

RESPIRATORY DISTRESS SYNDROME IN INFANTS (A REVIEW)

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Abstract: - Preterm labor is the main cause of infant mortality in advanced countries; babies born preterm are at higher risk for short-term and long-term complications, including physical disability and mental development. Due to severe neonatal complications often followed, preterm labor is a very serious problem. Some of these complications include respiratory distress syndrome, intracranial hemorrhage, sepsis, and necrotizing colitis, many of which might lead to the death of the infant. One of the major problems of preterm infants is the lack of adequate lung function and, consequently, respiratory distress, known as "Neonatal Respiratory Distress Syndrome". The most common reason for admission of preterm and term infants in hospitals is respiratory disease for special care. Respiratory distress syndrome is more prevalent in preterm infants, and its incidence is related to birth weight and intrauterine age. To paint a general picture, it is prevalent in infants of diabetic mothers, gestational age under 37 weeks, multiple pregnancy, the implementation of caesarean section, accelerated delivery and cold stress. It is most common in newborns. The main cause of respiratory distress syndrome in newborns is the lack of surfactant in the baby's lung. The main components of surfactant are lecithin (disalmytolyl phosphatidyl choline), phosphatidyl glycerol, apoproteins (SP-A, B, C, D) and glycerol. With increased uterine age, more phospholipid is produced and stored in type 2 alveolar cells. These agents are released into the alveoli and reduce the surface tension and help prevent collapse of the small airway at the tail end and help rehabilitate the lung after exhalation; however, the amount that is produced and secreted may not be adequate to meet the premature baby's demand. At 20 weeks of pregnancy, surfactant is present with high concentrations in the lung tissue of the fetus, but it doesn't reach the level of the lung alveoli; it appears in amniotic fluid between 28 and 32 weeks.

Key words: - Respiratory distress, infants, Review

Introduction:

Preterm labor is the main cause of infant mortality in advanced countries; babies born preterm are at higher risk for short-term and long-term complications, including physical disability and mental development. Due to severe neonatal complications often followed, preterm labor is a very serious problem. Some of these complications include respiratory distress syndrome, intracranial hemorrhage, sepsis, and necrotizing colitis (1), many of which might lead to the death of the infant. One of the major problems of preterm infants is the lack of adequate lung function and, consequently, respiratory distress, known as "Neonatal

Respiratory Distress Syndrome" (2). The most common reason for admission of preterm and term infants in hospitals is respiratory disease for special care. Respiratory distress syndrome is more prevalent in preterm infants, and its incidence is related to birth weight and intrauterine age. To paint a general picture, it is prevalent in infants of diabetic mothers, gestational age under 37 weeks, multiple pregnancy, the implementation of caesarean section, accelerated delivery and cold stress. It is most common in newborns (1). On the other hand, the occurrence of respiratory distress syndrome is decreased in case of high chronic hypertension and high blood pressure during

pregnancy, maternal drug addiction, prolonged amniotic membrane rupture and consumption of corticosteroids before childbirth (3). Over the past 20 to 30 years, many improvements have been made in the birth rate of infants. Scientists have concluded that resuscitation and special care should be "definitively determined" in 26-week-old infants with infants with a gestational age of 25 weeks, and in infants with a fetal age of 24 weeks "if possible"; however, in the domain of delivery, no action should be taken in 23 weeks or less of pregnancy. In fact, the timing of preterm labor is from 24 to 34 weeks of gestation. This study evaluates respiratory distress syndrome in preterm infants in terms of frequency and relationship with factors such as gestational age, birth weight, gender, maternal age, and the effect of Dexamethasone in preventing this disorder; it is hoped that its results will be effective in reducing the problem in the region and the country, and make the necessary decisions to prevent this clinical situation in prenatal care. According to the Association of American Academy of Pediatrics, if an alive embryo weighing less than 2500 grams is delivered successfully, that labor is labelled 'preterm'; in 1972, the World Health Organization introduces gestational age as a criterion for the definition of preterm babies. According to the organization, preterm labor refers to delivery, which is born after the 20th week of pregnancy and before the completion of the 37th week of pregnancy. (4) A baby born as a result of such a delivery is preterm, and he/she might have to struggle with serious health challenges all through life.

The cause of respiratory distress syndrome in neonates:

The main cause of respiratory distress syndrome in newborns is the lack of surfactant in the baby's lung. The main components of surfactant are lecithin (disalmotyl phosphatidyl choline), phosphatidyl glycerol, apoproteins (SP-A, B, C, D) and glycerol (6). With increased uterine age, more phospholipid is produced and stored in type 2 alveolar cells. These agents are released into the alveoli and reduce the surface tension and help prevent collapse of the small airway at the tail end and help rehabilitate the lung after exhalation; however, the amount that is produced and secreted may not be adequate to meet the premature baby's demand. At 20 weeks of pregnancy, surfactant is present with high concentrations in the lung tissue

of the fetus, but it doesn't reach the level of the lung alveoli; it appears in amniotic fluid between 28 and 32 weeks (7). The amount of surfactant in the lung surface usually lasts after 35 weeks. Genetic diseases, although rare, can cause lung disorder. Disturbances in the protein C and B genes of surfactants, as well as the gene responsible for the transfer of surfactant from membranes (Transporter ABC3), often resulting in fatal and severe respiratory illness (8). The production of surfactants depends on the natural pH, temperature and perfusion. Asphyxia, hypoxemia, and pulmonary ischemia, especially in the case of hypovolaemia, hypotension and cold stress can inhibit the production of surfactants. Lung epithelial coating may be damaged by high concentrations of oxygen and the effects of respiratory equipment (used for treatment), resulting in a reduction in surfactant, alveolar atelectasis and intranasal edema. This reduces the flexibility of the lungs and requires more pressure to open the alveoli and small airways. In newborns with this syndrome, with the aperture lowering, the chest wall is pulled and the pressure inside the chest is negated, then the amount of pressure in the thoracic is limited, resulting in an appetite for atelectasis (9). The thoracic wall of the preterm baby is quite flexible against the collapse of the lungs. Then, at the end of the exhalation, the volume of the chest and lungs is close to the remaining volume, and atelectasis may occur. Therefore, the deficiency of production with the secretion of surfactant, along with small respiratory units and the flexibility of the chest wall, leads to prematurity of atelectasis in the baby's lungs. In this case, perfusion is established in the lung, but no alveoli conditioning occurs, and this results in hypoxia. Reducing lung flexibility, reducing tidal volume, increasing physiological dead space,

increasing respiratory function, and inadequate alveoli ventilation eventually lead to hypercapnia (10). Hypocampic hypoxia and acidosis causes the closure of the pulmonary arterial artery and increasing the right-to-left shunt from the occipital hole and the arterial duct and in the lung itself (11). Therefore, the baby needs to spend more energy during breathing to provide oxygen to the body, although oxygen may not be sufficient for the body. A fully term infant is also sometimes suffering from respiratory distress syndrome due to defective genes responsible for making surfactants.

Pathology:

Bold red lungs become purple, and get, somehow, to be quite similar to the liver. Microscopically, extensive atherosclerosis with congestion of the capillaries and intra-alveolar lymphocytes can be observed. A number of alveolar ducts, alveoli and respiratory bronchioles are coated with granular acidophilic membranes. Amniotic debris, intra-alveolar hemorrhage and interstitial emphysema also exist but are not consistent findings. If the baby is ventilated, there is a significant interstitial emphysema. In infants who die earlier than 6 to 8 hours after birth, mucous membrane is rarely observed (12).

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