Pulmonology

O-110 EFFECT OF PRETERM BIRTH ON ADULTHOOD LUNG FUNCTION: FINNISH BIRTH REGISTRY AND CLINICAL FOLLOW-UP STUDY

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10.1136/archdischild-2014-307384.177

Background Preterm birth and maternal gestational disorders may adversely impact the pulmonary health of offspring.
Aims To examine whether exposure to common conditions during fetal-life (preterm birth, gestational hypertension, gestational diabetes) predicts poorer lung function in young adults.
Methods The ESTER study is a case-control cohort study of individuals born in Northern Finland 1985–89. Study design has two parts: 1) preterm birth included 139 early preterm (<34 weeks) and 239 late preterm (34- <37 weeks) birth subjects; 2) maternal pregnancy disorder included 154 subjects exposed to maternal gestational diabetes (GDM), 136 to pre-eclampsia (PE) and 179 to gestational hypertension (GH). Control group sizes varied. At mean age of 23.5y (±1.7), participants underwent a detailed clinical study including spirometric measurement of FVC, FEV1 and FEV/FVC%, as % from predicted.
Results Participants born preterm had similar FVC but poorer airflow than term-born. This difference was seen among early and late preterm births (Table1), although for the late preterm, significant only in preliminary models.

Lung function in individuals exposed to PE was lower, but this difference disappeared by adjusting for gestational length. Maternal GH or GDM were unrelated to lung function (Table 2).

Abstract O-110 Table 1 Mean difference (% unit, 95% CI) in lung function in young adults born early and late preterm against term against term born controls

Lung function	<34wks	34-37wks
FVC	-7.6 (-13.3 to -2.0)	-2.6 (-5.8 to 0.7)
FEV	-5.5 (-11.4 to 0.4)	-1.7 (-5.1 to 1.8)
FEV/FVC%	1.5 (-2.3 to 5.4)	0.7 (-1.5 to 2.9)

Adjusted for Age, Sex, Height, BMI, parental education (basic, secondary, lower tertiary, upper tertiary, maternal smoking during pregnancy, Self-reported physical activity, smoking, birth z-score, and length of gestation

Conclusion Shorter gestation and fetal-life conditions are likely to have long-lasting impacts on lung function: preterm-born individuals are likely to experience increased airway obstruction.

Abstract O-110 Table 2 Mean difference (% unit, 95% CI) in lung function between young adults exposed to GDM, PE and CH vs. Controls

Variable	GDM (N=469)	PE (N=700)	GH (N=700)
FVC	-1.1 (-3.3 to 1.2)	-0.5 (-2.9 to 1.9)	0.2 (-1.9 to 2.3)
FEV	-1.4 (-3.7 to 0.9)	-0.8 (-3.2 to 1.7)	0.6 (-1.6 to 2.7)
FEV/FVC%	-0.3 (-1.7 to 1.1)	-0.2 (-1.7 to 1.3)	0.3 (-1.0 to 1.7)

Adjusted for Age, Sex, Height, BMI, parental education (basic, secondary, lower tertiary, upper tertiary, maternal smoking during pregnancy, Self-reported physical activity, smoking, birth z-score, and length of gestation.

Even late preterm birth (majority of preterm births), can increase the risk of poor pulmonary outcome. Preeclampsia may have similar effects, adding to the fetal origins of poor pulmonary health. This could be counterbalanced by physical excercise.

O-111 A GENOME-WIDE ASSOCIATION STUDY OF VARIANTS ASSOCIATED WITH GENETIC SUSCEPTIBILITY TO SEVERE BRONCHIOLITIS

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10.1136/archdischild-2014-307384.178

Background and aims Respiratory syncytial virus (RSV) bronchiolitis is the primary cause of hospital admission among children under two years and it is considered to be a risk factor for developing asthma later in life. Although some genetic variants associated with bronchiolitis have been identified by candidate gene studies, the genetic background of the disease is not well understood. Here, we aimed to identify genetic polymorphisms conferring susceptibility to severe bronchiolitis and subsequent asthma.
Methods
Case-control discovery cohorts with 94 cases of severe bronchiolitis and 94 controls collected in Finland and Sweden were genotyped with Illumina HumanOmniExpress BeadChip containing 700.000 SNPs. Replication population of 130 cases and 250 controls collected in Finland is being genotyped with HumanCoreExome BeadChip containing 500.000 SNPs. Respiratory outcomes of all the cohorts have been followed-up to 5–30 years of age. Association signals are further analysed in appropriate functional studies.
Results In the discovery data set, several signals indicating association with bronchiolitis were identified. As an example, SNPs within *ADAR* (adenosine deaminase, RNA-specific) and *KLRK1* (killer cell lectin-like receptor subfamily K, member 1) genes involved e.g. in immune responses showed suggestive associations (p-value $\leq 10^{-4}$). Some of the SNPs previously reported to be associated with bronchiolitis showed weaker signals.
Conclusions We found suggestive association signals for several SNPs. Associations observed both in the discovery population and in the replication cohort are regarded as plausible candidates for further studies. The most promising candidate genes will be analysed in functional studies to verify their potential role in bronchiolitis.

Screening/Pain

O-112 THE INDICATORS IN THE BIOCHEMICAL PHENOTYPE OF 58 INFANTS WITH HEPATORENAL TYROSINEMIA

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10.1136/archdischild-2014-307384.179

Hepatorenal Tyrosinemia (HRT, OMIM 276700) is an autosomal recessive inborn error of metabolism which mainlyaffects

the liver, kidneys and peripheral nerve. The primary defect has been attributed to the last enzyme in the catabolic pathway of tyrosine: fumarylacetoacetate hydrolase (FAH: E. C. 3.7.1.2). Early diagnosis and timely treatment offers an improved prognosis of the tyrosinemic patients. This treatment would require an administration of 2-(2-nitoro-4-trifluoromethylbenzoyl)-1, 3-cyclohexanedione (NTBC, OrfadinÒ), a low phenylalanine and tyrosine diet, and liver transplantation.

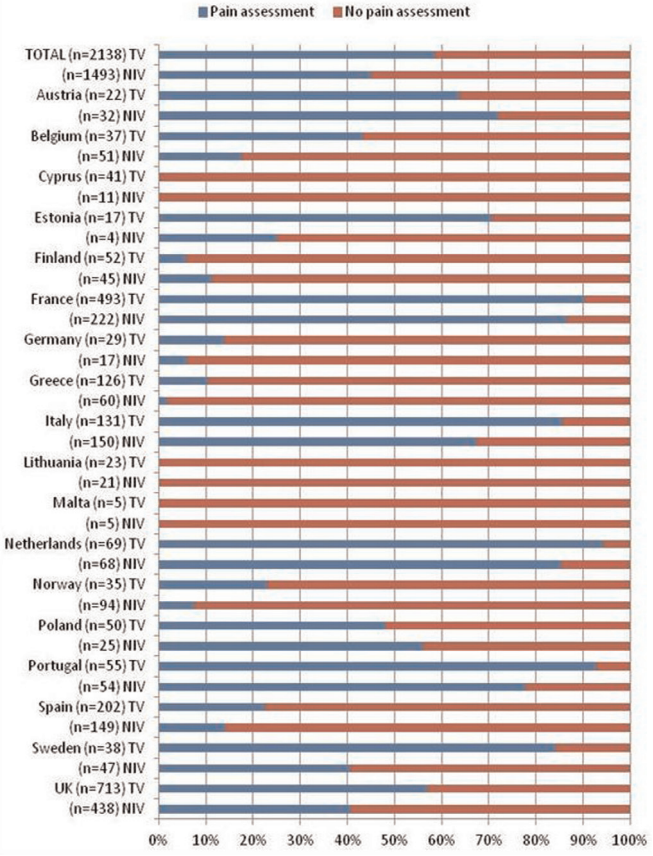
Since several years, our laboratory carry out the diagnosis and the biological follow-up of tyrosinemic of all the own territory. In this report, we summarize the biochemical phenotype of 58 infants with HRT, focusing on the laboratory findings. The 58 infants (30 boys and 28 girls and 16 boys) came from 54 different families. The age at onset of the first symptoms of the disease varied from one week to four months, Thirty three patients died in the same month that the diagnosis was established, and twenty five are actually followed up after NTBC therapy and restriction diet. Elevated concentration of succinyl acetone in the urine, hypertyrosinemia and raised a-fetoprotein level were the most common indicators at the diagnosis. Urinalysis revealed no proteinuria, no cetonuria but sometimes glycosuria. Galactose and ferric chloride tests were negative. Positive reactions with 2, 4-dinitrophenyl hydrazine and cyanide-nitroprusside were observed occasionally. Only five urine specimens presented peculiar odour.

All patients showed hyperbilirubinemia (both direct and indirect bilirubin) and deterioration of liver function (elevated ASAT, ALAT and slightly increazed PAL and GGT).

Increased plasma ferritin and b2-microglobulin levels were seen intwenty four and five infants respectively.

However, fast plasma glucose, total cholesterol, triglycerides, albumin and proteins concentrations were either normal or slightly decreased.

HRT did not affect serum creatinine, urea, calcium, phosphorus and blood ammonia levels.



Abstract O-113 Figure 1 Frequency of pain assessment in tracheal ventilated (TV) neonates and non invasive ventilated (NIV) neonates admitted to NICUs in 18 European countries

O-113 PAIN ASSESSMENT IN VENTILATED AND NON-VENTILATED NEONATES IN NICUS ACROSS EUROPE: EUROPEAN PAIN AUDIT IN NEONATES (EUROPAIN SURVEY)

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10.1136/archdischild-2014-307384.180

Background Neonates undergo many painful procedures during their NICU stay. These may include tracheal intubation/ventilation, skin-breaking procedures, drainage/suctioning of body orifices or cavities. Inherent subjectivity and difficulties of neonatal pain assessment contribute to a wide variety of assessment tools and clinical practices. To date, these practices have been not studied at a large scale.

Objective To determine current clinical practices for neonatal pain assessment in NICUs across Europe.

Methods An epidemiological observational study on bedside pain assessment practices collected data for all neonates in participating NICUs until infants left the unit (discharge, death, transfer to another hospital) or for 28 days. Data collection occurred via an online database for 1 month at each NICU. All neonates up to a gestational age of 44 weeks were included.

Results From October 2012 to June 2013, 243 NICUs from 18 European countries collected pain assessment data in 6680 neonates. Of these, 2142 received tracheal ventilation (TV), 1496 non-invasive ventilation (NIV) and 3042 only spontaneous ventilation (SV). The median (IQR) gestational age of TV, NIV and SV neonates were 32.1 (28.1–37.4), 33.6 (31.0–36.6) and 37.9 (35.0–39.9), respectively ($p < 0.001$). Overall, 58.5% of TV neonates, 45.0% of NIV neonates and 30.4% of SV neonates received bedside pain assessments ($p < 0.001$). Fig. shows pain assessments by country.

Conclusions Over half (58.5%) of TV neonates and less than half (45.0%) of NIV neonates had pain assessments performed in European NICUs. Wide variations in the rates of pain assessment exist among countries and an important improvement seems necessary.