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IUGR: DEFINITION: LUBCHENCO OR WHAT ?

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The fetal weight below the 10th percentile for gestational age is been accepted as IUGR generally. But there is no international consensus about the definition . Lubchenco and co-workers had been definated the IUGR status in 1963 and published the details from Denver. Lubchenco and other authors have developed or changed the definition by their own examinations in consecutive years. The statements of; Fetal weight below the 3th percentile, below 5th or below 15th percentile, fetal weight below two standart deviations for normal gestational age, head circumference / abdominal circumference ≥ 2 standart deviations, ponderal index (birth weight – gr / heigt – cm^3) below 10th percentile for gestational age , fetal abdominal circumference & two standart deviations for gestational age, are the different definitions of IUGR. Small for gestational age (SGA) is a different terminology for that situation which has been used by Lubchenco and Battaglia in 1967 for the first time.
Lubchenco's results from examination on white infants in 1963 has been used for over 30 years as standart datas in USA. Brenner and colleagues used white and black infants delivered in Cleveland and North Carolina in 1976 and Williams used live births in four ethnic groups in California to examine fetal growth curves and found that fetal growth may vary in different ethnic and religious groups from each other . Ott used postnatal assesment of infants born in St Louis in different national groups and found that each of these growth curves were different from each other in different populations. For that reason they were not considered a certain growth curve necessarily representative of the entire population. In USA the fetal growth datas derived from Alexander ' s nationwide basis examination in 1996 and in Canada Arbuckle ' s nationwide basis examination in 1993 are being used in these countries.

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IUGR- DETECTION AND MANAGEMENT

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Intrauterine growth restriction refers to condition in which a fetus is unable to grow to its genetically determined potential size to a degree that may effect the health of the fetus. It is considered that fetus is growth restricted if presents weight below two standard deviations of the expected weight for its gestational age or below the tenth percentile of the weight curve. It is a syndrome that corresponds to different, but interrelated causes. IUGR may be considered as the consequence of a disease process within three elements that sustain and regulate fetal growth - the maternal component, the placenta, or the fetus.
IUGR remains a challenging problem for obstetricians. Identifying this group of fetuses is important in order to have the opportunity to intervene. No single measurement or assessment helps to diagnose or exclude possible IUGR. Therefore, systematic approach, complex strategy and assessment are necessary. To reduce perinatal morbidity and mortality it is necessary to do serial ultrasound scans and investigate fetal well-being. If fetal hypoxia occurs, it should be detected as early as possible. This can be done by Doppler measurements of fetal and uteroplacental blood flow.
Estimation of overall fetal growth, individual body parameters, amniotic fluid volume, and Doppler studies are useful in order to reduce perinatal and maternal morbidity and mortality.

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MONITORING THE IUGR FETUS

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Intrauterine growth restriction(IUGR) according to the present definition is encountered in abou 15 % of the pregnancies.It can be associated to many fetal or adnexal abnormal conditions but the most frequent and dangerous complication is represented by foetal hypoxaemia observable in 30-35 % of the cases. This is the principal cause of fetal demise and /or neonatal morbidity and mortality. As a consequence in order to improve the clinical outcome an objective monitoring of the fetal oxygenation is crucial particularly for assessing the timing of the delivery. In case of hypoxaemia the fetus adapts to this condition by altering the vital functions. Blood flow redistribution first occurs and the cardiac functions are also altered. Doppler technology allows to observe haemodynamic changes and cardiotochography (CTG) depicts, if assisted by computer evaluation,even subtle changes in heart activity particularly the variability of the heart rate.

By investigating with Doppler umbilical arteries and fetal aorta and studying the fetal heart rate variability it is possible to assess with good accuracy the presence or absence of hypoxaemia and the risk to develop acidemia therefore modulating the characteristics of the control and of the management improving the perinatal outcome.

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MANAGEMENT OF IUGR FETUSES

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Background: When decisions about the optimal timing of delivery have to be made in pregnancies complicated by intrauterine growth retardation, the risks of prematurity must be balanced against the risks of prolonged fetal exposure to a hostile intra-uterine environment. Investigation of the time sequence in which alterations of fetal monitoring parameters occur, may assist in the management of these pregnancies.

Methods: 110 singleton fetuses with intrauterine growth retardation were studied longitudinally from 24 weeks of gestation onwards. Short-term variation (STV) of fetal heart rate, pulsatility indices (PI) of arterial and venous Doppler waveforms and amniotic fluid index were assessed at each monitoring session. The study population was divided into two groups: group 1 comprised pregnancies with severely premature fetuses, which were delivered < 32 weeks and group 2 included pregnancies delivered after 32 completed weeks. Logistic regression was used for modeling the probability for abnormality of a variable in correlation to the time interval before delivery. Trends over time were analyzed for all variables by multilevel analysis.

Results: 93 (60 in group 1 and 33 in group 2) fetuses had at least three data sets (median: 4; range: 3-27) and last measurements were taken within 24 hours of delivery or intrauterine death. The percentage and degree of abnormal findings were much higher in group 1 as compared to group 2. Amniotic fluid index and umbilical artery PI were the first parameters to become abnormal and they were followed by the middle cerebral artery, aorta, STV, ductus venosus and inferior vena cava. In group 1, STV and ductus venosus PI showed mirror images of each other in their trend over time. Perinatal mortality was significantly higher if both parameters were abnormal as compared to only one or neither of them being abnormal [13/33 (39%) vs 4/60 (7%); P = 0.0002].

Conclusions: Ductus venosus PI and STV of fetal heart rate are important indicators for the optimal timing of delivery before 32 weeks of gestation. Delivery should be considered if one of these parameters becomes persistently abnormal.

Key Words: Intrauterine growth retardation, Fetal monitoring, Fetal heart rate, Fetal Doppler, Amniotic fluid index, Short-term variation, Ductus venosus.