

EVALUATION OF NEONATAL MORBIDITY IN PRETERM BIRTH INFANTS

ZAHID M^{*1}, TOUHEED U¹, AKHTAR N²

¹Department of Paeds Medicine, Bakhtawar Amin Hospital Multan, Pakistan

²Department of Obs/Gynae, Laeeque Rafiq Hospital Multan, Pakistan

*Correspondence author email address: drzahid123@yahoo.com

(Received, 14th December 2022, Revised 09th April 2023, Published 06th Jun 2023)

Abstract: *This study was designed to evaluate neonatal morbidities in late preterm births (38 weeks). A retrospective study was carried out in the hospital's Paediatrics & Gynecology and Obstetrics department from May 2022- May 2023. A total of 100 late preterm infants that were born alive and normal-term infants were selected for the final analysis. Patients were categorized into two groups; Group A consisted of late preterm infants, and Group B included normal-term infants. The data regarding mode of birth, presence of sepsis, APGAR score, jaundice, hypoglycemia, and weight loss was recorded in all infants. In group A, were more male patients than female patients (40 vs 10). In group B, the number of male and female patients was almost equal (26 vs 24). The difference in morbidities of both groups was significant ($p < 0.05$). The incidence of neonatal morbidities was greater in the late preterm group except for hypoglycemia which was observed in more patients in normal-term infants (8% vs. 10%). The APGAR score in the preterm group was less than in the normal term group at 1 minute (7.28 vs. 7.92) ($p = 0.69$) and at 5 minutes (8.38 vs. 8.65) ($p = 0.92$). Neonatal morbidities like respiratory diseases, jaundice, hypoglycemia, sepsis, and weight loss of more than 10% are common in late preterm infants.*

Keywords: Neonates, Preterm Birth, Morbidity, Infants

Introduction

Preterm infants are delivered before the completion of 37 weeks of pregnancy. Neonates born in this gestation age were generally believed to be at low risk; however, recent studies reported that infants born in late preterm (34-36 weeks) and early preterm (37-38 weeks) are at high risk of mortality and morbidity (Sharma et al., 2021; Vanin et al., 2019). The association of these risks with preterm birth or the causes of preterm delivery is still unknown.

In addition, late preterm infants are at higher risk of being admitted to the neonatal intensive care unit, increased length of hospital stay, and hospital readmission (Delnord and Zeitlin, 2019). Research has also found that these infants have a higher incidence of respiratory diseases, neurological disorders, temperature instability, necrotizing enterocolitis, sepsis, jaundice, and hypoglycemia (Algameel et al., 2020).

It is important to assess the morbidity risk in late-term births to assist healthcare providers in timely predicting and managing the risk during birth and hospital stays. This study was conducted to evaluate neonatal morbidity in late preterm births.

Methodology

A retrospective study was carried out in the Gynecology and Obstetrics department of the hospital from May 2022- May 2023. A total of 100 late preterm infants that were born alive and normal-term infants were selected for final analysis. The parents of the infants provided their consent for inclusion in the study. The ethical board of the hospital approved the study design.

Patients' demographic data were noted. Patients were categorized into two groups; Group A consisted of late preterm infants, and Group B included normal-term infants. In addition, data regarding mode of birth, presence of sepsis, APGAR score, jaundice, hypoglycemia, and weight loss were recorded in all infants.

SPSS analyzed all the data. A probability value < 0.05 was regarded as statistically significant.

Results

In group A, were more male patients than female patients (40 vs 10). In group B, the number of male and female patients was almost equal (26 vs 24). The difference in morbidities of both groups was significant ($p < 0.05$). The incidence of neonatal morbidities was greater in the late preterm group

except for hypoglycemia which was observed in more patients in normal-term infants (8% vs. 10%) (Table I). The APGAR score in the preterm group was less

than in the normal term group at 1 minute (7.28 vs. 7.92) ($p=0.69$) and at 5 minutes (8.38 vs. 8.65) ($p=0.92$) (Table II).

Table I: Comparison of morbidities between both groups

Morbidity	Group A (n=50)	Group B (n=50)	P value
Weight loss > 10%	4 (8%)	2 (4%)	0.05
Sepsis	2 (4%)	0	
Respiratory diseases	4 (8%)	2 (4%)	
Hypoglycemia	4 (8%)	5 (10%)	
Jaundice	2 (4%)	0	

Table II: Comparison of birth variables in both groups

Variable	Group A	Group B	P value
Gestation age (weeks)	35	38	0.89
Mode of birth			
Vaginal	40 (80%)	27 (54%)	0.05
Cesarean section	10 (20%)	23 (46%)	
APGAR score			
At 1 minute	7.28	7.92	0.69
At 5 minutes	8.38	8.65	0.92

Discussion

Late preterm infants are at high risk of mortality and morbidity than normal-term infants (Cheong et al., 2020). This is due to the immature physiological and metabolic system, although they don't vary significantly with respect to body weight from the term infants (Rysavy et al., 2021). They are at two to three folds at higher risk of developing infection, hypoglycemia, and jaundice and have higher readmissions after birth. Similarly, the mortality risk is enhanced four folds in late preterm birth infants until they turn 1 year (Souza et al., 2020). We conducted the study to evaluate neonatal morbidities in late preterm infants.

The results reported by Khowaja et al. (Khowaja et al., 2019) back the findings in our study. Of 363 late-term infants, 70.8% were diagnosed with at least one neonatal morbidity. In comparison, in 788 term infants, only 29.1% had neonatal morbidity. Similar to our study, the incidence of morbidity was many folds higher than in normal-term infants. The neonatal morbidities in this study were the same as noted in our study, i.e., respiratory diseases, need for ventilation, jaundice, hypoglycemia, and sepsis.

Another study also reported the high risk of morbidity and mortality in late preterm infants. The risk factors combined with the independent impact of late prematurity increases the risk by 7 times in late preterm births (Lee et al., 2020). Manuck et al. (Manuck et al., 2016), Brown et al. (Brown et al., 2014), and Iqbal et al. (Iqbal et al., 2013) also report the same results.

In Bartal et al. (Fishel Bartal et al., 2021), it is reported that preterm infants and term infants did not vary regarding the need for ventilation and mortality rate. But preterm infants had high rates of NICU admission, readmissions after discharge, hypothermia, and respiratory disorders. As in our study, the APGAR score at 1 minute (7.28 vs. 7.92) and 5 minutes (8.38 vs 8.65) varied significantly in both groups. The risk of morbidities decreased with the increase in gestation age.

Similar to our study, Mitha et al. (Mitha et al., 2021) also reported that preterm births had a risk of physiologic disorders, respiratory abnormalities, low Apgar scores, and severe and infectious morbidities. In comparison, term births were at significantly low risk of such morbidities.

There are some limitations of our study. Our sample size was small, the study period was also short, and we could not report long-term outcomes of late preterm birth. Multi-center studies with large sample sizes and longer follow-up periods can yield better results.

Conclusion

Neonatal morbidities like respiratory diseases, jaundice, hypoglycemia, sepsis, and weight loss of more than 10% are common in late preterm infants.

Conflict of interest

The authors declared absence of conflict of interest.

References

- Algameel, A., Elhawary, M., Amin, S., and Abd Elmenem, M. (2020). Outcome of late preterm newborns in Upper Egypt. *Egyptian Pediatric Association Gazette* **68**, 1-11.
- Brown, H. K., Speechley, K. N., Macnab, J., Natale, R., and Campbell, M. K. (2014). Neonatal morbidity associated with late preterm and early term birth: the roles of gestational age and biological determinants of preterm birth. *International journal of epidemiology* **43**, 802-814.
- Cheong, J. L., Burnett, A. C., Treyvaud, K., and Spittle, A. J. (2020). Early environment and long-term outcomes of preterm infants. *Journal of Neural Transmission* **127**, 1-8.
- Delnord, M., and Zeitlin, J. (2019). Epidemiology of late preterm and early term births—An international perspective. In "Seminars in Fetal and Neonatal Medicine", Vol. 24, pp. 3-10. Elsevier.
- Fishel Bartal, M., Chen, H.-Y., Blackwell, S. C., Chauhan, S. P., and Sibai, B. M. (2021). Neonatal morbidity in late preterm small for gestational age neonates. *The Journal of Maternal-Fetal & Neonatal Medicine* **34**, 3208-3213.
- Iqbal, N., Azhar, I. A., Ahmad, I., and Tayyab, M. (2013). A study of neonatal outcome associated with preterm birth in a tertiary care hospital. *Annals of King Edward Medical University* **19**, 231-231.
- Khowaja, W. H., Leghari, A. L., Hussain, A. S., Ariff, S., and Khan, I. A. (2019). Frequency and early complications of late preterm infants: A descriptive analysis from two secondary-care hospitals of Karachi. *Cureus* **11**.
- Lee, S. K., Beltempo, M., McMillan, D. D., Seshia, M., Singhal, N., Dow, K., Aziz, K., Piedboeuf, B., and Shah, P. S. (2020). Outcomes and care practices for preterm infants born at less than 33 weeks' gestation: a quality-improvement study. *Cmaj* **192**, E81-E91.
- Manuck, T. A., Rice, M. M., Bailit, J. L., Grobman, W. A., Reddy, U. M., Wapner, R. J., Thorp, J. M., Caritis, S. N., Prasad, M., and Tita, A. T. (2016). Preterm neonatal morbidity and mortality by gestational age: a contemporary cohort. *American journal of obstetrics and gynecology* **215**, 103. e1-103. e14.
- Mitha, A., Chen, R., Altman, M., Johansson, S., Stephansson, O., and Bolk, J. (2021). Neonatal morbidities in infants born late preterm at 35-36 weeks of gestation: a Swedish nationwide population-based study. *The Journal of Pediatrics* **233**, 43-50. e5.
- Rysavy, M. A., Mehler, K., Oberthür, A., Ågren, J., Kusuda, S., McNamara, P. J., Giesinger, R. E., Kribs, A., Normann, E., and Carlson, S. J. (2021). An immature science: intensive care for infants born at ≤ 23 weeks of gestation. *The Journal of pediatrics* **233**, 16-25. e1.
- Sharma, D., Padmavathi, I. V., Tabatabaai, S. A., and Farahbakhsh, N. (2021). Late preterm: a new high risk group in neonatology. *The Journal of Maternal-Fetal & Neonatal Medicine* **34**, 2717-2730.
- Souza, R. T., Costa, M. L., Mayrink, J., Feitosa, F. E., Rocha Filho, E. A., Leite, D. F., Vettorazzi, J., Calderon, I. M., Sousa, M. H., and Passini, R. (2020). Perinatal outcomes from preterm and early term births in a multi-center cohort of low risk nulliparous women. *Scientific reports* **10**, 1-11.
- Vanin, L. K., Zatti, H., Soncini, T., Nunes, R. D., and Siqueira, L. B. S. d. (2019). Maternal and fetal risk factors associated with late preterm infants. *Revista Paulista de Pediatria* **38**.



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. © The Author(s) 2023