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ORIGINAL ARTICLE

Maternal outcome & effect of bCPAP on preterm infants with Respiratory Distress- A Clinical Study

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***ABSTRACT*:**
Background: Respiratory distress syndrome is a breathing disorder of premature babies. Respiratory support is provided to neonates using Continuous Positive Airway Pressure (CPAP). **Materials & Methods:** The present study was conducted in the department of Gynaecology & Obstectrics. It comprised of sixty neonates with mild to moderate respiratory distress of both genders. Maternal outcome of neoborn, DOWNES score, ABG PH, ABG CO_2 was recorded. **Results:** There were 25 (41.7%) male child and 35 (58.3%) female child. The mean± SD gestational age in male child was 34.8± 2.2 weeks and 35.2± 2.4 weeks in female. The difference was non-significant (P> 0.05). The mean DOWNES score before CPAP was 5.98 and after CPAP was 3.34. The difference was significant (P< 0.05). The mean ABG PH before CPAP was 7.36 and after CPAP was 7.30. The difference was non- significant (P> 0.05). The mean ABG CO_2 before CPAP was 42.46 and after CPAP was 42.21. The difference was non- significant (P> 0.05). Three mothers had multiple births, 4 had PIH, 7 had PROM, 10 had maternal diabetes and 4 had MSAF. In 32 mothers, there were non- significant findings. **Conclusion:** B-CPAP is effective in the treatment of neonates who were suffering from respiratory distress. It resulted in significant reduction of DOWNES score in neonates with respiratory distress.
Key words: CPAP, DOWNES, Maternal.

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INTRODUCTION

Respiratory distress syndrome (RDS) of the newborn, also known as hyaline membrane disease, is a breathing disorder of premature babies. In healthy infants, the alveoli- the small, air- exchanging sacs of the lungs- are coated by surfactant, which is 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.[1] More than 50% of babies born at <31 weeks of gestation will develop respiratory distress syndrome (RDS). 80% of cases of neonatal pneumonia and most cases of neonatal sepsis are associated with respiratory distress. The risk of RDS rises with increasing prematurity. Maternal risk factors for preterm birth include previous preterm birth, periodontal disease, low maternal body mass, poor prenatal care, and poverty.[2]

Respiratory support in the form of intermittent positive pressure ventilation (IPPV) and surfactant treatment is the standard treatment for the condition. In the developed world, respiratory support is provided to neonates using either mechanical ventilation or Continuous Positive Airway Pressure (CPAP).[3] The bCPAP device consists of an adjustable flow generator, a pressure-regulator, and a patient interface. Two pumps provide continuous flow of room air. The output of an oxygen concentrator is connected to an input port on the device; two flow regulators adjust the flow rate and proportion of oxygen delivered. A pressure control tube submerged in a bottle of water controls end-expiratory pressure. The device delivers a mixture of pressurized air and oxygen at flow rates ranging from 0–10 L/min, pressures varying from 5–8 cm H_2O, and oxygen ranging from 21–65%.[4] The present study was conducted to assess the maternal outcome & effect of

bCPAP on immediate outcome of preterm infants with respiratory distress.

MATERIALS & METHODS

The present study was conducted in the department of Gynaecology & Obstectrics. It comprised of sixty neonates with mild to moderate respiratory distress of both genders. Parents were informed regarding the study and written consent was obtained. Ethical approval was obtained prior to the study. Inclusion criteria included neonates with gestational age 28 weeks to 36 weeks with RDS and neonates with mild to moderate respiratory distress based on Downe's score ($\geq 4 - \leq 7$).

In all neonates, baseline information such as age, gender, weight, gestational age, any resuscitation at the time of birth and Apgar score (1 min, 5 min and 10 min) was obtained. Clinical parameters such as heart rate (HR), respiratory rate (RR), temperature, CRT, SpO2 and blood pressure were also recorded. Downe's score was used for assessing the severity of RDS and grade it into mild / moderate / severe Respiratory Distress. Downe's score was used for evaluating the clinical improvement. Maternal history such as PIH, Diabetes etc was taken.

Statistical analysis was done with the statistical package for the social science system version SPSS 21.0. Data was represented as mean $\pm$ SD. The Pearson's chi-square test was used. $P<0.05$ was considered statistically significant.

RESULTS

Table I Distribution of patients

Male child	Percentage	Female child	Percentage
25	41.7	35	58.3

Table I shows that there were 25 (41.7%) male child and 35 (58.3%) female child.

Table II Gestational age in patients

Gender	Mean	SD	P value
Male Child	34.8	2.2	
Female Child	35.2	2.4	0.14

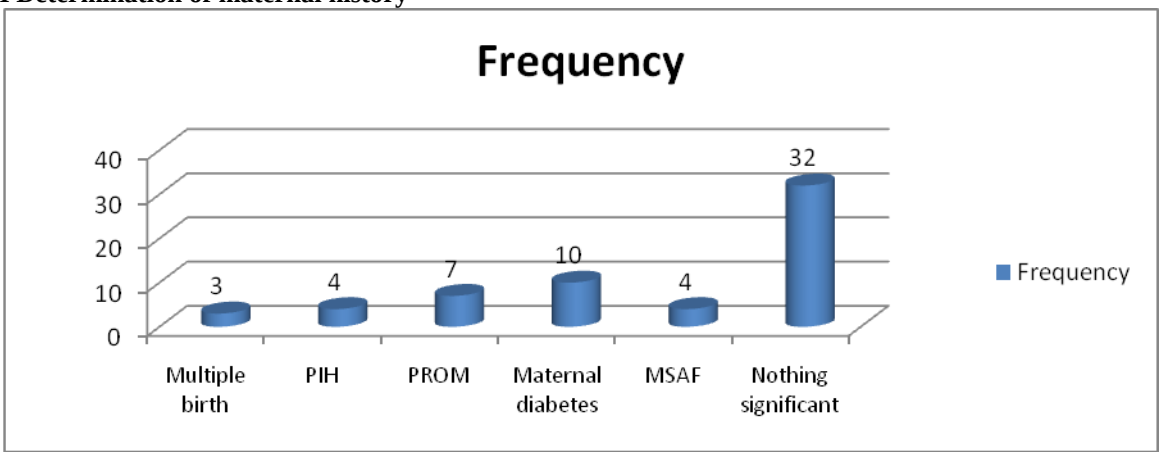
Table II shows that mean± SD gestational age in male child was 34.8± 2.2 weeks and 35.2± 2.4 weeks in female. The difference was non- significant (P> 0.05).

Table III Comparison of parameters before and after CPAP

Parameters	Before (Mean)	After (Mean)	P value
DOWNES score	5.98	3.34	0.01
ABG PH	7.36	7.30	0.51
ABG CO_2	42.46	42.21	0.12

Table III shows that mean DOWNES score before CPAP was 5.98 and after CPAP was 3.34. The difference was significant (P< 0.05). The mean ABG PH before CPAP was 7.36 and after CPAP was 7.30. The difference was non- significant (P> 0.05). The mean ABG CO_2 before CPAP was 42.46 and after CPAP was 42.21. The difference was non- significant (P> 0.05).

Graph I Determination of maternal history



Graph I shows that 3 mother had multiple births, 4 had PIH, 7 had PROM, 10 had maternal diabetes and 4 had MSAF. In 32 mothers, there were non- significant findings.

DISCUSSION

Respiratory distress in the newborn is recognized as one or more signs of increased work of breathing, such as tachypnea, nasal flaring, chest retractions, or grunting. Respiratory disease may result from developmental abnormalities that occur before or after birth. Babies born before 29 weeks of gestation have a 60 percent chance of developing RDS, but babies born at full term rarely develop this condition.[5] Neonates with respiratory distress may have nasal flaring, grunting, intercostal or subcostal retractions, and cyanosis. The newborn may also have lethargy, poor feeding, hypothermia, and hypoglycemia. RDS symptoms occur immediately after birth. The most common causes of respiratory distress in newborns are transient tachypnea of the newborn (TTN), respiratory distress syndrome (RDS), meconium aspiration syndrome, pneumonia, sepsis, pneumothorax, and delayed transition. Rare causes include choanal atresia; diaphragmatic hernia tracheoesophageal fistula; congenital heart disease; and neurologic, metabolic and hematologic disorders.[6]A careful history and physical examination are imperative in the evaluation of newborns with respiratory distress. Laboratory data can assist in the diagnosis. Glucose levels should also be measured because hypoglycemia can be a cause and consequence of respiratory distress. In present study we assessed the effect of bCPAP on immediate outcome of preterm infants with respiratory distress.

In present study, there were sixty neonates which comprised of 25 male child and 35 female child. Sandri et al[7] found 230 newborns of 28–31 weeks gestation having respiratory distress.

The mean± SD gestational age in male child was 34.8± 2.2 weeks and 35.2± 2.4 weeks in female. Sharba et al[8] in their study found that the mean gestational age was 30.67 ± 2.16 weeks. Sethi et al[9] in their study found that the mean gestational age of the study population was 32-34 weeks and birth weight was 1.501 g.

We found that mean DOWNES score before CPAP was 5.98 and after CPAP was 3.34. The difference was significant (P< 0.05). The mean ABG PH before CPAP was 7.36 and after CPAP was 7.30. The mean ABG CO_2 before CPAP was 42.46 and after CPAP was 42.21. Parasuramappa et al (2017)[10] found that at the start of CPAP 11%, 48% and 41% of babies had DS of 4, 5 and 6 respectively. We found that 3 mother had multiple births, 4 had PIH, 7 had PROM, 10 had maternal diabetes and 4 had MSAF. Yagui AC et al[11] found multiple birth in 33.6% and PROM in 5.2% cases.

The biggest risk factor for respiratory distress syndrome (RDS) is prematurity. 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 may 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.[12] In the management of such cases, Bubble Continuous Positive Airway Pressure (CPAP) is a well-established mode of respiratory support in preterm newborns.

CONCLUSION

Authors concluded that B-CPAP is effective in the treatment of neonates who were suffering from respiratory distress. It resulted in significant reduction of DOWNES score in neonates with respiratory distress.

REFERENCES

1. Hermansen CL, Lorah KN. Respiratory distress in the newborn. Am Fam Physician. 2007; 76(7):987-994.
2. Buckmaster AG, Arnolda G, Wright IM, Foster JP, Henderson-Smart DJ. Continuous positive airway pressure therapy for infants with respiratory distress in non tertiary care centers: a randomized, controlled trial. Pediatrics. 2007; 120(3):509-518.
3. Fedakar A, Aydogdu C. Clinical features of neonates treated in the intensive care unit for respiratory distress. Turk J Pediatr. 2011; 53(2):173-9.
4. Narendran V, Donovan EF, Hoath SB, Akinbi HT, Steichen JJ, Jobe AH. Early bubble CPAP and outcomes in ELBW preterm infants. J Perinatol 2003; 23:195-9.
5. Yoder BA, Gordon MC, Barth WH Jr. Late-preterm birth: does the changing obstetric paradigm alter the epidemiology of respiratory complications? Obstet Gynecol. 2008; 111(4):814-822.
6. De Klerk AM, De Klerk RK. Nasal continuous positive airway pressure and outcomes of preterm infants. J Paediatr Child Health 2001; 37:161-7.
7. Sandri F, Ancora G, Lanzoni A, Tagliabue P, Colnaghi M, Ventura ML, Rinaldi M, Mondello I, Gancia P, Salvioli GP, Orzalesi M. Prophylactic nasal continuous positive airways pressure in newborns of 28–31 weeks gestation: multicentre randomised controlled clinical trial. Archives of Disease in Childhood-Fetal and Neonatal Edition. 2004; 89(5):394-8.
8. Sharba SA, Umran RM, Jumaa A. Bubble Nasal CPAP in the Management of Respiratory Distress Syndrome (one year experience in low resources unit). Medical Journal of Babylon 2013; 10(4):809-16.
9. Sethi A, Mehta NJ, Surti BM, Gamit D, Tada N. Safety and effectiveness of bubble continuous positive airway pressure in neonates with respiratory distress and its failure factors. National Journal of Medical Research. 2015; 5(3):202-6.
10. Parasuramappa H, Belavadi G. A descriptive study on the use of bubble CPAP in a level 2 neonatal intensive care unit in Bangalore, India. Sri Lanka Journal of Child Health. 2017; 46(3):211-7.
11. Yagui AC, Vale LA, Haddad LB, Prado C, Rossi FD, Deutsch AD, Rebello CM. Bubble CPAP versus CPAP with variable flow in newborns with respiratory distress: A randomized controlled trial. Jornal de pediatria. 2011; 87(6):499-504.
12. Mohsen F, Sirin Mneimneh, Amal Naous and Mariam Rajab. Nasal/bubble CPAP versus mechanical ventilation for respiratory support in preterm infants at birth. EJBPS 2018; 5: 58-64.