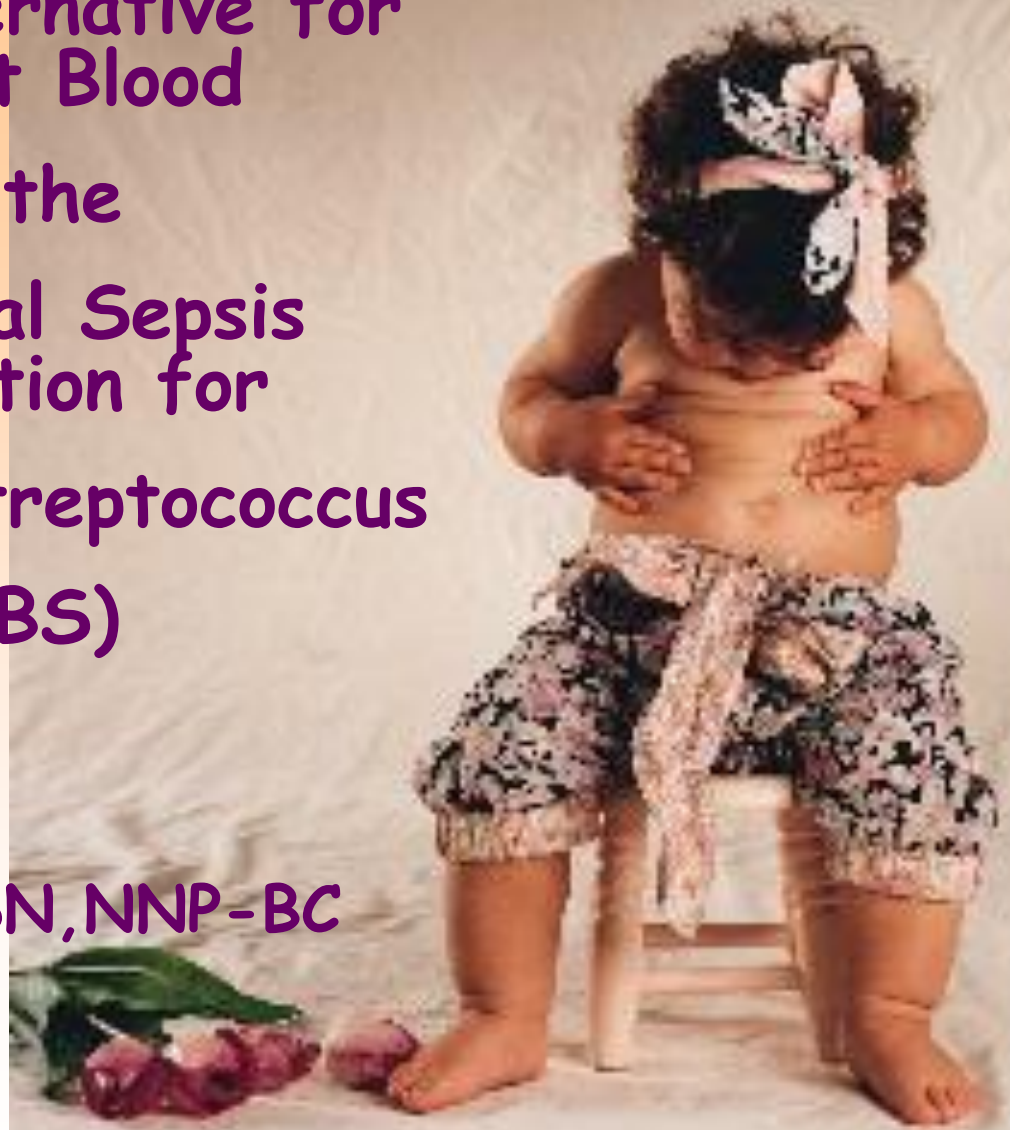


**Umbilical Cord Blood
as an Alternative for
Infant Blood
in the
Neonatal Sepsis
Evaluation for
Group B Streptococcus
(GBS)**

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Objective

- The overall goal of this study is to evaluate reliability of umbilical cord blood sampling for CBC and blood cultures compared to the infant's blood from a peripheral site for the purpose of GBS sepsis screening.



Background and Significance

- Persons of all ages can be colonized with GBS without having any symptoms
- Infants contract GBS infection from the mother during labor (Ohlsson & Shah, 2009).

Background and Significance

- Early onset GBS sepsis is a leading cause of potentially preventable neonatal morbidity and mortality in the U.S.
- Early precise detection is an essential part of decreasing morbidity and mortality in newborns
- Long term sequelae are frequently encountered in survivors of GBS sepsis.

(Polin et al, 1981).



Background and Significance

- Sepsis evaluation has become the most common cause for triage admission to the nursery.
- Between 324,000 and 608,000 newborns require a sepsis evaluation in the U.S. annually.

(Hansen, Forbes & Buck, 2005)

Background and Significance

- The incidence of early onset sepsis, particularly GBS , varies from 1 to 4 cases per 1,000 live births.
- Early onset GBS sepsis occurs in approximately one neonate per 100 to 200 GBS colonized women.



2007 CDC Recommendations for GBS intrapartum chemoprophylaxis

- Culture based approach
- Risk factor based approach
 - Maternal Fever \geq 100.4 ° F.
 - Prolonged rupture of membranes \geq to 18 hours.
 - Premature labor or rupture of membranes at $<$ 37 weeks.
 - History of an infant with GBS sepsis from a previous pregnancy.
 - Presence of positive urine or genital cultures for GBS during the present pregnancy.

(CDC, 2007)

2007 CDC Recommendations for GBS management

- Two doses of penicillin intrapartum is considered adequate prophylaxis.
- Infants born at <35 weeks or > 35 weeks to at risk mothers who received <2 doses are considered "At Risk Infants" for GBS sepsis.
- As per CDC guidelines, CBC and blood culture should be obtained on "At Risk Infants".

(CDC, 2007)

Optimal GBS management

- Earliest possible identification of infants at risk for GBS
- Rapid and accurate detection
- Early initiation of antibiotic therapy
(Awaiting clinical emergence of sepsis before beginning treatment diminishes successful outcome).
(Polin et al, 1981)



How many sepsis evaluations are done?

- During the years 1999- 2007, approximately 250-300 infants a year had sepsis evaluations at Scott and White Hospital.
- These are the infants that can potentially benefit from umbilical cord blood sampling.

Incidence

- Based on surveillance data by the Active Bacterial Core surveillance system, the annual incidence of early onset GBS disease in infants aged 0-6 days was 33% lower as a result of implementation of CDC guidelines
- Continued surveillance needed to guide further interventions

(CDC, 2007)

Methods

- IRB approved prospective study.
- 200 "At Risk Infants" for GBS sepsis will be enrolled in this study.

Methods: Blood sampling

- A CBC and 1 blood culture will be obtained from the umbilical cord of "At Risk Infants" in a sterile manner.
- A CBC and 1 blood culture will be obtained via peripheral blood from the "At Risk Infants" in a sterile manner.



Methods: Data Collection

- Maternal history (risk factors/antibiotics)
- Birth weight, gestational age, gender
- Type of resuscitation required at delivery
- Time & site of neonatal blood sampling
- Time & site of umbilical blood sampling
- Blood volume of each sample
- CBC results
- Blood culture results

Budget

Clinical	Cost per Unit	# of Units	Total Cost
CBC	\$97.00	200	\$19,400.00
Blood culture	\$261.00	200	\$52,200.00
Staff	Cost per Unit	# of Units	Total Cost
Statistician	\$55.00	8	\$440.00
APRN (1)	\$45.00	40	\$1800.00
Total Cost			\$73,840.00

Summary

- Neonatal group B streptococcus can be fatal if undetected and untreated.
- Reduction of painful procedures, inconveniences, and expenses for infants, parents, health care system is essential.
- Helps facilitate drive to improve efficiency and family-centered care.

In Conclusion...

- Providing significant correlation of lab results between umbilical cord blood (UCB) and infant blood (IB) would allow use of UCB as an alternative to infant phlebotomy.,



In Conclusion...

- Substitution of UCB for IB to detect neonatal bacteremia could:
 - avoid pain and trauma to the neonate
 - avoid anxiety for the family
 - save significant time of the skilled professionals
 - obtain larger volumes of blood from cord
 - save the costs of supplies

Cord Blood vs. Infant Blood

Bonding



NICU



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There are two ways to live your life.
One is as though nothing is a miracle.
The other is as though everything is a miracle.

Albert Einstein (1879–1955)

