



Effects of Less-Invasive Surfactant Administration on Respiratory Outcomes in Extremely Preterm Infants: A Multicenter Cohort Study in South Korea

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Abstract

Instruction : This study aimed to evaluate the effect of LISA on respiratory outcomes of extremely preterm infants in Korea.

Methods : Using the data from the multicenter prospective cohort, Respiratory outcomes including the BPD and respiratory dynamics on PND 7,14,28 were compared.

Results : LISA was associated with a significant reduction in moderate-to-severe BPD. LISA showed a trend with improving respiratory dynamics.

Conclusion : LISA appears to be an effective and safety approach for extremely preterm infants with spontaneous breathing at birth.

Introduction

- Previous studies have suggested that LISA may reduce the need for mechanical ventilation and the incidence of BPD [1-5].

- However, its acceptance and implementation vary across countries, particularly in extremely preterm infants [6-8].

- **This study aimed to evaluate the effect of LISA on respiratory outcome of extremely preterm infants in Korea.**

Methods

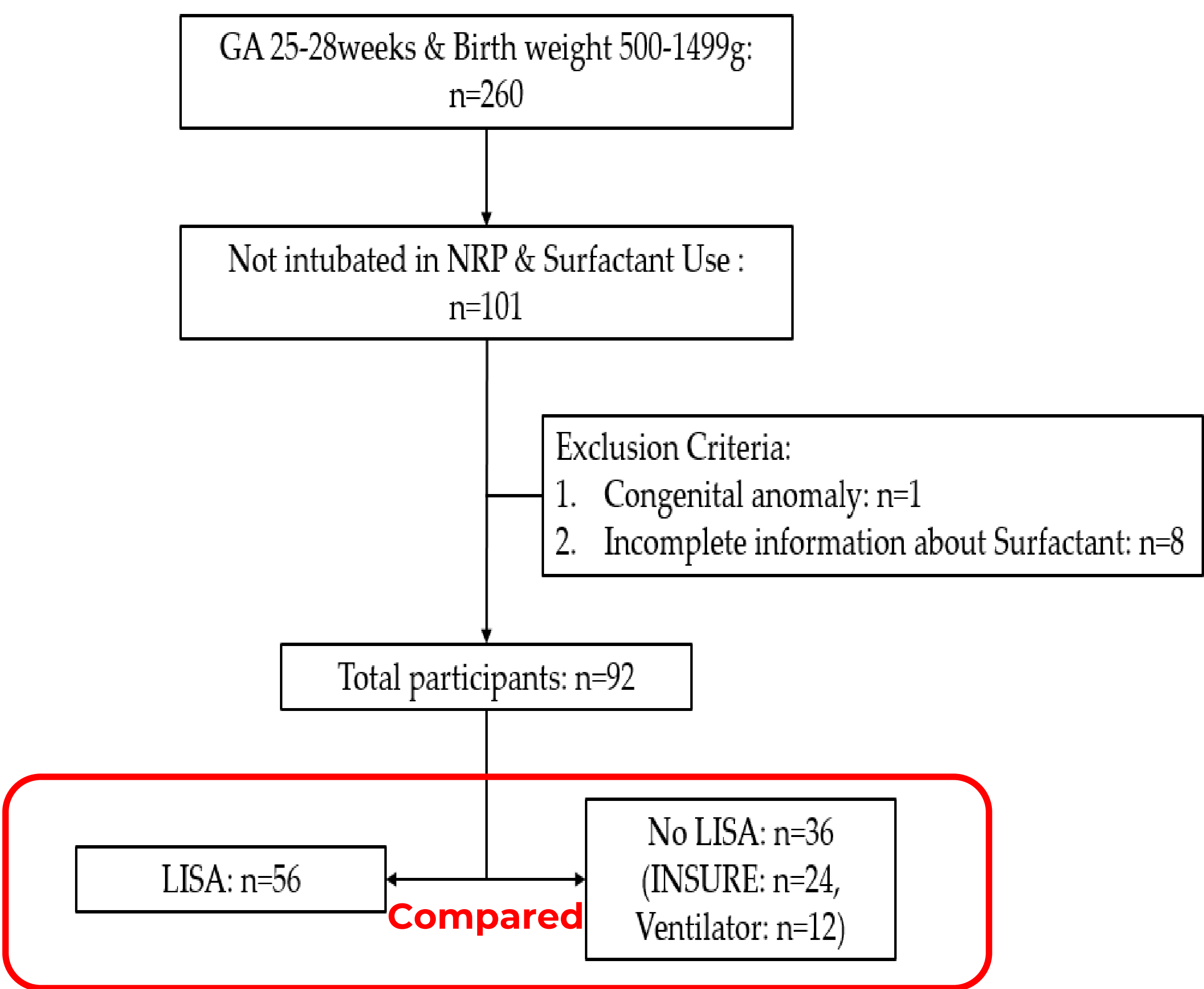
Design : Multicenter prospective cohort study (2022-2023)

E-PRO (Extremely Preterm Respiratory Outcome) Cohort:

- Aju University Hospital
- Asan Medical Center
- Chonnam National University Hospital
- Seoul National University Children's Hospital
- Seoul National University Bundang Hospital
- Samsung Medical Center
- Severance Children's Hospital

Study Participants :

<Figure 1> Flow chart of the study



Outcomes :

- **Primary Outcomes :**

- 1. Incidence of BPD at PMA 36weeks**
- 2. Incidence of Moderate-Severe BPD at PMA 36weeks**

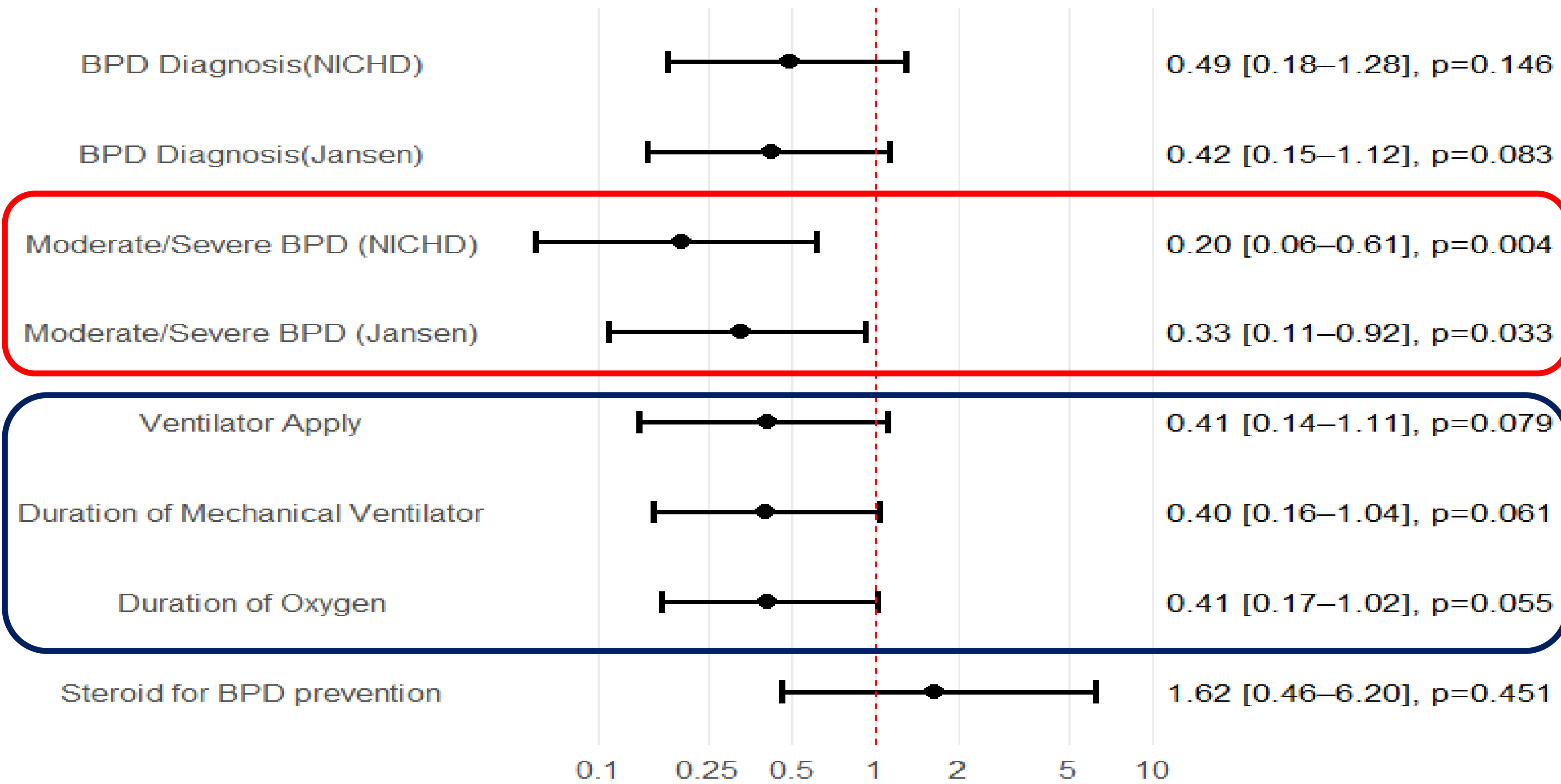
- **Secondary Outcomes :**

1. Total duration of Mechanical Ventilation (MV)
2. Use of MV & MAP at PND 7,14 and 28
3. Total duration of Oxygen therapy
4. Use of Oxygen & FiO₂ at PND 7,14,28
5. Use of postnatal steroid for BPD prevention
6. Mortality & Morbidity

Results

A comparison of perinatal characteristics between the two groups, LISA group had a higher proportion of infants born at 28 weeks' gestation than control (30(53.6%) vs 16 (44.4%)) without statistical significance. Birth weight of LISA and control was similar (1029.9±181.3 (g) vs 1001.9±198.2(g)). There was no difference in comparison of other perinatal risk factors.

<Figure 2> Forest Plot of LISA's effect on Respiratory Outcomes



LISA significantly reduced the risk of developing moderate-to-severe BPD. LISA also showed a trend toward reducing the need for mechanical ventilation and shortening the duration of ventilatory support and oxygen therapy.

<Table 1> Analysis of LISA and Respiratory Outcomes at PND 7,14 and 28

	PND 7	PND 14	PND 28
Use of Mechanical Ventilator†	0.56 [0.17, 1.90], 0.354	1.81 [0.52, 6.28], 0.351	1.06 [0.28, 4.05], 0.938
Use of Oxygen†	0.70 [0.15, 3.38], 0.660	2.10 [0.30, 14.55], 0.454	0.76 [0.11, 5.34], 0.784
MAP (cmH2O)‡	0.34 [-0.92, 1.61], 0.595	-1.57 [-3.02, -0.12], 0.034*	-0.75 [-3.43, 1.93], 0.581
FiO ₂ (%)‡	0.52 [-0.68, 1.72], 0.393	-1.25 [-3.27, 0.76], 0.224	-3.73 [-5.79, -1.67], <0.001*

LISA group showed a trend toward lower MAP and FiO₂ levels on PNDs 14 and 28, particularly with significantly lower MAP on PND 14.

In the comparison of mortality and morbidities, no significant differences were observed between the two groups for any analyzed outcomes (PDA treatment, Surgery for NEC or SIP, IVH and ROP)

Conclusion

In conclusion, this study demonstrated that

- **LISA can improve respiratory outcomes in extremely preterm infants who spontaneously breathe at birth.**
- **LISA was not associated with increasing mortality and other morbidities.**

Our findings contribute to a growing body of evidence supporting LISA as a safe and effective strategy for managing RDS in extremely preterm infants.

References

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