

# Neonatal Invasive Infections Focused on Group B Streptococci

## AKADEMISK AVHANDLING

som för avläggande av Medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligen försvaras i Tallen, Drottning Silvias Barnsjukhus, Östra sjukhuset, Sahlgrenska Universitetssjukhuset, den 10 september, kl. 09:00

av Margrét Johansson Guðjónsdóttir

Fakultetsopponent:

Professor Claus Klingenberg

UiT The Arctic University of Norway, Tromsø, Norge

Department of Clinical Medicine

## Avhandlingen baseras på följande delarbeten

- I. **Johansson Gudjonsdottir M**, Hentz E, Berg S, Backhaus E, Elfvin A, Kawash S, Trollfors B. Serotypes of group B streptococci in western Sweden and comparison with serotypes in two previous studies starting from 1988. *BMC Infect Dis* **15**, 507 (2015).
- II. **Johansson Gudjonsdottir M**, Elfvin A, Hentz E, Adlerberth I, Tessin I, Trollfors B. Changes in incidence and etiology of early-onset neonatal infections 1997–2017 – a retrospective cohort study in western Sweden. *BMC Pediatr* **19**, 490 (2019).
- III. **Johansson Gudjonsdottir M**, Elfvin A, Hentz E, Adlerberth I, Tessin I, Trollfors B. Late-onset Neonatal Infections 1997 to 2017 Within a Cohort in Western Sweden—The Last 21 Years of a 43-Year Surveillance, *The Pediatric Infectious Disease Journal*: April 2021 - Volume 40 - Issue 4 - p 359-364.
- IV. Huebner E\*, **Johansson Gudjonsdottir M\***, Dacanay M\*, Nguyen S, Brokaw A, Sharma K, Hentz E, Elfvin A, Rivera Y, Burd N, Coler B, Li M, Li A, Munson J, Orvis A, Coleman M, Jacobsson B\*, Rajagopal L\*, Adams Waldorf K\*. *\*Equal contributions*. Virulence Factors of Invasive Group B Streptococcus Isolates Obtained from Swedish Pregnant Women and Neonates. *In manuscript*.

**SAHLGRENKA AKADEMIN**  
**INSTITUTIONEN FÖR KLINISKA VETENSKAPER**



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**Margrét Johansson Guðjónsdóttir**

Avdelning för Pediatrik, Institutionen för kliniska vetenskaper, Sahlgrenska akademien, Göteborgs universitet, Sverige.

## Abstract

Invasive infections affect neonates with the risk of severe morbidity and death, and *Streptococcus agalactiae* (Group B streptococcus, GBS) remains one of the most common pathogens. The aim of this thesis was to assess infections among neonates and infants, focusing on GBS to better understand prevention and treatment. Clinical data and outcomes were collected from patients' medical records.

Paper I was a prospective cohort study of GBS isolates obtained from adults and children with an invasive GBS infection in the years between 2004 and 2009. The study showed that among infants, serotype III was the most prevalent (48%), but serotype V (39%) was most common among adults. Paper II and III were epidemiological, retrospective studies on early-onset (EO) and late-onset (LO) invasive infections among infants living within Gothenburg or five surrounding municipalities, from whom a pathogenic organism was isolated from blood or cerebrospinal fluid during the years 1997–2017. The studies showed that EO infections decreased from 1.4 to 0.9 per 1000 live births from 1997–2007 to 2008–2017. During the same period, the incidence of LO infections increased from 2.0 to 3.1 per 1000 live births. The case fatality rate remained unchanged for both studies. Paper IV was a cohort study of GBS isolates obtained from pregnant or postpartum women and infants with an invasive GBS infection in Western Sweden during 1988–2001 and 2004–2009. The study showed that invasive isolates exhibited more pigmentation compared to commensal isolates.

**Conclusions:** These studies have shown that the incidence of EO infections has declined, but for LO infections, it has increased. The serotype distribution of invasive GBS strains has remained the same. The invasive strains exhibit more pigmentation, which provides the basis for additional studies to determine if routine laboratory testing can be safely used to identify the GBS strains that put the unborn child at risk.

**Keywords:** Neonatal sepsis, Group B streptococci, Virulence factors.