Perinatal Hypoxia and The Perinatologists

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Indian Society of Perinatology and Reproductive Biology (ISOPARB) is a unique organization dedicated to the care of a pregnant woman, her fetus and the new born up to 7 days of birth. The area of care with "Reproductive Biology", covers the rest of her health since childhood. The perinatal care, covers the maternal and fetal health over the ante partum, intra partum, post partum period and also the new born care for this first 7 days of birth. The word "***Obstetrics***" is the branch of medicine and surgery that deals with child birth. ***Perinatal care*** provides a wide area of care with responsibility for the woman, the fetus and the new born by the perinatologists.

Perinatal mortality has been defined as the death of a fetus weighing 500 gm of more at birth (or 22 completed weeks of gestation where birth weight is not available or crown heel measurement ≥25 cm), plus the death of an infant within the first 7 days of birth. It is expressed in terms of per 1000 total births. It appears that the use of the word "perinatology" is more concise and focused. The founder members of this organization "ISOPARB" thoughtfully selected the words keeping in mind the importance of combined care for the mother, fetus and the newborn. On sum, the perinatologist and the reproductive biologists are the Obstetricians and the Gynecologist. As Obstetrician, we maintain maternal health care upto 6 weeks postpartum. As perinatologists, we additionally maintain the healthcare of the new born.

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As an **Obstetrician or a Perinatologist**, we need to keep in mind that our performance outcome is being assessed following evaluation of maternal as well as perinatal health parameters. It is true, we involve the neonatologist colleagues additionally for the care of the newborn. By the definition of ***perinatal mortality*** as discussed above, we the Perinatalogists / Obstetricians are accountable for the care to the mother, fetus and the new born (within 7 days of birth). Otherwise improvement of perinatal mortality as well as maternal mortality is our commitment while working as a Perinatalogist / Obstetrician.

I am sure, the discussion as made above, may incite arguments and counter arguments to make the issue clear.

Perinatal outcome may be affected adversely even in a normal pregnancy due to emergence of an obstetric problem (placental abruption). On the other hand an antepartun problem may be continued to the intrapartum period (placental in insufficiency) and also to the neonate and affect the neonatal outcome too.

Obstetric complications may affect both the fetal and maternal outcome adversely.

Intervillous thrombus formation, And massive perivillous fibrin deposition (APL Syndrome, Lupus anticoagulant, Autoimmunity), are the cause for fetal hypoxia, fetal growth restriction and pregnancy loss.

Multifetal pregnancy is an independent risk factor for Cerebral Palsy (CP) and Hypoxic Ischaemic Encephalopathy (HIE). The important variable factors are: Gestational age, Zygocity, Chorionicity

and weight discordance. Monochorionicity has significantly higher risks. So also IUD of one twin. This increases the risks based on the gestational age. Twin to twin transfusion syndrome (TTTS) increases the risks depending upon Quintero staging. We may loose both the fetuses in such a situation. So also with twin reverse arterial perfusion (TRAP) or the acardiac twins. Conjoint twins are rare. In multifetal pregnancy, pre term birth (50%) is a significant risk factor for perinatal loss.

Sudden maternal collapse in the peripartum period, is not uncommon. Following sudden maternal cardiopulmonary arrest, if there is no effects on CPR for 4 minutes and pregnancy is more than 20 weeks, perimortem Cesarean Delivery (CD) is done. There is no need of anesthesia and perimortem CD is done in the resuscitation place. It is done for the best interest of the mother. Delivery within 5 minutes improves neonatal survival. Delivery beyond 10 minutes increases the risks of neonatal neurological sequelae significantly and also the mortality.

Perinatal complications may be acute, (placental abruption) or chronic (IUGR). Depending upon the severity and duration of complications, perinatal hypoxia and the neonatal outcome varies.[1] Hypoxemia-ischemia is associated with metabolic acidosis (raised blood lactate) and low blood pH. When the asphyxia is prolonged, it causes neurologic illness in the neonate. Pathophysiologic changes related to hypoxic-ischemic encephalopathy are poorly understood. Neurological disorders including cerebral palsy are multifactorials. Involvements of general, physiological, environmental and obstetric factors have been mentioned. Over all incidence of encephalopathy has been observed to be 1-2 cases per 1000 term live born neonates. Occurrence is much more in preterm neonates.[2]

Animal data correlates well for fetal hypoxia (with duration and severity), to that of the severity of brain damage. In humans, the response it is not the same. Importantly in humans, experimental manipulation is not possible. The information is extrapolated from actual cases of umbilical cord prolapse, abruptio-placenta, shoulder dystocia, sudden maternal collapse or rupture of the uterus.

Cardiotocography is good to detect the fetal wellness rather than the illness. Benefits of CTG monitoring in labor was reduction in neonatal seizures (50%). Suspicious and pathological tracings have a limited capacity to predict metabolic acidosis and hypoxic neurological injury. Continuous CTG monitoring was associated with 63% increase in cesarean delivery. **Low Apgar Scores** at 5 and 10 minutes, are associated with higher risks neurological impairment. Neuro-imaging with Magnetic Resonance Imaging (MRI) or MR Spectroscopy (MRS), is superior to visualize the neurological (brain) findings. Hypoxic Ischemic Encephalopathy (HIE) may be associated with multisystem (renal, GI, hepatic, or cardiac) injury. Presence of umbilical artery reduced blood PH (<7.0) and higher base deficit (>16m mEq/L), indicate significant acidosis.[3] With this, the risk of severe neurological morbidity is high (37%).

India has made a significant improvement in both the areas of Maternal Mortality and Perinatal Mortality. Works need to be continued to maintain the progress rate to achieve the target of Sustainable Development Goals (SDG) to the level of MMR <70/100,000 LB and NMR <12/1000 LB by 2030.

REFERENCE

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