

RELEASE OF CATECHOLAMINES DURING THE DIFFERENT PHASES OF BIRTH SIMULATION IN THE FETAL LAMB  
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The precise mechanisms for catecholamine release at birth are not well established. Labor and delivery, cold, cord clamping, hypoxia and acidosis are stimuli of catecholamine release. Lung liquid resorption is in relationship with catecholamine release. To study the effect of the different stress applied on lung tissue, we investigated the different phases of birth simulation in utero focused only on lung distension, ventilation with Nitrogen(N<sub>2</sub>) without modifications of fetal blood gases, then with air and oxygen. We studied 16 ewes at 134,75±4 days of gestational age. Mean fetal weight was 3,63±0,63 kg. Pressure of distension was 25±10 cm of water. For rhythmic ventilation with N<sub>2</sub>, pressure of inflation was 27±6 mm Hg, PEEP 4±5 and I/E 36±13%. Catecholamine samples were withdrawn after 15 min following modifications. Catecholamine concentrations were measured by high-performance liquid chromatography with electrochemical detection. Statistical analysis compared the consecutive steps analyzed by the non-parametric Wilcoxon test and considered significant for a p<0,01

RESULTS	control	distension	N <sub>2</sub> Ventil	Air Ventil	Oxygen
Norepi	1025±1018	1113±1045	1905±2338	1012±972	732±474
Epi	135±101	141±116	588±495	561±437	336±265
Dopamine	90±51	72±30	177±304	68±28	64±24
PH	7,37±0,04	7,35±0,04	7,35±0,05	7,33±0,07	7,36±0,07
PaO <sub>2</sub> torr	19±	20±5	22±4	38±11	11±105

Ventilation increased 4,6 fold epinephrine concentrations. However distension did not increase catecholamine release. Ventilation with air and O<sub>2</sub> decreased concentrations and placental blood flow was abolished. The precise mechanism which induces catecholamine release during rhythmic ventilation with N<sub>2</sub> is not elucidated.

THE CONSEQUENCES OF BIRTH SIMULATION ON PULMONARY BLOOD FLOW IN THE FETAL LAMB  
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At birth pulmonary blood flow (PBF) increases ten fold allowing newborn oxygenation replacing feto-placental exchanges. Mechanical and chemical stimuli have been previously investigated in experiment including stress of labor, cold and cord clamping. The aim of our study was to consider sequentially only mechanical and gaseous stimuli applied to the lungs of the fetal lamb and their consequences on PBF. Therefore we studied five steps: control, distension with nitrogen(N<sub>2</sub>), rhythmic ventilation with N<sub>2</sub>, with air then with O<sub>2</sub>. We studied 16 fetal lambs three days after fetal surgery at 134,75±4 days of gestational age, weight: 3,63±0,63 kg. PBF was continually measured by a flowmeter fixed on the left pulmonary artery and validated by microspheres method after flow steady state. Continuous distension pressure was 25±10 cm of water. Characteristics of rhythmic ventilation was a frequency of 50±6, I/E:36±13, IP:27±6 mm Hg and a PEEP of 4±5 under N<sub>2</sub>, followed by air then by O<sub>2</sub>. For statistical analysis each step was compared to the previous one using the non parametric Wilcoxon test and considered significant for a p<0,01\*.

Results	control	distension	N <sub>2</sub> ventil	air	oxygen
PBF ml.min <sup>-1</sup> .kg <sup>-1</sup>	32±20	71±48*	220±71*	258±8	279±116
Variation		220%	690%	806%	871%

We conclude that distension such as rhythmic ventilation is a preponderant factor to increase PBF more than oxygenation. This is in relationship with lung liquid resorption, increased recruited capillaries, modified alveolocapillary interface and release of hormones such as prostacyclin, bradykinin and EDRF.

VALIDATION OF A HOT WIRE ANENOMETER IN OBTAINING RESPIRATORY SYSTEM COMPLIANCE IN INTUBATED INFANTS.  
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We validated the use of hot wire anemometry (NVM Bear Corp) to derive respiratory compliance in intubated infants, against the gold standard (GS) of single breath occlusion values in the same infants. Tidal flow was measured by hot wire anemometry; enabling an integral volume to be obtained. The quotient of volume and the inflation pressure amplitude of the ventilator provided respiratory system compliance. To ensure fully passive expiration, only paralysed or sedated patients were studied. Analyses were blinded to results of the alternate method. 15 RDS infants were recruited (BW 4.4±0.9 kg). Of these 12 infants were amenable to analysis. Three were excluded as the single breath analysis to proved technically impossible. By anemometer compliance range was: 0.21-1.78 ml/cm H<sub>2</sub>O; by the GS: 0.24-1.88 ml/cm H<sub>2</sub>O). Agreement between the two methods was excellent. Inspired volume: correlation coefficient: 0.989. Expired volume: correlation coefficient 0.991. We conclude that the Neonatal Volume Monitor can be used to obtain valid estimates of respiratory compliance on-line in intubated infants. Further, in those infants where single breath values cannot be obtained, the NVM provides an estimate of compliance.

NEW STANDARDS FOR BODY HEIGHT, WEIGHT, AND SKINFOLD THICKNESS IN GERMAN SCHOOLCHILDREN  
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No systematic investigations on the distribution of anthropometric parameters of children have been performed within the last decade in Middle Europe. We therefore evaluated height, weight, arm circumference and skinfold thicknesses at four different body sites in 2600 schoolchildren and adolescents aged 6 to 19 years living in the Rhine-Neckar region. Normal centile tables were set up for all parameters studied, including height-related weight and fat-free mass. In addition, pubertal status was assessed in almost all subjects. Data was compared to the earlier West-German, Swiss, Dutch, English and Turkish standards. Average height was significantly increased compared to most comparable previous studies; a mean deviation of +0.4 SD compared with the Swiss and even of +0.9 SD compared with the widely used British standards (Tanner) was found. In comparison to the earlier West-German standards, the most striking difference was a higher average weight in the children under study which was especially pronounced in the pubertal age. In addition, a group of 100 children from Turkish families living in Germany were studied. These children were 0.65 SD smaller than German children, but exceeded the Turkish normal centiles. In summary, we found a continuing increase of average body height compared to the Mideuropean studies performed in the 1960s and 70s, indicating an ongoing secular trend. The shift of the weight/height relation is compatible with a further improved general state of nutrition. The commonly used local standards underestimate normal height and weight and should be replaced by more up-to-date standards.

BIOELECTRICAL IMPEDANCE ANALYSIS (BIA) IN THE ASSESSMENT OF BODY COMPOSITION: STANDARDISATION, VALIDISATION AND NORMAL CENTILES FOR BIA-DERIVED LEAN BODY MASS (LBM)  
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BIA is a new method for the assessment of body composition. Until now, it has rarely been validated in children. Reliability studies demonstrated a very low intra- and inter-observer variation. In order to investigate the validity of BIA in predicting LBM in comparison to conventional anthropometry, we measured beside whole-body impedance, total body potassium (TBK) by <sup>40</sup>K whole-body plethysmography, skinfold thickness and arm circumference in 111 normal children aged 4 to 18 years. The resistance index (height<sup>2</sup>/impedance) proved to be the best single predictor of TBK-derived LBM (R<sup>2</sup>=0.94). Inclusion of age, height (in boys) and weight (in girls) into linear prediction equations further improved the prediction of LBM (R<sup>2</sup>=0.97), reducing the mean prediction error to 2.2 kg. Application of BIA in 2800 normal subjects aged 5 to 20 years allowed to construct normal centile curves for BIA-derived LBM in both sexes. LBM was normally distributed, indicating that the well-known skewness of the weight distribution in normal children is due to an uneven distribution of the fat mass. We conclude that BIA is a fast, non-invasive, accurate and reliable technique to estimate body composition in children.

PRETERM BIRTHS IN GREECE. A POPULATION BASED STUDY.  
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Data on 10654 births (3368 to primigravidae and 7286 to multigravidae mothers) which occurred in Greece during April 1983, were used to define the factors associated with preterm delivery. The preterm delivery rates were 5.9% and 8.4% for primi and multigravidae respectively. Analysis was carried out for these two groups separately. For primigravidae, independent statistical associations with and a protective effect for drugs such as iron and vitamins taken during pregnancy. For multigravidae, the statistically important independent factors were mother's age, marital status, smoking in pregnancy, past history of fetal losses (miscarriages and/or induced abortions and/or stillbirths), and hospitalisation during pregnancy. These mothers showed a different pattern of antenatal visits during the first and second trimesters and a protective effect for drugs such as iron and vitamins taken during pregnancy.