

## **Prevention and Management of Respiratory Distress Syndrome: Current Practice in Bangladesh**

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### **ABSTRACT:**

**Objective:** To gather information regarding current practice for prevention and management of Respiratory Distress Syndrome among obstetricians and neonatologists. **Methods:** It was a survey type of cross sectional study where the participants were from different teaching/referral hospital across the country. **Results:** Out of 150 physicians, 46% physicians found preterm deliveries in 10-30% cases. Most of them (71.3%) preferred antenatal corticosteroid (ACS). Four doses of Dexamethasone 12 hourly were the preferred in 61.33%. The use of repeat dose of corticosteroid was found to be less common (56.7%). RDS was less common among the neonatologists (58%) and diagnosis was mainly done on clinical basis. Still, in comparison to other developed countries, surfactant was used occasionally by the neonatologists (34.7%). **Conclusion:** Respiratory Distress Syndrome is one of the most important causes of neonatal mortality of preterm LBW in the community. Therefore a common protocol based approach for prevention and management of RDS may prove critical which is currently not in practice uniformly.

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### **INTRODUCTION:**

Prematurity is a major cause of neonatal mortality and morbidity all over the world. Prematurity and low birth weight (LBW, < 2500 g) accounted for 16.5% of all infant deaths in 2005 and was the second leading cause of infant mortality<sup>1</sup>. Respiratory distress syndrome (RDS) is the most common cause of respiratory distress in preterm infants and occurs in nearly 50% of preterm infants born at less than 30 weeks of gestation<sup>2</sup>. With the advancement of Neonatal care, increasing

numbers of preterm babies are surviving but with new challenges of related morbidities.

Respiratory distress syndrome (RDS) of the newborn, also known as hyaline membrane disease, is a breathing disorder and a common problem of premature babies. In healthy infants, the alveoli, the small, air-exchanging sacs of the lungs, are coated by surfactant, which is a soap like material produced in the lungs as the fetus matures in preparation for birth. If premature newborns have not yet produced enough surfactant, they are unable to open their lungs fully to breathe<sup>3</sup>.

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Respiratory distress syndrome (RDS) affects about 1 percent of newborn infants and is the leading cause of death in babies who are born prematurely<sup>4</sup>. The risk of RDS rises with increasing prematurity. Babies born before 29 weeks of gestation have a 60 percent chance of developing RDS<sup>5</sup>, but babies born at full term rarely develop this condition. Maternal risk factors for preterm birth include previous preterm birth, low maternal body mass, poor prenatal care and poverty<sup>6</sup>.

Babies present with respiratory distress shortly after birth, which gradually increases in severity, then stabilizes and ultimately resolve within 5-7 days. Preventing premature births could nearly eliminate RDS. Several causes of premature birth are preventable by good prenatal care. If the birth cannot be delayed beyond 34 weeks, the mother should be given corticosteroid therapy before birth, which accelerates fetal lung maturation. High-risk and premature infants require prompt attention by a pediatric resuscitation team. Healthcare providers may deliver the baby and administer surfactant down the infant airways, either as soon as the premature baby is born or when RDS is diagnosed. The babies can be given respiratory support by mechanical ventilators with continuous positive airway pressure (CPAP) designed to prevent the alveoli from collapsing. Prevention and treatment of RDS involve a lot of efforts and costs in the NICUs. Therefore, this survey is designed to evaluate the current practice and experience of the clinicians in managing prematurity in the context of preventing RDS.

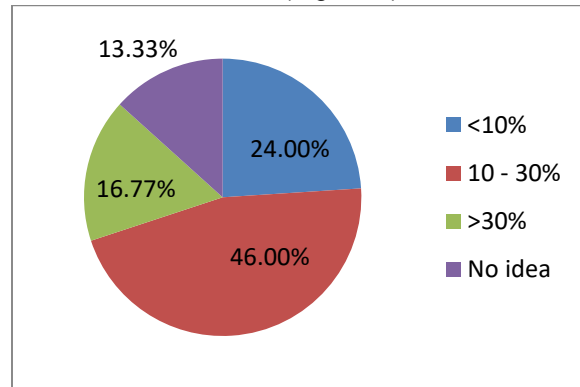
**METHODS AND METATERIALS:**

This cross sectional study was conducted on the spot during a national conference of Bangladesh Perinatal Society in December 2013. Specialists in neonatology, paediatrics, and Obstetrics working in different institutes across the country were requested to respond. A preformed questionnaire was supplied to participants, which include questions like how commonly they found prematurity as well as RDS in their centre, what measures they used to take for prevention of RDS. They were also asked on what basis they used to

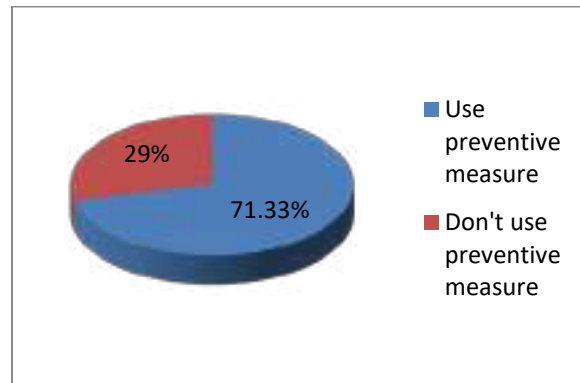
diagnose RDS and practice of giving surfactant in their institution. Answers were collected and results were calculated in percentages.

**RESULTS:**

A total of 150 physicians of the above mentioned disciplines participated in the survey. Among them 61.3% (92) were neonatologists. About 46% physicians found 10-30% cases of preterm deliveries in their institutions (Figure-1) and 71.33% of them used preventive measure for RDS like ACS, Dexamethasone (Figure-2).

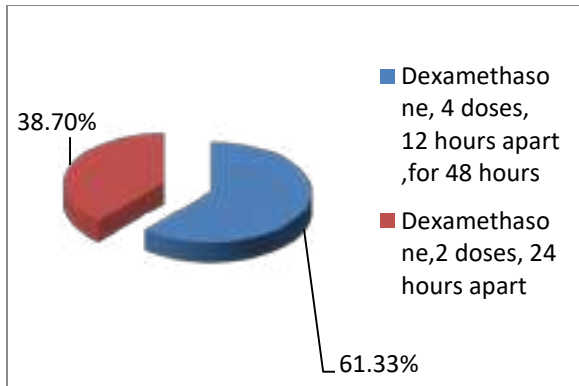


**Figure – 1: Incidence of Preterm Delivery**



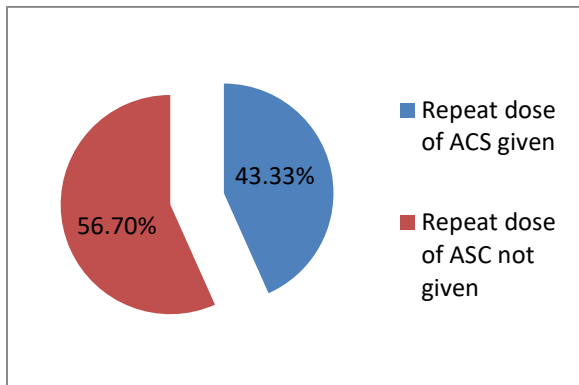
**Figure -2: Preventive measure for RDS**

About 38.7% physicians preferred four doses of Dexamethasone at 12 hours' interval for 48 hours (Figure-3).



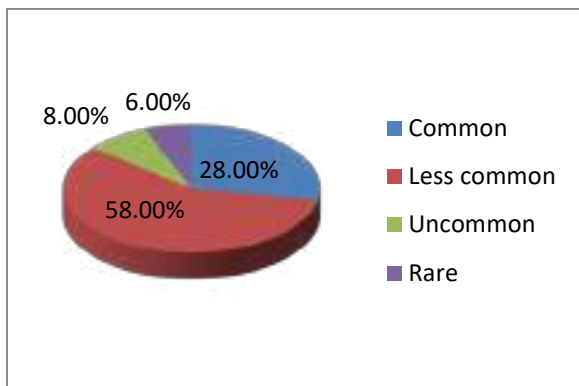
**Figure – 3 : dosage pattern used by the clinicians**

Fifty-seven percent physicians practiced of not giving repeat course of steroid if baby was delivered after 7 days (Figure-4).



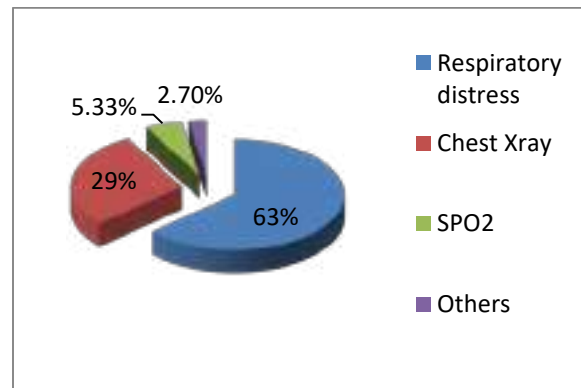
**Figure – 4 : Repeat dose of ACS**

For the neonatologists, RDS was found to be less common about 58% as shown in figure -5.



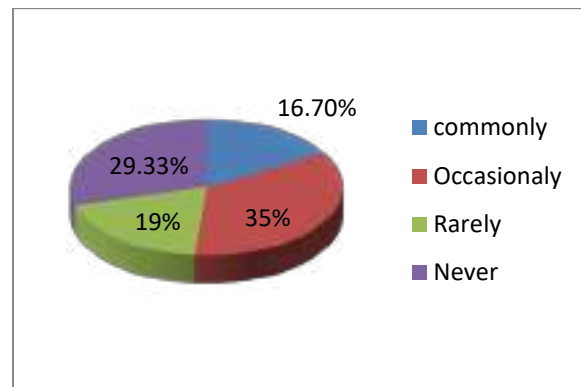
**Figure – 5: Severity of RDS**

Respiratory distress syndrome was diagnosed by them on the basis of signs of respiratory distress like tachypnoea, cyanosis, grunting, and crepitation on lungs auscultation. Sometimes they also considered Chest X-ray findings, O<sub>2</sub> saturation (Figure-6). Others (2.7%) included premature babies, infant of Diabetic mother, abnormal blood gas findings.



**Figure – 6: Diagnosis of RDS**

Though physicians in this conference belong with teaching hospitals of the country, but use of surfactant was still less, they used it occasionally (28%) shown in Figure-7.



**Figure – 7: Practice of surfactant among physicians**

**DISCUSSION:**

In the present study participation of neonatologists were found to be more. Majority of the physicians thought that preterm deliveries occurred about 10-

30% of the preterm babies in their institutions. Shah et al. in their Cohort study on preterm deliveries in Bangladesh found that 22.3% of the study population were delivered prior to 37 weeks of gestation (i.e. preterm) <sup>7</sup>. Antenatal corticosteroid as a preventive measure for RDS is preferred by 71.3% physicians like most of the studies. The 2006 Cochrane Review <sup>8</sup> stated in their conclusions that there is evidence to suggest benefit of Antenatal Corticosteroid (ACS) administration to a wide range of gestational ages from 26 to 34 weeks. This review also showed that RDS is reduced in all age subgroups above 26 weeks, and there is also a significant reduction in IVH and neonatal death in the subgroup from 26 to 29 weeks. In this survey 61.33% physicians were found to use corticosteroid, dexamethasone (4 doses, 12 hourly for 2 days). Dexamethasone & Betamethasone are the two most extensively studied steroid regimens, although there are no randomized trials directly comparing these two drugs. Both regimens were found to be equally effective for the prevention of RDS <sup>9</sup>. However, in one recent study, Lee et al. found that betamethasone was associated with a greater reduction in risk of death than dexamethasone, corroborating Jobe's results in 2004<sup>10</sup>. In our study, use of Dexamethasone was found, may be due to unavailability of Betamethasone in our country. This study reflected not using corticosteroid repeat dose (56.7%) if delivery does not occur in next 7 days. Early trials<sup>8,11,12</sup> on the use of ACS did not show any benefit in primary outcomes for infants born more than 7 days after steroid administration, especially, no reduction in the incidence of RDS or neonatal mortality was demonstrated. This lack of benefit led to a common practice of repeating courses or doses of ACS in a non standardized way<sup>13</sup>. Fifty-eight percent attending neonatologists thought that RDS was less common in their practice but worldwide it's incidence is high. In the 30 years studied the proportion of infants hospitalized with RDS increased from 1.9% to 3.8% of the whole neonatal population and from 30% to 53% of all infants admitted to a neonatal unit <sup>14</sup>.

Physicians diagnose RDS depending on features of respiratory distress like cyanosis in room air, grunting, tachypnea, low SPO<sub>2</sub> and chest X-ray

findings which is similar to many other studies<sup>15</sup>. In case of surfactant use, occasional users were found to be more (34.7%). On the other hand, a study conducted at Dhaka in 2008 where they used surfactant in 52% preterm babies of their study population<sup>16</sup> which was quite high.

This was a survey conducted in a conference where participants may be representative. The participants working in the referral hospitals predominantly participated in the study. Therefore, the actual scenario of RDS and its preventive strategies especially antenatal use of steroid and use of surfactant after diagnosis may be dissimilar at primary and secondary hospitals.

#### **CONCLUSION:**

Respiratory distress syndrome is one of the common morbidities in the neonatal practice. But the approach in the prevention and management of this common illness has not been found to be uniform. In the resource poor countries like Bangladesh, the criteria for diagnosis, antenatal use of steroid, use of surfactant postnatally should be based on a particular guideline. Moreover, the guideline should be strictly followed to prevent mortality from this commonly encountered problem.

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