The effect of respiratory diseases in preterm infants on sleep problems, habits and characteristics

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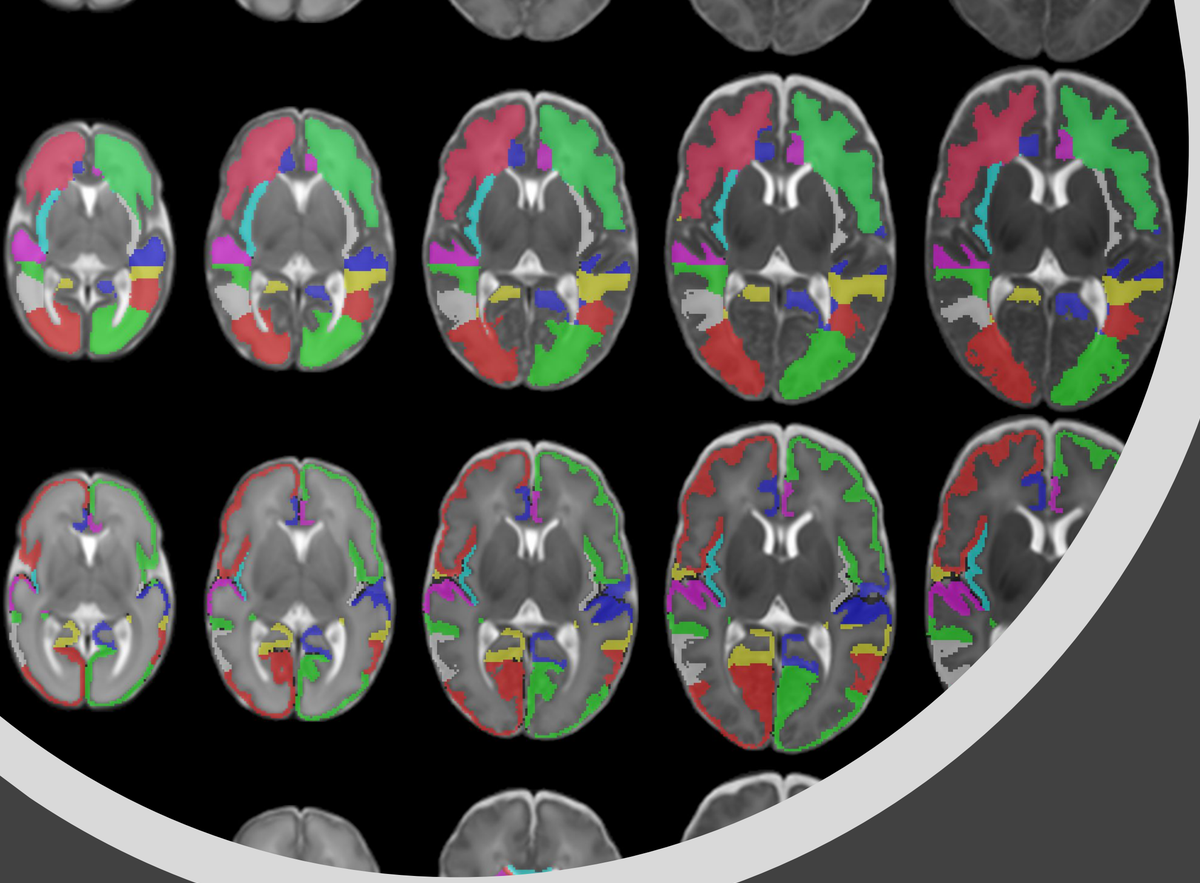
Lal Okay



The Importance of Sleep

Sleep and established sleep cycles in neonates and infants ➡ essential for;

- the structural development of;

a) Pons
b) Midbrain
c) Brainstem

- Thermoregulation
- Preservation of brain plasticity
- Creation of long-term memory circuits

in addition to neurosensory and motor development.

Preterm birth

- Global preterm birth rate → %11 or 15 million
- Risk of impaired brain development
- NICU (Neonatal Intensive Care Unit light, noise, frequent invasive procedures

↓

long-term neurodevelopmental outcomes

Sleep in Preterm Infants

Studies indicate that sleep disturbances in preterms such as;

- Daytime rest ⬇
- Sighttime sleep duration ⬇
- Sleep quality ⬇

persist through the second year of life.

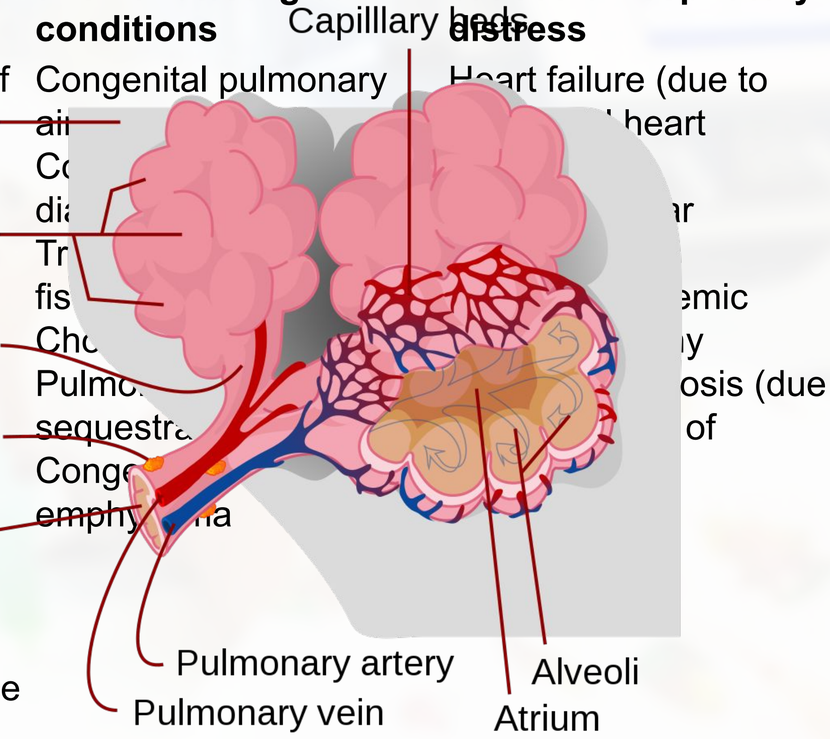
In a study, caregivers of preterm neonates more frequently proclaimed that their infants had sleep problems, loud noisy breathing and nighttime awakenings compared to caregivers of full term neonates.

The study also confirms preterm infants having a greater apnea-hypopnea index even after six months.

Respiratory Diseases of Preterm Infants

Respiratory diseases are common in preterm infants, especially those born under 32 week of gestational age because of inadequate surfactant production which keeps the alveoli in the lungs expanded

Preterm pathology	Term pathology	Congenital anomalies/surgical conditions	Non-respiratory causes of respiratory distress
Respiratory distress syndrome	Transient tachypnoea of the newborn	Congenital pulmonary	Heart failure (due to heart
Pneumothorax	Respiratory distress syndrome	Co	
Pneumonia	Meconium aspiration	dia	ar
Pulmonary haemorrhage	Primary or secondary	Tr	
Aspiration	persistent pulmonary	fis	emic
Pleural effusion (chylothorax)	hypertension of the newborn	Cho	y
Chronic lung disease	Pneumonia	Pulmo	osis (due
	Pneumothorax	sequestra	of
	Aspiration	Conge	
	Pleural effusion (chylothorax)	emphy ma	
	Pulmonary haemorrhage		
	Surfactant protein deficiency syndromes		
	Alveolar capillary dysplasia		



Respiratory Diseases of Preterm Infants

Emergency treatment for these diseases may require noninvasive respiratory support, such as

- Continuous positive airway pressure (CPAP)
- High flow therapy
- Tracheal intubation
- Mechanical ventilation in the most severely affected cases.

Hypothesis

Our hypothesis are:

a) Preterm infants who suffered from respiratory causes during their NICU stay have worse sleep quality between 6 to 24 months in comparison with preterm infants who didn’t suffer from respiratory diseases and full term infants who never stayed in the NICU

b) Each respiratory disease affects sleep differently

c) Each type of respiratory intervention have different effects on sleep;

d) The earlier the gestational week poorer sleep infants get

Methodology

Cross-sectional study

150 infants between 6 and 24 months of age in each of the 3 groups

Control group (Healthy Full-term)	Preterm - Respiratory disease	Preterm + Respiratory disease

For all 3 groups, children with a genetic syndrome, major congenital anomalies, neurosensory or motor disabilities, central sleep apnea, restless leg syndrome, epileptic diseases will be excluded from the study.

The data will be collected online using Survey Monkey forms on the basis of voluntary response sampling.

Methodology

Revised Brief Infant Sleep Questionairre (BISQ-R)

Sleep Disturbance Scale for Children (SDSC)

Researcher’s Questionnaire

- ★ The gestational week of infants
- ★ Length of NICU stay
- ★ Respiratory diseases they suffered from
- ★ Respiratory interventions performed during their stay and the length of their duration.
- ★ If the babies suffer from the diseases in the exclusion criteria
- ★ The city infants recieved treatment in and the type of hospital
- ★ If the infant still suffer with apnea
- ★ If the infant ever get infected with COVID

Methodology

To generate a %95 confidence interval and a power of %90 (0.15 average difference, 0.40 standard deviation) a minimum of 130 patients for each group is required. Data was collected online using Survey Monkey forms on the basis of voluntary response sampling.

- ★ For multiple-group comparisons → Kruskal Wallis test
- ★ Mann-Whitney u test → two group comparisons
- ★ The Chi-Square Test → categorical variables.
- ★ For the descriptive statistics aritmetic mean, standard deviation, frequency distribution and percentage will be presented
- ★ $p < 0.05$ was considered statistically significant

Results

Length of stay in the NICU and lower gestational week were not found to have a statistically significant correlation with sleep disturbances (p=0,13) in healthy preterms. However, among infants that suffered from respiratory diseases it was observed that lower gestational week was correlated with higher rates of sleep disturbances (p=0,029).

Results

Infants that suffered from pleural effusion were more likely to have disturbed sleep (p=0,028). Sleep scores of all 3 groups were similar, but caregivers of preterm infants perceived sleep to be less of a problem compared to healthy term babies.

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Thank you!