Surfactant Therapy

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- **Surfactant therapy** improves survival and reduces pneumothorax and therefore plays an essential role in management of RDS.

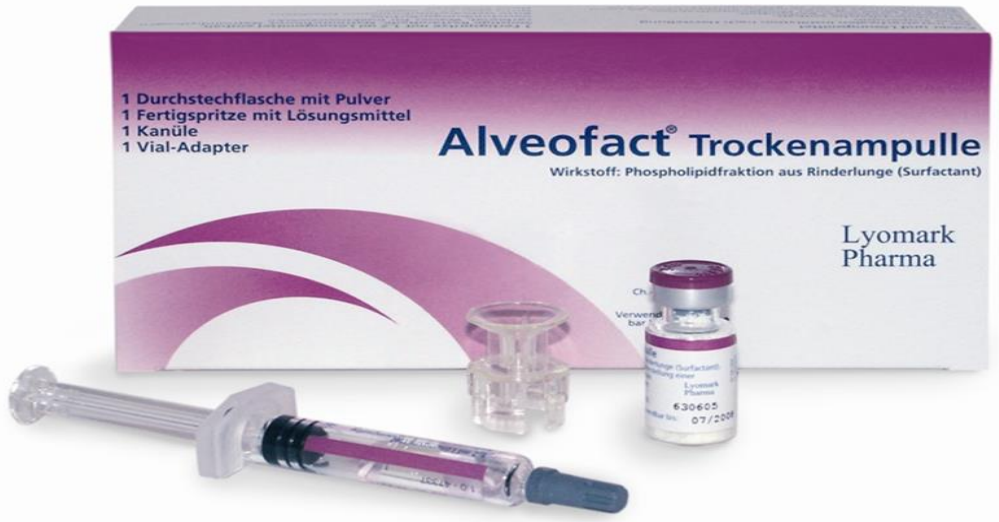
Types of surfactant

- **Natural** surfactants(animal sources)
- **Synthetic** surfactants(***lucinactant***)

Natural surfactants

- **Poractant alfa – Curosurf**

- **Bovactant - Alvefact**



- **Calfactant – Infasurf**

- **Beractant – Survanta**

- **Beractant- beraksurf**

- **Bovine lipid extract surfactant (*BLES*)**

When to Treat with Surfactant?

- If **intubation** is necessary as part of stabilisation for preterm infants, then surfactant should be given to promote early extubation.
- Suggested protocol would be to treat worsening babies with RDS when **FiO_2 > 0.30 on CPAP pressure ≥6 cm H_2O** or if lung ultrasound suggests surfactant need
- **Preterm infants with RDS** will develop progressively worsening lung disease, clinically presenting as increased *work of breathing*, *sternal recession*, and *increasing oxygen requirements* to maintain normal saturations.

- **MAS**
- **Pulmonary hemorrhage**

Contraindication

1. **Anomaly**
2. **Hemodynamic instability**
3. **Sever Pulmonary Hemorrhage**

Timing

- **Prophylactic**
- **Early Rescue**
- **Late Rescue**

- It is most effective when given within the **first two hours after birth**
- lower risk of *BPD* and *pulmonary air leak*

Repeat doses

- Infants who require an **FiO2 ≥0.30** to maintain SpO2 >90 percent remain intubated and receive additional doses of surfactant. Up to *three or four doses* can be given over 48 hours, no more frequently than every 12 hours.

- UPD

Surfactant Administration Methods

- Surfactant must be delivered directly to the trachea, and in most of the early trials, it was given as a **bolus** through an endotracheal tube.

Endotracheal intubation

- **Endotracheal intubation** has been the *standard technique* of surfactant administration.
- After intubation, surfactant is instilled through an end-hole catheter or through a secondary lumen of a dual-lumen endotracheal tube.Following instillation, positive pressure ventilation is provided..
- UPD

IN-SUR-E technique

- The **IN-SUR-E technique**, involving surfactant bolus administration followed by brief bag ventilation and rapid extubation without ongoing ventilation, seemed to reduce lung injury

Less Invasive Surfactant Administration(*LISA*)

- Administering surfactant using a **thin catheter** placed in the trachea under laryngoscopy
- The accepted best method is to use a **thin catheter** for surfactant administration and avoid "bagging" completely, allowing the infant to maintain spontaneous breathing on CPAP while surfactant is gradually instilled in small aliquots.
- The efficacy of MIST via thin intratracheal catheter is

supported by clinical trials and meta-analyses

- Results in less need for MV and a reduction in the combined outcome of *death* or *BPD* as well as reduction in *IVH*.
- Early rescue with LISA also has potential to reduce overall *costs* of care
- **Laryngoscopy** for LISA surfactant is undoubtedly uncomfortable, but there is more chance of apnoeic episodes post-procedure requiring PPV if *sedation* is used .

Minimally invasive surfactant therapy (MIST)

Alternative methods of getting adequate surfactant doses into the lung in a gentler way would be ideal.

- **Laryngeal masks** can be used to administer surfactant in babies.
- **Nebulization of surfactant**
- **Pharyngeal deposition** of surfactant

Equipment needed

1.French *feeding tube* No. 5

2. 5 or 10 ml *syringe*

3.Ventilator or bag

4. Sterile *gloves*

5.Tracheal intubation *equipment*

6.*Suction catheter*

Prescription

- **Control of vial** date&generic name
- **NG** length
- **CXR** location
- **Suction** once
- **Duration** 2-4 min
- **BP** hyptension
- **Temperature** hypothermia
- **HR**

Prescription

- **20 minutes** in **room air** or on warm **hands** for **8 minutes**
- **Do not warm**
- **Do not shake**
- The **needle** should not be inserted more than **once** into the vial

Post Prescription

- **Stay** at the patients bed
- Pulmonary **sounds**
- **ABG**
- **CXR** **4hr**
- Consider pulmonary **hemorrhage**
- **BP**
- Do not **suction** **4hr**

Complication

1. **Transient airway obstruction**
2. **Inadvertent instillation into only the right main stem bronchus**
3. **Oxygen desaturation**
4. **Pulmonary injury** due to volutrauma and barotrauma associated with intermittent PPV
5. **Pulmonary air leak**
6. **Airway injury** due to intubation

7.Bradycardia

8.Tachycardia

9.Reflux *small tube,inspiration*

10.Pulmonary hemorrhage *72hr*

11.Hypotension

12.PDA *18hr*

No response to surfactant therapy

1. **Extremely preterm**
2. **Asphyxia**
3. **Pulmonary edema**
4. **Pulmonary hypoplasia**

- In preterm babies receiving oxygen, the **saturation target** should be between *90 and 94%*
- **Alarm limits** should be set to *89 and 95%*

CPAP with **early rescue surfactant** is considered optimal management for babies with RDS

Temperature Control

- Maintaining **normal body temperature** is an important quality measure as hypothermia is associated with worse outcomes.
- In newborn preterm infants, immediate wrapping in a **polythene bag** or foil, placement under a **radiant warmer**, and **humidification of gases** are proven effective measures for reducing heat loss.

- After admission, babies should be managed in **servo-controlled incubators,** initially with relatively high humidity.
- Periods of **skin-to-skin care** are also an effective means of maintaining temperature.