Original paper

Prevalence and Etiology of Respiratory Distress in Newborns in the Fallujah Teaching Hospital for Women and Children

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Abstract

Background: A descriptive study was conducted in AL Fallujah Teaching Hospital for women and children to determine the prevalence and etiology of respiratory distress in the newborns delivered over the 6 months duration from 1st September 2018 to 1st March 2019.
Patients and methods: All live newborns delivered at AL Fallujah Teaching Hospital for women and children during the period of study were included and observed for development of respiratory distress.
Results: All newborns (n=5828), delivered at AL Fallujah hospital over the 6 months duration were observed for respiratory distress. The overall prevalence of respiratory distress was 2.5%. Prevalence was 54.4% in term and 42.2% in preterm and 3.4% in post term. Transient tachypnea of newborn was found to be the commonest 40.8% cause of respiratory distress followed by Hyaline membrane disease 34.7%, meconium aspiration syndrome 14.3%, congenital pneumonia 2% and other congenital anomalies 8.2%. Transient tachypnea of newborn was found to be common among term and near-term babies, while hyaline membrane disease was seen among preterm, and meconium aspiration syndrome among term and post term babies.
Conclusion: Respiratory distress is a common neonatal problem with significant morbidity and mortality. Transient tachypnea of newborn was a major cause followed by hyaline membrane disease and meconium aspiration syndrome.
Keywords: Newborn, Respiratory distress, Transient Tachypnea of Newborn,Hyaline Membrane Disease, Meconium Aspiration Syndrome.

Introduction

Respiratory distress is a major problem of ill-health in the newborn and reported in 20-50% of admissions in the neonatal care units in developing countries [1-3]. Respiratory distress is a common problem during the newborn period with considerable mortality. It accounts for nearly half of all deaths. It is a heterogeneous group of illnesses with varying prevalence, underlying etiology, clinical course and outcome[4]. Respiratory distress may be due to either medical or surgical cause[5]. Neonatal respiratory disorders account for most admissions to Neonatal intensive care units in the immediate newborn periods[6, 7].The aim of initial assessment of the infant in respiratory distress is to identify life threatening conditions that require prompt support, such as inadequate or obstructed airway (gasping, choking, stridor), apnea or poor respiratory efforts, cyanosis ,and circulatory collapse (bradycardia, hypotension, poor perfusion).
The physician should manage these infants promptly with immediate oxygen support and possibly bag and mask ventilation. Therefore, resuscitation equipment and supplies should always be available for immediate use in the delivery room [9].
Infants born by caesarean section at term are at increased risk for developing respiratory disorders compared with those born by vaginal delivery [11]. Over the past 20 years, there was an increase in the rates

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of elective caesarean delivery at term in the western world, largely due to management of previous caesarean section and breech presentation [9]. The prevalence of respiratory distress in infants admitted to the hospital increases due to increased rate of caesarean section [10]. The most common etiological cause of respiratory distress in neonate is transient tachypnea of the newborn; this is triggered by excessive lung fluids, and symptoms usually resolve spontaneously [11, 7, 16]. The hyaline membrane disease occurs in preterm infants due to deficiency of surfactant production from the lung. Treatment with oxygenation, surfactant replacement, and ventilation is often satisfactory. Antenatal corticosteroid treatment between 24 and 34 weeks gestation decrease the risk of hyaline membrane disease of the newborns [11]. Hyaline membrane disease is the most common cause of respiratory distress in the newborn, particularly, in preterm infants. It carries a high mortality rate and the prevalence is more than that documented in the Western world [12]. The mortality from respiratory distress can be reduced by the use of preventive measures such as antenatal steroid, appropriate intra partum care and attention to early stabilization after birth [13]. The wider spread availability of the basic intervention of oxygen and continuous positive airway would have the greatest impact of decreasing hyaline membrane disease specific mortality around the world [14]. Preterm babies at increased risk of hyaline membrane disease should be delivered in centers where appropriate facilities and expertise for its management are available [15]. Meconium aspiration syndrome can occur in utero due to fetal distress as a result of hypoxia. Treatment consist from resuscitation measures, oxygenation, replacement by surfactant, and ventilation. Other causes of respiratory distress include, pneumothorax, sepsis, pneumonia, persistent pulmonary hypertension, and congenital anomalies; treatment is disease specific [11].

Patients and Methods

In this descriptive study all live newborns delivered at Fallujah Teaching Hospital for Women and Children during the study duration from 1st September 2018 to 1st march 2019 were observed for respiratory distress and the objective was to determine the prevalence and etiological causes of respiratory distress in the newborns. Any newborn showing the following signs for more than two hours was considered to have respiratory distress. Tachypnea, increase chest in-drawing on respirations (subcostal, intercostals recessions) and grunting.

After the initial assessment and cardio respiratory management, a history was obtained. Maternal and obstetrical histories were taken which provided invaluable information. Intra partum details with special references to the fetal well being, duration of rupture of membranes, quantity and color of liquor, drugs especially analgesics and sedatives given to the mother were recorded. Apgar score, resuscitation details, sex, and gestational age based on last menstrual period date and clinical examination, birth weight and findings suggestive of respiratory distress were also recorded noted. All babies with respiratory distress were treated in the neonatal care unit. CBC, blood glucose, calcium and x-ray chest were obtained in all cases. Neonates with premature rupture of membranes, showing clinical signs of sepsis were also subjected to sepsis screening. Cranial ultrasound and echocardiography were done whenever indicated. All babies with respiratory distress undergo monitoring of vital signs and received appropriate treatment.

Data was recorded on a predesigned questionnaire. Data was analyzed using descriptive statistics.

Results

The total number of live births during the study period were 5828.The total number of spontaneous vaginal deliveries were 3715 and caesarean section deliveries were 2113. Out of all these cases 147 newborns developed respiratory distress. The males were 85 (57.8%) and females were 62(42.2%). Premature newborns were 62, full term newborns were 80 and post term were 5. The overall prevalence of respiratory distress was 2.5%. Prevalence of respiratory distress among preterm, term and post term were 42.2%,54.4% and 3.4% respectively. The major causes of respiratory distress are shown in Table1.

Transient tachypnea of newborn was found to be the commonest cause of respiratory distress (40.8%) and it was found to be the commonest cause or respiratory distress among both term and near-term babies. Hyaline membrane disease was the second commonest cause of respiratory distress (34.7%) and it was found in preterm babies. Meconium aspiration syndrome was the third commonest cause of respiratory distress (14.3%) and it was found in mature and post mature newborns. Congenital heart disease, congenital pneumonia, diaphragmatic hernia, tracheo-oesophageal fistulas were found in 5.4%, 2%, 1.4%, 1.4% of cases respectively.

Discussion

The overall prevalence of respiratory distress in this study was 2.5%. which are comparable with Indian studies that have reported prevalence between 0.7 % and 8.3% [(4)]. The prevalence of respiratory distress reported from Iran is 3.4% [(23)]. Other studies from developed countries have reported prevalence varying from 3% to 7% [(11), (17-22)]. The prevalence of respiratory distress is influenced by the geographical and ethnic factors, availability of neonatal intensive care unit and health care facilities. In this study the pattern of respiratory distress is similar to the studies from developed countries [(5,11)]. In studies conducted in India and Turkey the prevalence of transient tachypnea of newborn is 42.7% and >40% respectively [(4,22)]. which is also comparable to our results. Hyaline membrane disease is the commonest cause of respiratory distress in preterm newborns, due to immaturity of lung function. In our study the prevalence of respiratory distress among preterm was 34.7% which is comparable to those reported from developed countries which vary between 30% and 53% [(8)]. In a study from Aga Khan University Hospital, Karachi, Pakistan the prevalence of hyaline membrane disease is from 12.8% to 45% which is comparable with our study[(24)]. Meconium aspiration syndrome were found in term and post term in 14.3% of cases in our study which is comparable with results from developed countries which range from 10-16% of cases [(4,11)]. most cases were treated successfully and followed regularly. We did not find any study incompatible with our study.

Table1. Respiratory distress causes in newborns (n=147)

Diagnosis	Frequency	%
Transient tachypnea of newborn	60	40.8%
Hyaline membrane disease	51	34.7%
Meconium aspiration syndrome	21	14.3%
Congenital heart disease	8	5.4%
Congenital pneumonia	3	2%
Diaphragmatic hernia	2	1.4%
Tracheo-esophageal fistula	2	1.4%

Conclusion

Respiratory distress is a common neonatal problem with significant morbidity and mortality. Most of cases are result from transient tachypnea of newborn which is self-limiting disease and need only observation. Prevalence of hyaline membrane disease can be reduced by prenatal administration of corticosteroids and similarly cases due to meconium aspiration syndrome could be reduced by

improved antepartum, intrapartum care and the post-delivery resuscitation of newborn.

References

1. Kuti BP, Mohammed LO, Oladimeji OI, Ologun BG, Kuti DK,Fawale OO. Respiratory distress in Nigerian neonates: Prevalence, severity, risk, and etiological factors and outcome.Niger J Basic Clin Sci 2018;15:42-9.
2. Kommawar A, Borkar R, Vagha J,Lakhkar B, Meshram R, Taksandae A, study of respiratory distress in newborn. Int J contemp Pediatr 2017;4:490-4.
3. Adebami OJ, Joel-Medewase V, Agelebe E, Ayeni TO, Kayode OV,Odeyemi, et al. Determinants of outcome in newborns with respiratory distress in osogbo, Nigeria.IntJ Res Med Sci 2017;5:1487-93.
4. Kumar A, Bhat BV. Epidemiology of respiratory distress of newborns. Indian J Pediatr.1996;63:93-98.
5. Kumar A, Bhatnagar V. Respiratory distress in neonates. Indian J Pediatr. 2005; 72:425-428.
6. Aly H. Respiratory disorder in the newborn: identification and diagnosis. Pediatr. Rev.2004;25:201-208.
7. Pramanik A, Rangaswamy N., Gates T. Neonatal respiratory distress: a practical approach to its diagnosis and managements. Pediat Ciln N Am 2015;62:453-469.
8. Ersch J, Roth-Kleiner M, Baeckert P, Bucher HU. Increasing incidence of respiratory distress in neonates. Acta Pediatr.2007;96:1577-1581.
9. Kolas T, Saugstad OD, Daltveit AK, Nilsen ST, Oian P. Planned caesarean versus planned vaginal delivery at term: comparison of newborn infant outcomes. Am J Obstet. Gynecol. 2006;195:1538-1543.
10. Zanardo V, Simbi AK, Franzoi M, Solda G, Salvadori A, Travisanuto D. Neonatal respiratory morbidity risk and mode of delivery at term: influence of timing of elective caesarean delivery. Acta Pediatr.2004;93:643-647.
11. Hermansen CL,Lorah KN. Respiratory distress in the newborn. Am Fam Physician. 2007;76:987-994.
12. Ghafoor T, Mahmud S, Ali S, Dogar SA. Incidence of respiratory distress syndrome. J Coll Physicians Surg Pak. 2003;13:271-273.
13. Bhutta ZA, Yusuf K, Khan IA. Is management of neonatal respiratory distress syndrome feasibile in developing countries? Experience from Karachi (Pakistan). Pediatr. Pulmonol.1999;27:305-311.
14. Kamath BD, Macguire ER, McClure EM, Goldenburg RL, jobe AH. Neonatal mortality from respiratory distress syndrome: Lessons for low –resource countries. Pediatrics. 2011;127: 1139-1146.
15. Haque KN, Waheed KAI. Evidence based guidelines for the management of neonatal respiratory distress syndrome in Pakstan: Personal observations and Pragmatic opinion. Pak Paed J. 2010;34: 169-179.
16. Hermansen CL, Mahajan A. Newborn respiratory distress.Am Fam physician. 2015;92:994-1002.
17. Bonafe L, Rubaltelli FF. The incidence of acute neonatal respiratory disorders in Padova county: an epidemiological survey. Acta Paediatr. 1996;85:1236-1240.
18. Nilsen TF, Hokegard KH. The incidence of acute neonatal respiratory disorders in relation to mode of delivery. Acta Obstet Gynecol Scand. 1984;63:109-114.
19. Navaei F, Aliabadi B, Moghtaderi M, Kelishadi R. Predisposing factors, incidence and mortality of pneumothorax in a neonatal intensive care unit in Isfahan, Iran. Zhongguo Dang Dai Er Ke Za Zhi. 2010;12:417-420.
20. Le Ray C, Boithias C, Castaigne- Meary V, 1'Helias, Vial M,Frydman R. Caesarean before labour between 34 and 37 weeks: What are the risk factors of sever neonatal respiratory distress ? Eur J Obstet Gynecol Repord Biol .2006;127:56-60.
21. Yoder BA, Gordon MC, Barth WHJ. Late-preterm birth:dose the changing obstetric paradigm alter the epidemiology of respiratory complications? Obstet Gynecol. 2008;111:814-822.
22. Fedakar A, Aydogdu C. Clinical features of neonates treated in the intensive care unit for respiratory distress. Turk J Pediatr. 2011;53:173-179.
23. Dehdashtian M, Riazi E, Aletayeb MH. Influence of mode of delivery at term on the neonatal respiratory morbidity. Pak J Med Sci. 2008;24:556-559.
24. Bhutta ZA, Yusuf K. Neonatal respiratory distress syndrome in Karachi: Pediatr Perinat Epidemiol. 1997; 11:37-43.