

Neonatal Respiratory Distress Syndrome

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2-20-18

Abstract

Respiratory Distress Syndrome (RDS) is a condition mostly prevalent in preterm infants (with about 93% of cases being a result of a preterm birth), where the lungs do not produce an adequate amount of surfactant, a substance responsible for reducing the surface tension of fluid within the lungs, essentially making breathing easier. This makes breathing more difficult for the infant, resulting in reduced amounts of oxygen reaching the blood which may lead to several complications, ranging from patent ductus arteriosus to lung collapse. It may also lead to several lifelong complications, including chronic breathing problems (asthma or bronchopulmonary dysplasia), blindness, or brain damage.

Introduction

Respiratory Distress Syndrome is a syndrome common in preterm infants, where breathing is made difficult due to a lack of surfactant [4], a mixture of lipids and proteins that function to reduce the surface tension of liquids within the lung, being produced within the lungs of the infant [3]. Due to the nature of surfactant, the lack thereof creates a situation where when an infant exhales, its lungs may collapse since the substance is responsible for keeping an infant's lungs open to allow the flow of oxygen [5]. Neonatal RDS occurs mostly when an infant was born before 37-39 weeks, and can be exacerbated by cesarean section delivery. More than 93 percent of RDS cases in infants come from preterm births, and only just over six percent

originate from term infants [1]. More specifically, almost all infants born before 28 weeks develop RDS. Neonatal RDS can lead to more respiratory issues in life, such as development of asthma and BPD (bronchopulmonary dysplasia) [5].

Symptoms of Neonatal RDS

Symptoms of neonatal respiratory distress syndrome are often apparent shortly after birth, whether that be a matter of minutes or a matter of hours [4]. The symptoms of neonatal RDS include rapid or shallow breathing, sharp pulling of the chest during breathing, grunting sounds, flaring of the nostrils, and long pauses while breathing [5]. RDS may also lead to various complications involving the lungs and blood/blood vessels. For example, due to a lack of oxygen caused by RDS, a fetal blood vessel called the ductus arteriosus may not close as it is supposed to minutes to days after birth as part of the normal changes occurring to a baby's circulation [6]. This condition is called "patent ductus arteriosus" or PDA [5]. While this condition can affect full term infants, it is most common in preterm infants. Another complication that can be caused by RDS is atelectasis, or a partially to fully collapsed section/lobe of a lung, or pneumothorax, leakage of air from the lung into the chest cavity. Atelectasis may result in an even lower level of oxygen in the blood [7], only worsening the implications of existing RDS.

Prevention of Neonatal RDS

Since RDS is mainly a result of preterm births, taking steps to ensure a healthy pregnancy beforehand is the most effective way to prevent a baby from being born with neonatal respiratory distress syndrome [8]. However, the condition often manifests itself during or after birth, whether that be preterm or term. At that point, the doctor delivering the infant should determine whether the lungs of the baby are fully developed before performing a cesarean section delivery, as that would only exacerbate existing problems. The doctor of the pregnant mother may also provide corticosteroid medicine injections if they believe the mother may give birth too early. This medicine can speed up surfactant production in the fetus, and development of the lungs [8].

Prognosis of Neonatal RDS

Neonatal respiratory distress syndrome worsens for the first four days after birth, but if treated correctly conditions will improve after that [4]. Long-term effects can include chronic/ongoing breathing problems (asthma or BPD), blindness, or brain damage. However, in the most severe cases, infants with neonatal RDS may die, as the condition can lead to bleeding of the brain [9].

Conclusion

RDS is a syndrome found mostly in preterm infants where a substance known as surfactant is underproduced in the lungs of the infant. This creates problems for breathing, and may lead to serious complications immediately and throughout the infant's life. Some treatments for RDS have been found be related to bronchopulmonary dysplasia (BPD), which is a chronic lung disease also affecting preterm infants. While BPD is caused by use of a respirator, RDS may occur naturally in preterm infants, while both could possibly lead to similar chronic breathing issues.

References

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