Wednesday 27th April - Morning

Poster Screen 1:

3 mins presentation. Dr Anne Marie Heuchan

56 Risk factors for delayed oral feeding autonomy in left CDH patients

Dr Mélina Bourezma[1], Dr Sébastien Mur[2,5,6], Dr Kevin Le Duc[2,5,6], Dr Estelle Aubry[1,5,6], Dr Emeline Caillau[3], Dr Pascal Vaast[4,6], Pr Laurent Storme[2,5,6], Dr Dyuti SHARMA[1,5,6]

[1]CHU Lille, Department of Pediatric Surgery, Jeanne de Flandre Hospital, F-59000 Lille, France, [2]CHU Lille, Department of Neonatology, Jeanne de Flandre Hospital, F-59000 Lille, France, [3]Univ. Lille, ULR2694 Metrics, Public Health: Epidemiology and Quality of Care, Department of Biostatistics, F-59000 Lille, France, [4]CHU Lille, Department of Obstetrics, Jeanne de Flandre Hospital, F-59000 Lille, France, [5]Univ. Lille, ULR2694 Metrics, Perinatal Environment & Health, F- 59000 Lille, France, [6]Center for Rare Disease Congenital Diaphragmatic Hernia, Jeanne de Flandre Hospital, Centre Hospitalier Universitaire de Lille, 59000 Lille

113 Do we still need the oxygenation index in the NICU? A comparative analysis of different oxygenation indices in congenital diaphragmatic hernia neonates.

Lennart Hale[1], Judith Leyens[1], Lukas Schroeder[1], Bartolomeo Bo[1], Andreas Mueller[1], Mr Lennart Hale, Dr. Florian Kipfmueller[1]

[1]Children's Hospital University of Bonn, Germany

119 Pulmonary hypertension in congenital diaphragmatic hernia: impact on the post-natal outcome and antenatal prediction.

David Basurto[1,2], Francesca Maria RUSSO[1,2], Ioannis PAPASTEFANOU[3], Emma Bredaki[4], Karel ALLEGAERT[1,5], Africa PERTIERRA[6,7], Anne DEBEER[8], Luc DE CATTE[1,2], Liesbeth LEWI[1,2], Roland DEVLIEGER[1,2], Eduard Gratacos[7], Olga GOMEZ[7], Jan DEPREST[1,2,4]

[1]My FetUZ Fetal Research Center, Department of Development and Regeneration, Cluster Woman and Child, Biomedical Sciences, KU Leuven, [2]Clinical Department of Obstetrics and Gynaecology, University Hospitals Leuven, [3]Fetal Medicine Clinic, [4]Institute for Women's Health, University College London, [5]Department of Pharmacy, Erasmus University Medical Center, [6]Clinical Department of Neonatology, Sant Joan de Déu University Hospital, [7]BCNatal, Barcelona Center for Maternal-Fetal and Neonatal Medicine (Hospital Clínic and Hospital Sant Joan de Déu), Fetal i+D Fetal Medicine Research Center, Institut Clinic de Ginecologia, Obstetricia i Neonatologia, IDIBAPS, CIBER-ER, University of Barcelona, [8]Clinical Department of Neonatology, University Hospitals Leuven

130 Bronchoenteric fistula in a patient with chronic recurrent congenital diaphragmatic hernia

Dr. Alicia Eubanks[1], Dr. Cara Berkowitz[1], Dr. Valerie Luks[1], Dr. Gary Nace[1], Dr. Natalie Rintoul[1], Dr. Alan Flake[1]

[1]Children's Hospital Of Philadelphia

56

Risk factors for delayed oral feeding autonomy in left CDH patients

Dr Mélina Bourezma[1], Dr Sébastien Mur[2,5,6], Dr Kevin Le Duc[2,5,6], Dr Estelle Aubry[1,5,6], Dr Emeline Caillau[3], Dr Pascal Vaast[4,6], Pr Laurent Storme[2,5,6], Dr Dyuti SHARMA[1,5,6]

[1]CHU Lille, Department of Pediatric Surgery, Jeanne de Flandre Hospital, F-59000 Lille, France, [2]CHU Lille, Department of Neonatology, Jeanne de Flandre Hospital, F-59000 Lille, France, [3]Univ. Lille, ULR2694 Metrics, Public Health: Epidemiology and Quality of Care, Department of Biostatistics, F-59000 Lille, France, [4]CHU Lille, Department of Obstetrics, Jeanne de Flandre Hospital, F-59000 Lille, France, [5]Univ. Lille, ULR2694 Metrics, Perinatal Environment & Health, F- 59000 Lille, France, [6]Center for Rare Disease Congenital Diaphragmatic Hernia, Jeanne de Flandre Hospital, Centre Hospitalier Universitaire de Lille, 59000 Lille

Background: Congenital diaphragmatic hernia (CDH) is rare disease associated to major nutritional and digestive morbidities. Oral feeding autonomy remains a major issue of the care management of these patients. The aim of this study was to specify the perinatal risk factors of a delay oral feeding autonomy in patients operated for CDH.

Methods: This monocentric cohort study included 138 CDH patients who were divided into 2 groups: “on time” oral feeding autonomy (group 1: ≤75e percentile of age at oral feeding autonomy in the study population, n=63) and “delayed” oral feeding autonomy (group 2: > 75e percentile of age at oral feeding autonomy in the study population, n=21). Antenatal, postnatal and per surgical data were recorded and analyzed from birth until first hospital discharge. To get rid of biased or redundant factors related to the CDH severity, statistical analysis was adjusted according to the need of a patch repair.

Results: Demographic data were comparable in both groups. After analysis and adjustment, oral delay feeding autonomy was not related to LHR o/e, to intrathoracic liver and/or stomach position, nor to operative duration. After adjustment (patch repair), the prophylactic gastrostomy (OR adjusted: 20.3, IC 95%: 4.5 – 91.5), the postoperative bowel obstruction (OR adjusted: 9.0, IC 95%: 1.6 – 51.6) or the reoperation (OR adjusted: 11.7, IC 95%: 2.0 – 68.7) remained significantly associated to delayed oral feeding autonomy.

Conclusion: This study revealed that prophylactic gastrostomy, postoperative bowel obstruction and reoperation were significantly associated to delayed oral feeding autonomy. Some of these factors are available for care adaptations to promote the acquisition of oral feeding autonomy in CDH patients.

113

Do we still need the oxygenation index in the NICU? A comparative analysis of different oxygenation indices in congenital diaphragmatic hernia neonates.

Lennart Hale[1], Judith Leyens[1], Lukas Schroeder[1], Bartolomeo Bo[1], Andreas Mueller[1], Mr Lennart Hale, Dr. Florian Kipfmueller[1]
[1]*Children's Hospital University of Bonn, Germany*

Background
The oxygenation index (OI) (OI=MAP x FiO2 x 100/PaO2) is widely used for risk assessment in CDH neonates. The mean airway pressure plays a central role but in times of more lung protective ventilation the Horowitz Index (HI) (HI=PaO2/FiO2) might be a valuable alternative. Primary aim of this study was to compare the predictive value and the correlation of OI and HI.

Methods
Retrospective study. OI and HI were calculated every hour within the first 24 hours of life (only pre-ECMO) of CDH newborns admitted to Children´s Hospital Bonn (2013-2020). Correlation of OI and HI using Spearman rank coefficient. AUC, sensitivity, specificity to predict need for ECMO and mortality for cut-offs of OI≥40 and HI<35 was calculated.

Results
138 CDH newborns were included. Baseline characteristics are presented in table 1. Correlation coefficient for matched-pair OI/HI within the first 6 hours of life was r=-0.980, p<0.001 (n=510), and r=-0.950, p<0.001 for lowest HI and highest OI (first 24 hours). Highest OI and lowest HI performed similar in predicting need for ECMO (OI: AUC 0.878 (95%CI: 0.806-0.950) p<0.001; HI: 0.867 (95%CI: 0.801-0.932) p<0.001) and mortality (OI: AUC 0.824 (95%CI: 0.745-0.903) p<0.001; HI: AUC 0.814 (95%CI: 0.732-0.895) p<0.001)). Overall, 45 patients had an OI≥40 and 52 a HI<35. Sensitivity and specificity for need for ECMO were 62.3% and 90.9% for OI≥40, and 65.6% and 84.4% for HI<35. Sensitivity and specificity for mortality were 68.8% and 78.3% (OI), and 71.9% and 72.6% (HI) for need for ECMO.

Conclusion
Although there is no linear correlation between the OI and the HI, both values correlate very well. They have a similar predictive capacity for both their best and their worst value within the first 24 hours. A HI≤25 is associated with a mortality of 65% while a HI≥45 is associated with favorable outcome.

Images

Variable	n=138
Male, n	86 (62.3%
Gestational age, weeks	37.9 [35.6-38.6]
Birth weight, kg	2.8 [2.4-3.3]
Left-Sided CDH, n	120 (87.0%)
o/e LHR, percent	38 [30-47]
Liver-up CDH, n	75 (54.4%)
FETO, n	29 {21.0%)
Day of repair	6 [4-8]
Patch-repair	81 (63.3%)
Highest Mean Airway Pressure, cm H2O	14 [12-16]
ECMO, n	56 (40.6%)
Early death, n	4 (2.9%)
Death, n	32 (23.2%)
Age at ECMO start, hours	9.8 [6.4-20.4]
Duration ECMO, days	8.6 [5.2-18.7]
Patch-repair, n	81 (63.3%)
Day of repair, Day of life	6 [4-8]

119

Pulmonary hypertension in congenital diaphragmatic hernia: impact on the post-natal outcome and antenatal prediction.

David Basurto[1,2], Francesca Maria RUSSO[1,2], Ioannis PAPASTEFANOU[3], Emma Bredaki[4], Karel ALLEGAERT[1,5], Africa PERTIERRA[6,7], Anne DEBEER[8], Luc DE CATTE[1,2], Liesbeth LEWI[1,2], Roland DEVLIEGER[1,2], Eduard Gratacos[7], Olga GOMEZ[7], Jan DEPREST[1,2,4]

[1]My FetUZ Fetal Research Center, Department of Development and Regeneration, Cluster Woman and Child, Biomedical Sciences, KU Leuven, [2]Clinical Department of Obstetrics and Gynaecology, University Hospitals Leuven, [3]Fetal Medicine Clinic, [4]Institute for Women's Health, University College London, [5]Department of Pharmacy, Erasmus University Medical Center, [6]Clinical Department of Neonatology, Sant Joan de Déu University Hospital, [7]BCNatal, Barcelona Center for Maternal-Fetal and Neonatal Medicine (Hospital Clínic and Hospital Sant Joan de Déu), Fetal i+D Fetal Medicine Research Center, Institut Clinic de Ginecologia, Obstetricia i Neonatologia, IDIBAPS, CIBER-ER, University of Barcelona, [8]Clinical Department of Neonatology, University Hospitals Leuven

Background:
Congenital diaphragmatic hernia (CDH) related pulmonary hypertension (PH) is a key determinant of mortality, therefore it is important to understand its impact in the fetal therapy era.
Objective:
We aim to: (1)determine the prevalence of CDH-PH; (2)determine the impact of CDH-PH on postnatal outcome; (3)identify predictors for CDH-PH.
Study Design:
Retrospective analysis on prenatally diagnosed isolated, left-sided CDH managed at three FETO centers (UZLeuven, BCNatal, and GOSH) between 2008 and 2020. The primary outcome was the presence of CDH-PH during hospitalization and at discharge. To assess mortality correlations we constructed Cox survival regression models using pre-and postnatal data. To assess dynamic discrimination ability for the prognostic models we used Time-dependent AUC. Finally, to identify predictors for CDH-PH we fitted a logistic regression model with receiver operative curve (ROC) analysis.
Results:
Of the 197neonates, 56 (28.4%) died before discharge. CDH-PH was present in 73% during hospitalization and 6% at discharge. CDH-PH: (Hazard Ratio (HR) 21.559 (6.697-69.400), o/eLHR: HR 0.934 (0.908-0.961), and FETO: HR 0.599 (0.377 - 0.952) have an impact in mortality as shown in the Cox survival model using CDH-PH as a time-varying covariate.
The FPR for 90% sensitivity was progressively decreased for increasing time after delivery, therefore the discrimination becomes better (Postnatal day, AUC, 90% FPR): D1, 0.79, 44.2; D7, 0.82, 41.2; D14, 0.83, 39.9; D21, 0.84, 38.4; D28, 0.85, 37.5.
Finally, a lower o/eLHR, lower GA at o/eLHR measurement, higher birth weight, and FETO increased the risk for the development of CDH-PH (Table).
Conclusions:
The presence of CDH-PH is very common early in life. The presented models give us the capability of constructing individualised dynamic survival curves using pre-and postnatal data. There is a correlation between common markers and CDH-PH occurrence, although with scarce value.

Images

Table. Logistic regression model for the prediction of congenital diaphragmatic hernia-related pulmonary hypertension (CDH-PH).

Outcome: CDH-PH		
Variable	**OR (95%CI)**	**p value**
o/eLHR	0.95 (0.92 - 0.98)	0.0009
GA LHR measurement	0.88 (0.81 - 0.96)	0.0049
Z- Birth weight	1.38 (1.02 - 1.88)	0.0385
Liver herniation	NA	
GA at delivery	NA	
FETO	2.44 (1.05 - 5.86)	0.0398
Best risk cut off	65.8 %	
Sensitivity for the best risk cut off	83.33 %	
FPR for the best risk cut off	36.21 %	

130

Bronchoenteric fistula in a patient with chronic recurrent congenital diaphragmatic hernia

Dr. Alicia Eubanks[1], Dr. Cara Berkowitz[1], Dr. Valerie Luks[1], Dr. Gary Nace[1], Dr. Natalie Rintoul[1], Dr. Alan Flake[1]
[1]*Children's Hospital Of Philadelphia*

Background: Bronchoenteric fistulas are very rare, most frequently seen as a complication of surgery for traumatic diaphragm rupture or oncologic resection. We present the first known case of bronchoenteric fistula in a patient with recurrent congenital diaphragmatic hernia (CDH).

Methods: The patient's medical records were retrospectively reviewed.

Results: The patient was a 24 year old male with history of prenatally diagnosed right CDH status post fetal tracheal occlusion, postnatal Gore-Tex patch repair at 10 days of age, and partial patch removal with muscle flap repair for recurrent diaphragmatic hernia at age four. His hernia subsequently recurred a second time and was observed for years as a stable small posterior recurrence containing bowel. He presented at age 24 with necrotizing right lower lobe pneumonia and associated abscess. Abscess fluid grew enteric bacteria but no communication with intestine could be demonstrated despite extensive imaging. He improved on antibiotic therapy and was discharged but was readmitted a week later with respiratory failure and severe necrotizing pneumonia involving all lobes of the right lung. Although the herniated intestine had previously appeared benign, during the second admission he developed abdominal distention concerning for small bowel obstruction. On surgical exploration he was found to have a bronchoenteric fistula from herniated bowel to the right lower lobe bronchus, encased in dense scar tissue. This was managed with resection of the fistulized small bowel, diaphragm repair, and placement of a one-way endobronchial valve in the affected bronchus with temporary single lung ventilation. Two lung ventilation could not be re-established due to failure of the endobronchial valve and the patient ultimately succumbed to respiratory failure and complications of septic shock.

Conclusion: We report a rare complication of CDH in a patient with residual patch material and a small, stable recurrence which was followed for years and appeared clinically benign.