PHOTOTHERAPY

Done by:
Mrs. Divya MSc (N)

“HEAL US TO HEAL OTHERS”
Out lines

• Definition of Phototherapy
• Prevalence
• Mechanism of Phototherapy
• Types & causes
• Investigations
• Nursing Care for Infant Receiving Phototherapy.
• Minor Side Effects of Phototherapy
Objectives

1. Define phototherapy
2. Explain the prevalence
3. Understand the mechanism of phototherapy.
4. Listout types & causes
5. Explain the investigations
6. Apply the nursing care for infant’s receiving phototherapy
7. Enumerate the side effects of phototherapy
Definition of Phototherapy

Application of fluorescent light to the infant’s exposed skin.
Prevalence of neonatal jaundice

65% of term newborns develop clinical jaundice in first week

80% of preterm infants
MECHANISM OF WORKING
PHOTOCHEMICAL REACTIONS

LIGHT $\rightarrow$ BILIRUBIN ABSORBS PHOTON $\rightarrow$ 'EXCITED' BILIRUBIN $\downarrow$ PHOTO-OXIDATION $\downarrow$ STRUCTURAL ISOMERIZATION (LUMIRUBIN) $\downarrow$ CONFIGURATIONAL ISOMERIZATION (4E, 15Z, 4Z, 15E AND 4E, 15E PHOTOISOMERES)

"HEAL US TO HEAL OTHERS"
PHOTO-OXIDATION

SINCE CREMER’S REPORT (1958), IT HAS BEEN ASSUMED THAT PHOTO-OXIDATION IS THE MECHANISM FOR ↑ BILIRUBIN EXCRETION

1984, ISOMERE FORMATION FOUND TO BE THE MAJOR MECHANISM
RATE OF FORMATION & ELIMINATION OF BILIRUBIN

RATE OF FORMATION: 4Z, 15E ISOMERES > LUMIRUBIN > PHOTO-OXIDATION PRODUCTS

RATE OF EXCRETION: LUMRUBIN > 4Z, 15E > PHOTOOXIDATION PRODUCTS

LUMIRUBIN APPEARS TO BE THE MAJOR FORM OF ELIMINATION
Bilirubin metabolism
Types of neonatal jaundice

Bilirubin exists in two main forms in serum

**Unconjugated** bilirubin reversibly bound to albumin

**Conjugated** bilirubin readily excretable via the renal and biliary systems
Causes of neonatal jaundice

Best classified by age of onset and duration:

**Early:** within 24 hrs of life .1

**Intermediate:** 2 days to 2 weeks .2

**Late:** persists for >2 weeks .3
Causes of neonatal jaundice

<table>
<thead>
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<th>Late/prolonged</th>
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<td>• Crigler-Najjar syndrome (glucuronyl transferase absent/reduced)</td>
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# Causes of neonatal jaundice

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"Heal us to heal others"
Investigations for early jaundice

- Serum bilirubin level
- FBC and film
- Blood group
- Maternal blood group
- Direct coombs test
- Consider G6PD level
When to start phototherapy?

Kramer's rule

<table>
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<th>Zone</th>
<th>Jaundice</th>
<th>Serum indirect bilirubin (μmol/l)</th>
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<tr>
<td>1</td>
<td>Limited to head and neck</td>
<td>Average 100</td>
</tr>
<tr>
<td>2</td>
<td>Over upper trunk</td>
<td>150</td>
</tr>
<tr>
<td>3</td>
<td>Over lower trunk, thighs</td>
<td>200</td>
</tr>
<tr>
<td>4</td>
<td>Over arms, legs, below knee</td>
<td>250</td>
</tr>
<tr>
<td>5</td>
<td>Hands, feet</td>
<td>&gt;250</td>
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Phototherapy

Biliblanket

Phototherapy lights

“HEAL US TO HEAL OTHERS”
Nursing Care for Infant Receiving Phototherapy.

1- Assure effective of phototherapy
2- provide eye protection.
Nursing Care for Infant Receiving Phototherapy Cont’

3. Proper covering and shielding of gonad.
4. Assess skin exposure.
5. Proper position.
Nursing Care for Infant Receiving Phototherapy Cont’

6. Assess and adjust thermoregulation device.
7. Promoting elimination and skin integrity.
8. Hydration.
Nursing Care for Infant Receiving Phototherapy Cont’

10. Monitoring bilirubin level.
Minor side effect of phototherapy

2. Loss, greenish stool.
3. Transient skin rashes.
4. Hyperthermia.
5. Increasing metabolic rate.
6. Dehydration.
7. Electrolyte disturbance.
SUMMARY

PHOTOTHERAPY- EFFECTIVE TREATMENT FOR NEONATAL JAUNDICE

MECHANISM-IS WELL DEFINED

ACUTE EFFECTS ARE KNOWN AND MANAGEABLE

NO SIGNIFICANT ADVERSE OUTCOMES IN TERM INFANTS

SOME LINGERING CONCERNS IN LBW INFANTS-NEED FURTHER INVESTIGATION
“HEAL US TO HEAL OTHERS”
Shhhhhhhhhhhhh

.. I want sleep

THANK YOU FOR YOUR ATTENTION

“HEAL US TO HEAL OTHERS”