimed to explore the impact of a partial and complete ANCs course on outcomes of extremely preterm infants.

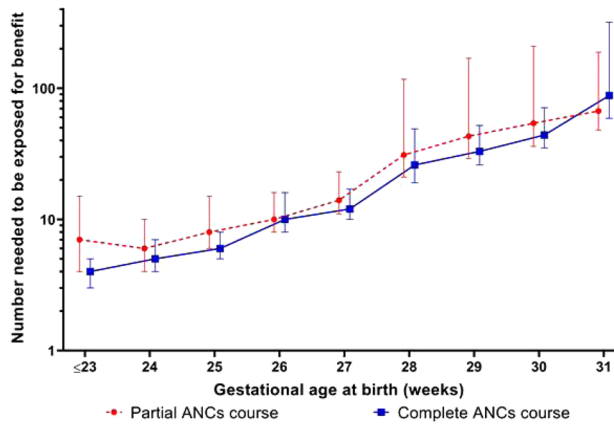
Methods: Routinely collected data from infants <32 weeks GA admitted to 185 neonatal units in England and Wales from 2010 to 2017 were extracted. ANCs were defined as none, partial or complete course. Outcomes were death before discharge, respiratory support requirement at one-week-old, 36 weeks of corrected GA (bronchopulmonary dysplasia (BPD)) and discharge. Logistic regression exploring the effect of ANCs on these outcomes stratified by GA was adjusted for a-priori risk factors (birthweight, gender, multiple pregnancy, prolonged rupture of membranes, chorioamnionitis, congenital anomaly, birth in a tertiary centre and birth year) and clustering within units using robust variance estimator. The number needed to be exposed (NNE) for benefit/harm was derived from adjusted odds ratios and unexposed exposure rates.

Results: 59,296 infants were included with 3568 (5.7%) missing data. Women receiving complete ANCs increased from 62% in 2010 to 70% in 2017, particularly in infants <24 weeks GA where they doubled.

For a complete ANC course, the NNE to prevent one death increases exponentially from 4 (95% CI 3–5) to 88 (95% CI 56–318) in infants ≤23 and 31 weeks GA respectively. Similar findings were found in infants receiving partial ANCs course (Figure). Infants <25 weeks GA who received a complete ANCs course were more likely to receive invasive ventilation in the first week of life and require a longer duration of invasive ventilation (p<0.001). The reverse was seen for GA

>25 weeks. No association was found between a complete ANCs course with BPD and respiratory support at discharge.

Conclusion: ANCs, including a partial course, appear to be more efficacious at reducing neonatal mortality with increasing prematurity. Early, but not late, respiratory morbidity also appears better especially in infants >25 weeks GA.



(ID 541) - Figure. Number needed to be exposed (95% confidence interval) to complete and partial antenatal corticosteroids (ANCs) to prevent one death by gestation. Log scale Y-axis and datapoints interleaved for clarity.

None declared.