

Puerperal infection associated with GBS carriage during pregnancy: A logic model approach to prevention

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"...Ignác Semmelweis, a Hungarian obstetrician who practiced in Vienna in the early to mid-1800's, was the first to identify an infectious mode of transmission of puerperal sepsis."*

Background

- 1) Group B streptococcus (GBS) possesses virulence factors which can increase risks of serious infection during pregnancy (vagina, decidua, trophoblast, umbilical cord, amniotic fluid, fetus/perinate organs and tissues) and for immune-impaired individuals of any age or reproductive status.
- 2) GBS pathophysiology follows the outlines of Theobald Smith's equation.
- 3) Logic model analyses are designed to allow for community or patient-based approaches to primary prevention.

Objective

Construct a logic model-informed review/analysis to foster recommendations for reducing risks of GBS infections.

Methods

We constructed a logic model matrix using available indexed (Medline, Google, PubMed) searches

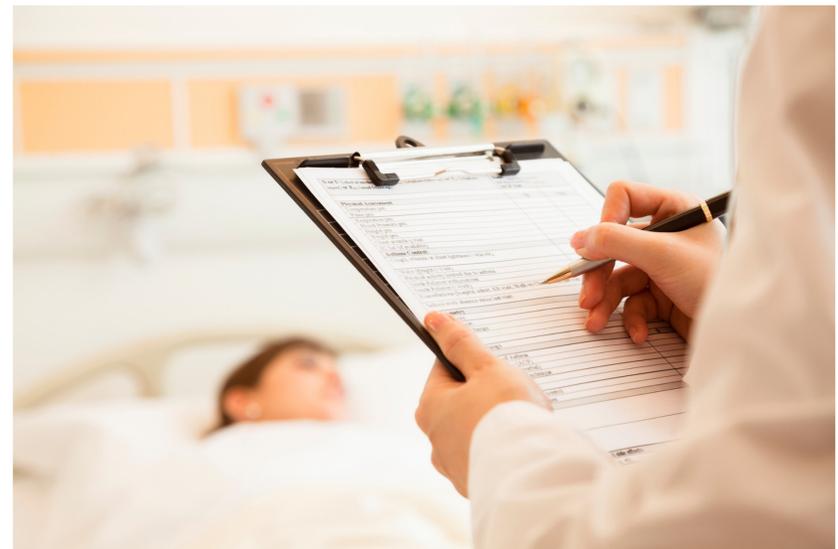
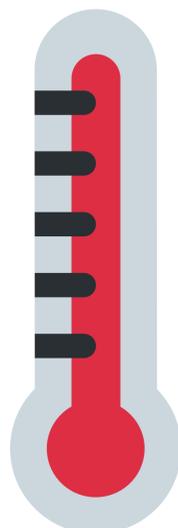
Results

- 1) GBS colonization (GI/GU tract) is associated with estrogenized tissues and systems including genitourinary and reproductive tracts and "products of conception" including decidua, placenta, uterus, and fetal structures; also including bacteremia/sepsis and urinary tract infections as well as post operative/C-section infections.
- 2) Signs and symptoms of GBS puerperal infections (1-2% births) are characterized by rapid-onset of relatively high fever >38 degrees C, tachycardia, malaise, tenderness, normal appearing lochia with mixed uterus and clinical sepsis findings.
- 3) Diagnosis and treatment approaches remain empirical and successful, with rare maternal deaths.
- 4) Results of one study suggested that "around one in every twenty early neonatal deaths could be avoided if puerperal infections were appropriately managed." (Bellizzi). Stillbirths were not mentioned.

"Puerperal sepsis (or "childbed fever") has been associated with maternal morbidity and mortality for centuries."

"Group B *Streptococcus* (*Streptococcus agalactiae*; GBS) was first identified as a cause of puerperal sepsis in 1935..."

*Koenig, J. M., & Keenan, W. J. (2009). Group B Streptococcus and Early-Onset Sepsis in the Era of Maternal Prophylaxis. *Pediatric Clinics of North America*, 56(3), 689.



Conclusion

Opportunities for further reducing risks may include a) further basic and applied research focusing on prevention strategies including active/passive VACCINATION and b) patient-informed checklist approaches including screening and treating GBS bacteriuria and elimination of "membrane stripping."

"Lincoln Thomas Hawke Smith came into this world sleeping at 11:15am September 11, 2016. I got to hold my little one for about 10 minutes while we waited for the placenta to deliver. But once the placenta delivered the sickness transferred to me (at this point we did not know it was Group B Strep that took my Lincoln from me).

My fever spiked to 105.7. I spent the next 5 days in the ICU due to horribly low blood pressure. I did not find out for three days into my hospital stay that it was Group B Strep. I was finally discharged from the hospital September 17, 2016. Leaving that hospital with my arms empty was the hardest thing in my life I have ever had to do."

-Lincoln's mother