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Study of clinical profile and outcome of nasal septal injury in neonates receiving oxygen therapy with nasal cannula & nasal prong, CPAP, NIPPV

[1] Dr. Dhaval Patel, [2] Dr. Nikhilesh Nain, [3] Dr. Mitul Kalathia

[1, 2] Resident, K.T children hospital, Rajkot, Gujarat, India
[3] Assistant Professor, K.T children Hospital, Rajkot, Gujarat, India

Abstract
Objective: To study neonatal variables affecting nasal septal injury among newborns receiving oxygen therapy.
Design: Prospective cross sectional study.
Setting: Tertiary care level.
Method: All newborns less than 37 week requiring oxygen therapy are included with proper consent and then daily examination was done to look for grade of injury and it is compared with variables of neonate such as gestational age, weight.
Result: Statically significant (p<0.05) relationship between low birth weight and duration of NIV with grade of injury.

Keywords: Nasal septal injury, nasal intermittent ventilation, CPAP

1. Introduction

Premature delivery is one of the determinants for morbidity and mortality. Intact survival of the newborn has increased in the recent past leading to increased burden of low birth weight neonates [1]. Non Invasive ventilation through CPAP and Nasal Prong is becoming cornerstone of therapy in neonates suffering from respiratory discomfort which is a major killer in preterm newborns at many services [2]. It is non-invasive mode of oxygen therapy with excellent outcomes particularly in preterm and low birth weight newborns in terms of survival.

Needless to say increased use of nasal devices has led to multifold increase in incidence of nasal injuries. Nasal prong is a simple device to deliver oxygen and continuous pressure ventilation available in different sizes and flexible material [3]. It exerts pressure on nostril which leads to hyperaemia, congestion, pain, lesions and other complications [4-5].

The global prevalence rates of nasal traumas range between 20 and 42.5%[6], reaching 85% to 100% in Brazil [6-7].

In addition to it the complete loss of nasal septum and disfigurement of nose has led to feelings of pain and anguishment in relatives [8].

So to address the above said issues this study is done to find incidence and prevalence of nasal injuries with different modes of nasal devices and to find out the appropriateness of the NIPPV [9].

2. Material & Methods

This is a prospective cross sectional study carried out at tertiary level NICU from January 2016 to march 2016. Study population consists of all newborns less than 37 weeks admitted at the centre during the three month tenure which were submitted to the Non Invasive Ventilation by CPAP, Nasal prongs or Nasal cannula and suffered nasal injury.

Total newborns admitted were 573 out of which 371 received oxygen therapy by Non Invasive Ventilation.

Study population totalled to 52 who suffered from any sort of nasal injury. All those who were shifted from one mode of delivery to another within 24 hours i.e. nasal prong to endotracheal or nasal prong to hood were excluded from the study. Patients with congenital anomaly of the nose, coagulation disorders and cleft lip and palate were also excluded from the study. To collect data these instruments were elaborated: age, sex, weight, maturity, mode of therapy and duration of therapy through a Performa.

The nasal septum integrity was assessed daily from the time of beginning of therapy till patient is weaned off the therapy. Nasal septum injury was graded according to European Pressure Ulcer Advisory Panel (EPUAP) [10] stage I–intact skin with non-blanch able redness; stage II–presence of ulcer or superficial erosion with partial skin loss and stage III–presence of necrosis and full skin loss.

To analyze the data software SPSS version 18 is used.

3. Results

Table 1: Relation between Gestational Age and Grade of Nasal Injury

S. No.	Maturity	No of Patients	Day 1 Grade				%	Day 2 Grade				%	Day 3 Grade				%
			0	I	II	III		0	I	II	III		0	I	II	III	
1	<30 WEEKS	11	0	11	0	0	100	1	5	5	0	90	7	1	3	0	36
2	30-32 WEEKS	22	3	19	0	0	90.5	10	11	1	0	57	20	2	0	0	0.5
3	33-34 WEEKS	12	4	8	0	0	66.6	5	3	4	0	58	8	4	0	0	33
4	35-36 WEEKS	7	3	4	0	0	50	5	2	0	0	33	7	0	0	0	0

$\chi 2 = 19.954$, p value= 0.0005 (df = 4)

Table 2: Relation between Weight and Grade of Nasal Injury

S. No	Weight	No of Patient	1 Day Grade				2 Day Grade				3 Day Grade			
			0	I	II	III	0	I	II	III	0	I	II	III
1	1-1.5 KG	31	1	30	0	0	9	15	7	0	24	4	3	0
2	1.6-2 KG	18	8	10	0	0	10	5	3	0	16	2	0	0
3	>2 KG	3	2	1	0	0	3	0	0	0	3	0	0	0

$\chi 2 = 15.787$, p value= 0.003 (df = 4)

Table 3: Relation between Duration of Oxygen Therapy and Grade of Nasal Septal Injury

S. No	Duration of Oxygen Therapy	No of Patient	1 Day Grade				2 Day Grade				3 Day Grade			
			0	I	II	III	0	I	II	III	0	I	II	III
1	1-2 DAYS	9	7	2	0	0	8	1	0	0	9	0	0	0
2	3-5 DAYS	34	2	32	0	0	11	19	4	0	30	3	1	0
3	>5 DAYS	9	0	7	2	0	2	1	6	0	3	4	2	0

$\chi 2 = 50.018$, p value= 0 (df = 4)

Table 4: Relation between Mode of Oxygen and Grade of Nasal Injury

S. No	Mode of Oxygen Therapy	No of Patient	Day 1 Grade				Day 2 Grade				Day 3 Grade			
			0	I	II	III	0	I	II	III	0	I	II	III
1	Nasal Cannula	12	8	4	0	0	8	4	0	0	12	0	0	0
2	Nasal Cannula & Cpap	40	3	37	0	0	12	18	10	0	31	6	3	0

$\chi 2 = 18.108$, p value= 0.000 (df = 2)

4. Discussion

- Table 1 shows significant relationship between gestational age and grade of nasal injury ($p < 0.05$) which differs from other studies [11-12]. This is because premature newborns require prolonged oxygen therapy.
- Table 2 shows significant injury ($p < 0.05$) in low birth newborns. Again this could be due to prolonged use of NIV [4].
- Table 3 & 4 shows very major significant relationship between duration of NIV and mode of NIV with grading of nasal injury [11].

5. Conclusion

This study concludes that Nasal Ventilation is major source of nasal septal injury. This injury depends on gestational age of neonate as premature baby require oxygen for more duration. Weight of baby, duration of NIV also affects the injury outcome.

6. References

1. Ministério da Saúde (BR). Secretaria de Atenção à Saúde, Departamento de Ações Programáticas e Estratégicas. Atenção à saúde do recém-nascido: guia para os profissionais de saúde Brasília: Ministério da Saúde, 2011.
2. Chowdhury O, Wedderburn CJ, Duffy D, Greenough A. CPAP review, Eur J Pediatr. 2012; 171:1441-8.
3. Squires AJ, Hyndman M. Prevention of nasal injuries secondary to NCPAP application in the ELBW infant Neonatal Netw. 2009; 28(1):13-27.
4. Yong SC, Chen SJ, Boo NY. Incidence of nasal trauma associated with nasal prong versus nasal mask during continuous positive airway pressure treatment in very low birth weight infants: a randomized control study, Arch Dis Child Fetal Neonatal. 2005; 90:480-3.
5. Pillow JJ. Which Continuous Positive Airway Pressure System is best for the Preterm Infant with Respiratory, Distress Syndrome? Clin Perinatol 2012; 39:483-96
6. Nascimento RM, Ferreira ALC, Coutinho ACFP, Veríssimo RCSS. The frequency of nasal injury in newborns due to the use of continuous positive airway pressure with prongs, Rev Latino-Am. Enfermagem, 2009; 17(4):489-94.
7. Ventura CMU, Alves JGB, Meneses JA. Eventos adversos em Unidade de Terapia Intensiva Neonatal, Rev Bras Enferm 2012; 65(1):49-55.
8. Günlemez A, Isken T, Gökalp AS, Turker G, Arisoy EA. Efeitos gel silicone nas injúrias nasais associado com o CPAP nasal Indian Pediatrics 2010; 47(3):265-7.
9. Arruda DC, Marcon SS. Experiência da família ao conviver com sequela decorrentes da prematuridade do filho, Rev Bras Enferm 2010; 63(4):595-602.
10. European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel. Prevention and treatment of pressure ulcers: quick reference guide. Washington DC: National Pressure Ulcer Advisory Panel, 2009.
11. Günlemez A, Isken T, Gökalp AS, Turker G, Arisoy EA. Efeitos gel silicone nas injúrias nasais associado com o CPAP nasal, Indian Pediatrics. 2010; 47(3):265-7.
12. Medeiros SK, Carvalho WB, Soriano CF. Practices of use of nasal intermittent positive pressure ventilation in neonatology in northeastern Brazil J Pediatr. 2012; 88(1):48-53.