

Introduction of Less Invasive Surfactant Administration (LISA) to a Neonatal Intensive Care Unit (NICU)

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Background

LISA is administration of surfactant in a spontaneously breathing infant for the treatment of RDS by using a small catheter through the vocal cords. LISA has been demonstrated to reduce the risk of ventilation, in turn reducing adverse effects such as pneumothorax, barotrauma, laryngeal oedema and discomfort. Early surfactant therapy can also reduce the risk of IVH and BPD. In addition the procedure requires less or no sedation which reduces the risk of side effects from medication used for intubation.

Aim

To use a less invasive approach to administrate surfactant in preterm babies and record the incidence of intubation post procedure and complications.

Method

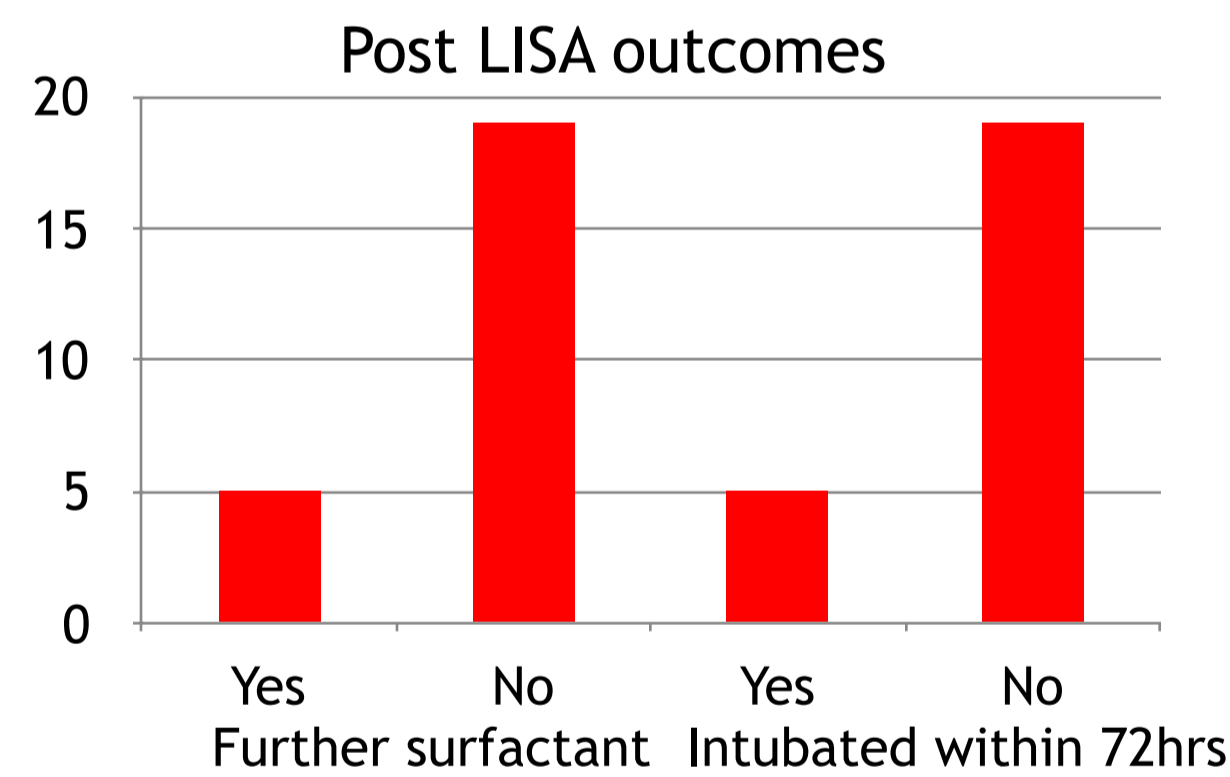
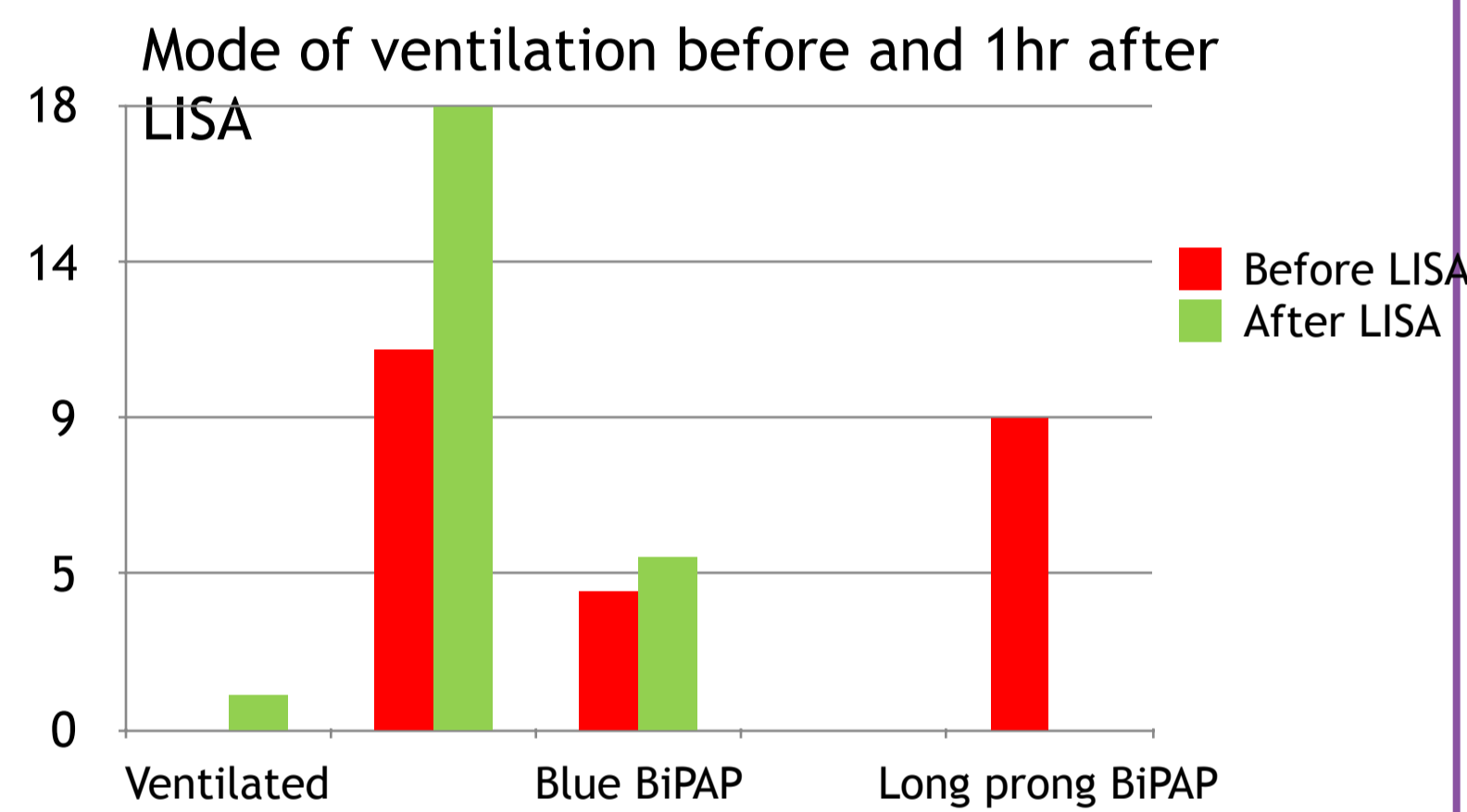
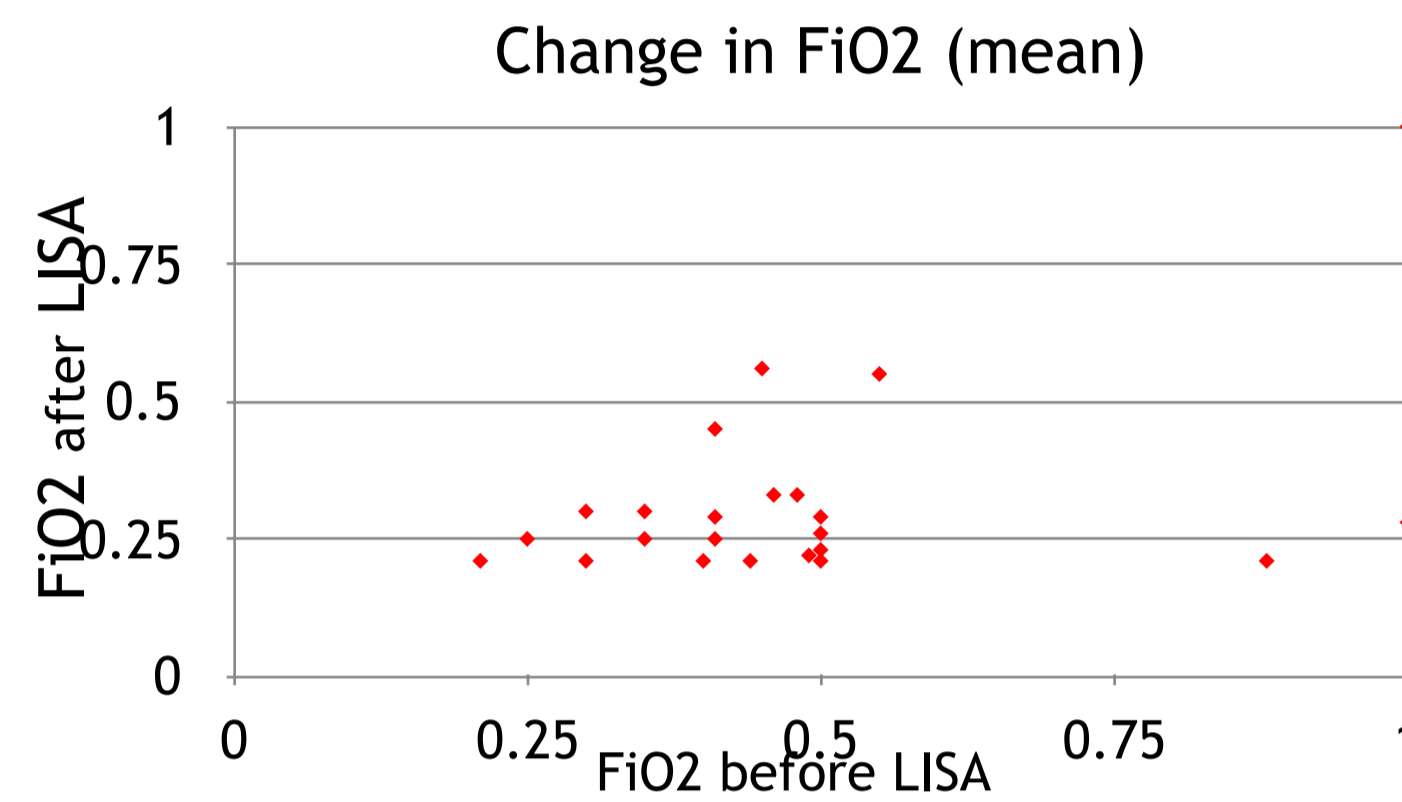
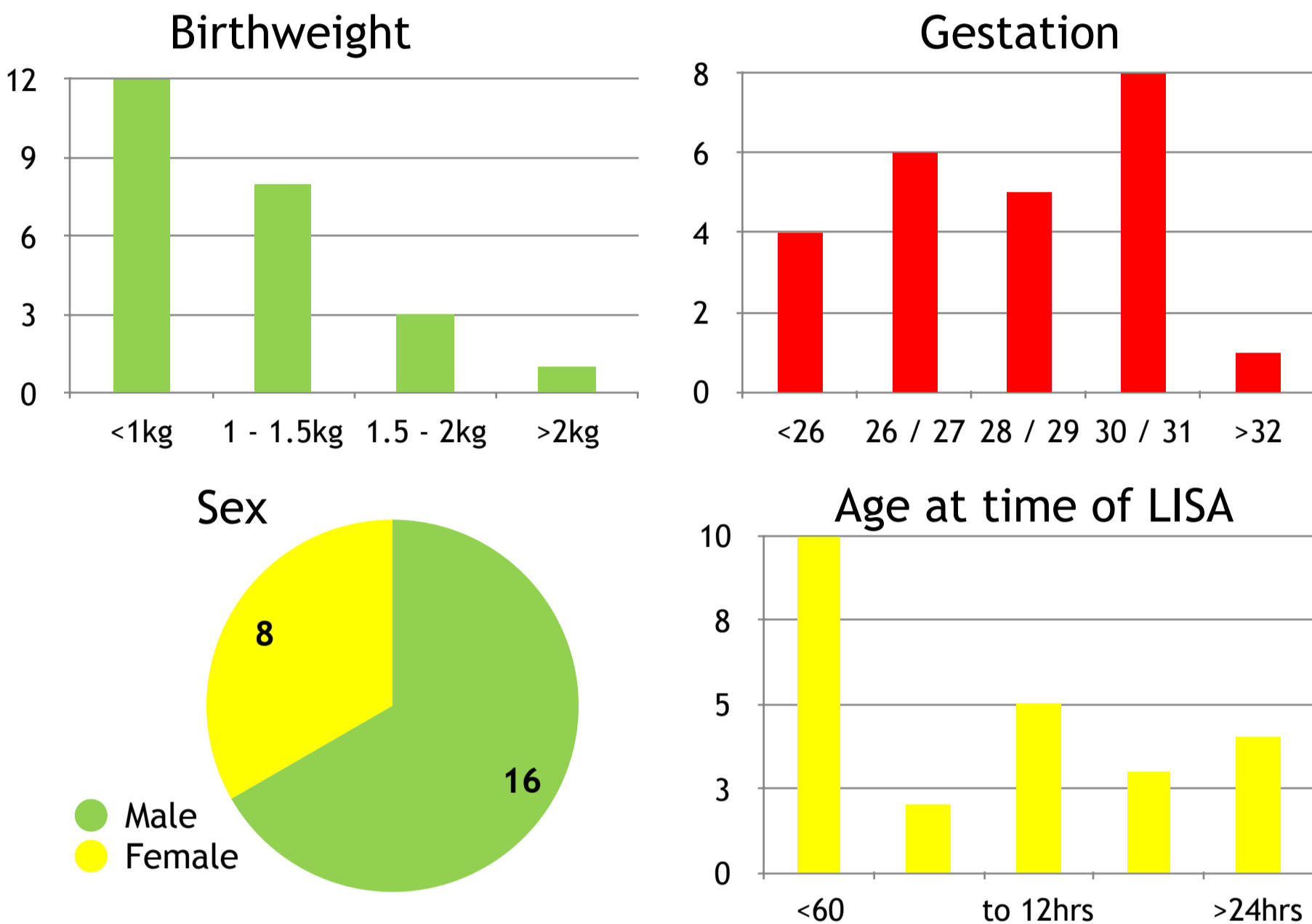
A record of LISA procedures performed was collected. Data was recorded during the procedure using a 'LISA checklist'. Data was collected retrospectively from the LISA checklist, patient notes and Badger. Data was input to excel for analysis.

A questionnaire was completed by those performing the procedure.

Patients intubated post LISA within 72 hours

All these patients had received antenatal steroids

- 24+1. BW 502g. FiO₂ 0.45 before, 0.56 after LISA. Temp 35.3°C after. Intubated 27 hours after LISA. Ventilated 25 days, NIV 17 days. Died from NEC on day 42.
- 28+3. BW 779g. FiO₂ 0.41 before, 0.45 after LISA. Temp 35.3°C after. Intubated 450 mins after LISA. Ventilated 30 days, NIV 20 days. PIE - 2 courses of DART. Repatriated on NIV.
- 30+1. BW 1485g. FiO₂ 0.55 pre and post LISA. Intubated 50 minutes after LISA. Ventilated 3 days. NIV 3 days. Early- pneumothorax. Late- lobar emphysema - resolved spontaneously
- 31+4. BW 1724g. Delivery room LISA at 35mins. FiO₂ 1.0 pre, 1.0 post. Intubated 60 mins after LISA. Ventilated 2 days, NIV 4 days. Uncomplicated stay.
- 29+3. BW 927g. Delivery room LISA at 13mins. FiO₂ 0.35 before and 0.3 after LISA. Temp 35°C after LISA. Intubated 93 mins after LISA. Ventilated 2 days. NIV 6 days. Oxygen for 48 days (CLD)



Results

Twenty four LISA procedures were performed over a one year period in babies ranging between 24+1 to 34+0 and weight 502-2690g. 41% (10 / 24) had LISA performed within an hour of birth 71% (17 / 24) of babies had an improved oxygen requirement following LISA. Mean oxygen reduction was FiO₂ 0.17. 20% (5 / 24) were intubated within 72 hrs post LISA. 60% (3 / 5) post LISA intubated babies also had significant temperature drops post procedure. All babies receiving fentanyl had naloxone post procedure, repeat naloxone doses were not required. Mean number of days ventilated was 4.1, days of NIV 15.3 and days requiring oxygen 5.8.

Mortality/Morbidity

1 patient died from NEC - 24+1, 502g. Required intubation 27 hours after LISA. Ventilated until day 25 of life. Died from NEC day 42.

6 patients had morbidity:

- 1 patient had pneumothorax and lobar pulmonary interstitial emphysema - was considered for lobectomy and home oxygen but improved and went home in air
- 3 patients had laser treatment for ROP
- 3 patients had CLD (1 patient also had ROP laser treatment)

Questionnaire responses

- Generally felt the procedure was easy to follow and the checklist helped.
- Some difficulty determining the length of the catheter past the cords.
- Fentanyl dose was reduced over time as it was felt to over-sedate.

Conclusion

LISA reduces the need for intubation in babies that otherwise would be intubated for surfactant administration. There was no pattern in patients requiring intubation after LISA, however hypothermia was common. Introduction with a guideline and checklist improved clinician experience.

Recommendations

- Use LISA checklist
- Maintain temperature control during the procedure.
- Educate staff in procedure. - include in induction, remind at huddles.
- Consider LISA early - stock LISA catheters in delivery room.

References:

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