Association between weight change and hyperbilirubinemia in newborns

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Introduction

Introduction

- **Hyperbilirubinemia** or **Jaundice** is the condition of raised level of serum bilirubin from normal range.
- Yellow discoloration of the skin and sclera: Results from accumulation of bilirubin in the skin and mucous membranes.
- **60% of term** and **80% of preterm** newborns develop jaundice in the first week of life.
- **25-50 % of infants in Thailand** had high serum bilirubin level.

Complication of Jaundice

- **High unconjugated bilirubin**
  - Neurotoxic agent
  - Cause of death in newborns
  - Lifelong neurologic sequelae in infants who survive.

- **Hyperbilirubinemia can cause**
  - Acute bilirubin encephalopathy
  - Kernicterus

Ariel A Salas et al. Significant weight loss in breastfed term infants readmitted for hyperbilirubinemia. BMC Pediatrics. 2009
พรสวรรค์ เจียประเสริฐ. สาเหตุ ปัจจัยเสี่ยงและผลการรักษาของทารกแรกเกิดที่ตัวเหลืองรุนแรงซึ่งได้รับการเปลี่ยนถ่ายเลือด. พุทธชินราชเวชสาร 2552; 26: 229-242.

Introduction

- Weight loss in the infant of greater than 7% from birth weight indicates increase risk of hyperbilirubinemia and can lead to kernicterus.
- Because of the severe complications, the presence of neonatal jaundice frequently results in diagnostic evaluation.
- Hyperbilirubinemia is the most common condition that requires medical attention in newborns.

Introduction

- **Maisels J and Gifford K (1986)** suggested that the newborns who had weight changes correlated inversely with the level of bilirubin in the blood.

Maisels J and Gifford K. Normal serum bilirubin levels in the newborn and the effect of breast - feeding. Pediatrics 1986; 78: 837 – 843
Lawrence M. Gartner. Breastfeeding and Jaundice. Journal of Perinatology 2001; 21: S25 – S29.

The objective of this study

- To describe the association between total serum bilirubin (TSB) levels and weight loss during the first weeks of life.

Method

Method

- **Study design**

  Retrospective cohort study

- **Sample**

  The 112 newborns who were diagnosed breastfeeding jaundice between 2008-2013.

- **They were divided into 2 groups**

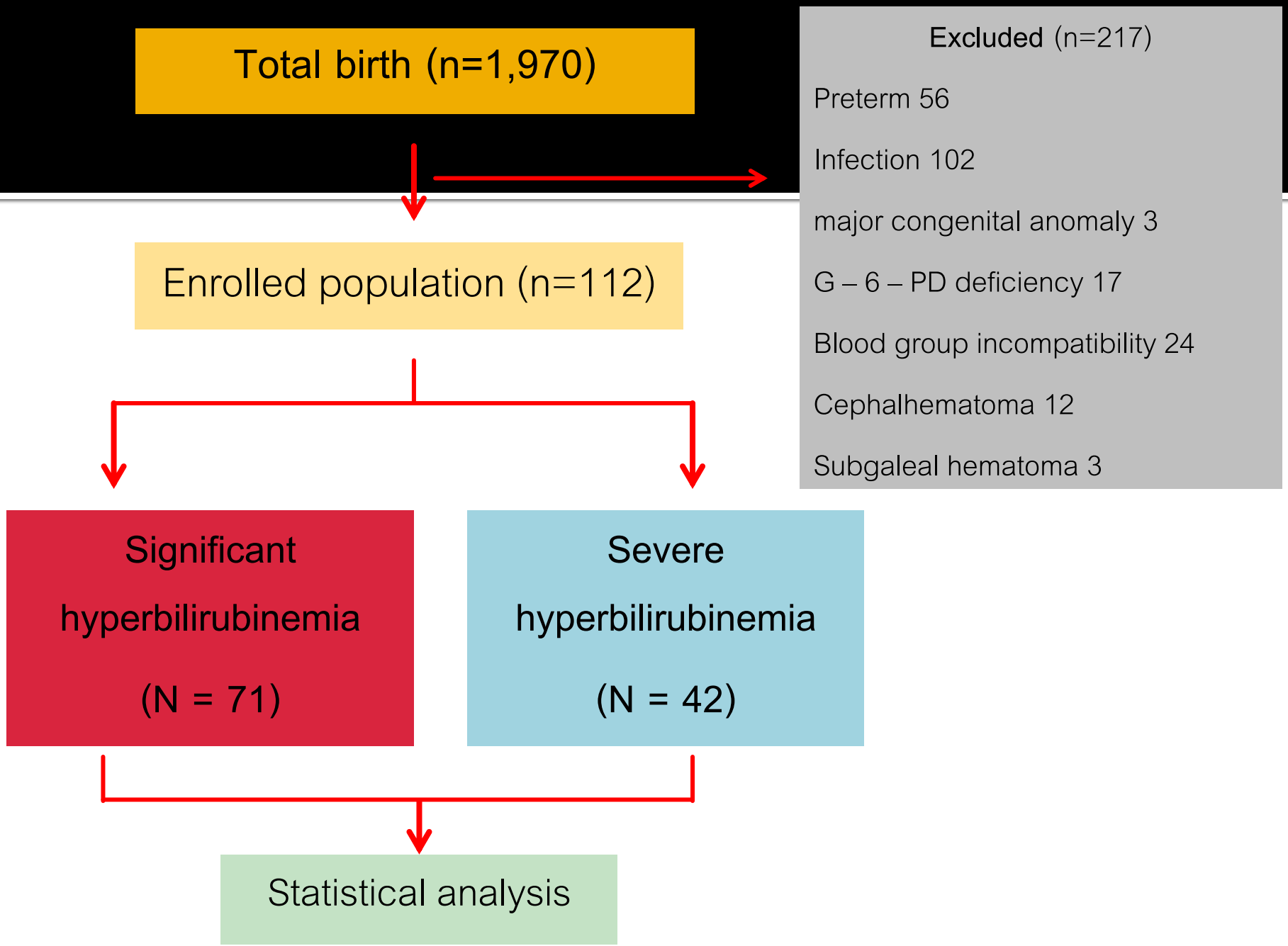
  - significant hyperbilirubinemia ($12 \leq MB < 18$ mg/dL)
  - severe hyperbilirubinemia ($MB \geq 18$ mg/dL)

Method

- **Inclusion criteria**
  - Term newborn GA 37-42 weeks
  - The newborns who were diagnosed breastfeeding jaundice by pediatrician.
  - Total serum bilirubin is greater than 12 mg/dl at 7^{th} day of life

Method

- **Exclusion criteria**
  - Preterm newborn
  - Neonatal sepsis
  - The newborns who were diagnosed
    - Hemolytic disease
    - Major congenital anomaly
    - Respiratory distress
    - Feeding intolerance
    - Extravascular blood Ex. cephalhematoma, caput succedaneum
    - G6PD deficiency


Total birth (n=1,970)
Excluded (n=217)
Preterm 56
Infection 102
major congenital anomaly 3
G – 6 – PD deficiency 17
Blood group incompatibility 24
Cephalhematoma 12
Subgaleal hematoma 3
Enrolled population (n=112)
Significant hyperbilirubinemia (N = 71)
Severe hyperbilirubinemia (N = 42)
Statistical analysis

Method

- **Location of research**
  - Naresuan University Hospital
- **Tools**
  - Microsoft Excel 2010
  - SPSS v.19.0

Statistical analysis

- Using **mean and SD** to compare the significant and severe group
- **P-value** for evaluated the association between weight loss and hyperbilirubinemia.

Result

Result

- The study showed a statistically significant relation between the percentage of body weight change and microbilirubin level in the newborns in this study ($p < 0.003$)
  - The newborns with significant hyperbilirubinemia
  - The newborns with severe hyperbilirubinemia

Result

Perinatal History	Signigicant Hyperbilirubin 12<TSB<18 mg/dL	Severe Hyperbilirubinemia TSB ≥ 18 mg/dL
Gender of Newborn		
Male n(%)	32 (45.71)	22 (52.38)
Female n(%)	38 (54.29)	20 (47.62)
Birth weight (g) mean ± SD	2994.5 ± 373.85	3084.76 ± 456.79
Pre Discharge		
Hct (%) mean ± SD	48.53 ± 5.23	50.24 ± 6.93
MB (mg/dL) mean ± SD	12.19 ± 3.12	10.12 ± 2.85
Body weight at discharge (g) mean± SD	2789.14 ± 307.95	2862.98 ± 422.25
Hx of on Phototherapy n(%)	24 (34.28)	6 (14.29)
Day of Life at D/C (day) mean ± SD	2.71 ± 0.64	2.72 ± 0.66

Result

Revisited	Signigicant Hyperbilirubin 12<TSB<18 mg/dL	Severe Hyperbilirubinemia TSB ≥ 18 mg/dL
Age (Day) Mean ± SD	7.45 ± 1.78	6.81 ± 1.15
Weight (g) Mean± SD	2966.71 ± 390.82	2980.55 ± 442.80
Newborn's weight loss from birth weight (g) Mean± SD	-27.79±172.37	-104.21 ± 134.51
Percent of weight loss from birth weight (g) Mean± SD	-0.81 ±5.54	-3.25 ± 4.51
Hct (%) mean ± SD	48.26 ± 6.29	49.86 ± 6.87
MB (mg/dL) mean ± SD	13.54 ± 2.27	20.37 ± 1.99
Phototherapy n(%)	14 (20.00)	42 (100)
Exclusive Breastfed n(%)	61 (85.92)	38 (90.48)

Discussion & Conclusion

Conclusion

- The relationship between weight change and hyperbillirubinemia in the newborns that weight changes correlated inversely with the level of bilirubin in the blood

  - ***The study revealed if weight decreased by 1 percent, the level of bilirubin would increase by 1.65 mg/dL***

Conclusion

- The results showed that the change in weight of the newborn is associated with level of bilirubin in the blood
- The weight change in newborns can be use to help the doctor to decide to further investigate for the diagnosis of jaundice

Strengths and Weaknesses

- **Strengths**
  - A number of population in this study more than the previous research
- **Weaknesses**
  - This is a retrospective study
  - Short duration for data collections (a week)

THANKS YOU FOR YOUR ATTENTION