

Development of Vaccine Against Group B Streptococcus- Current Status and Future Perspectives

Sneha Kunwar, Mailman School of Public Health | Class of 2022

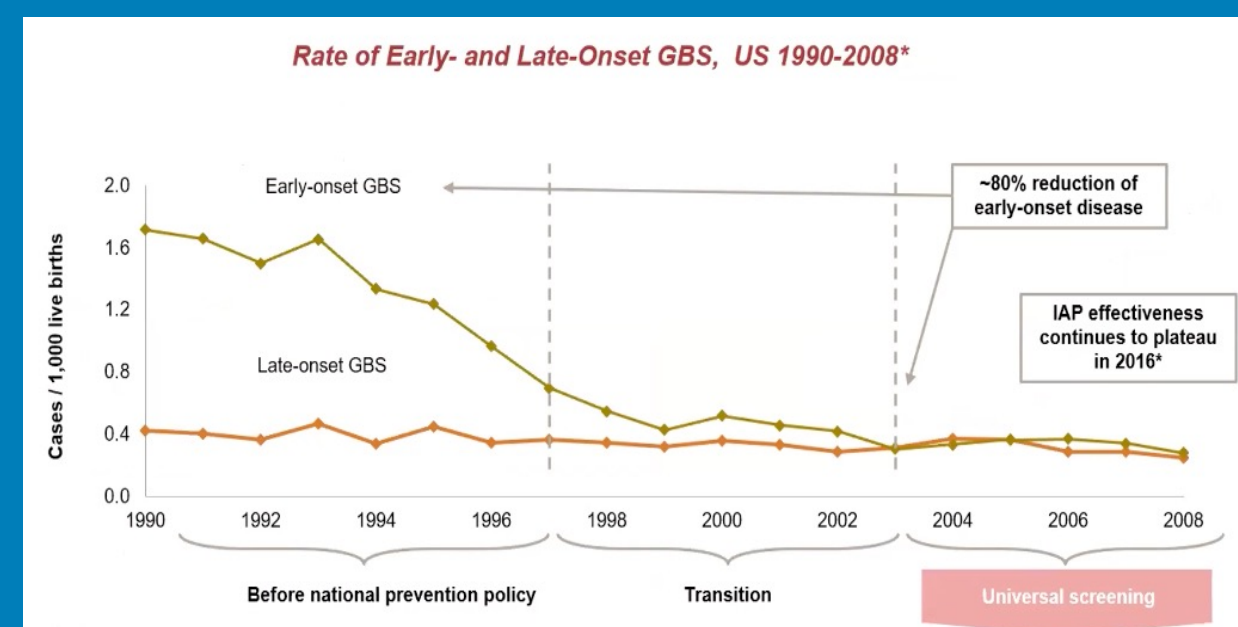
Mentors: Yekaterina Timofeyeva, MS; Dr. Isis Kanevsky, PhD; Dr. Lawrence Stanberry, MD, PhD

Pfizer, Vaccine Research and Development

Summary of the current state of Group B Streptococcus vaccine development.

BACKGROUND

Streptococcus agalactiae (GBS) sometimes cause some illness during pregnancy. Many developed countries provide intrapartum antibiotic prophylaxis (IAP) as the prevention strategy¹. Although IAP has reduced the incidence of early onset GBS disease, the late-onset diseases have remained unaffected.



PFIZER'S WORK ON GBS6 VACCINE

Pfizer is developing a 6-valent GBS vaccine (GBS6) to reduce infections in neonates and young infants through maternal immunization. Pfizer's approach for the vaccine design is based on the epidemiology and knowledge that Capsular Polysaccharides (CPS) is considered best target for the development of GBS vaccine.¹

Maternal immunoglobulin G (IgG) is transported across the placenta and provides passive protection to the infant in the postnatal period.² IgG glycosylation is a major factor in the efficiency of transplacental transfer.

Pfizer is conducting a study to determine antigen specific IgG glycan profile in pregnant nonhuman primates (NHP) that results in maximum transfer of functional anti-GBS antibody in neonate.

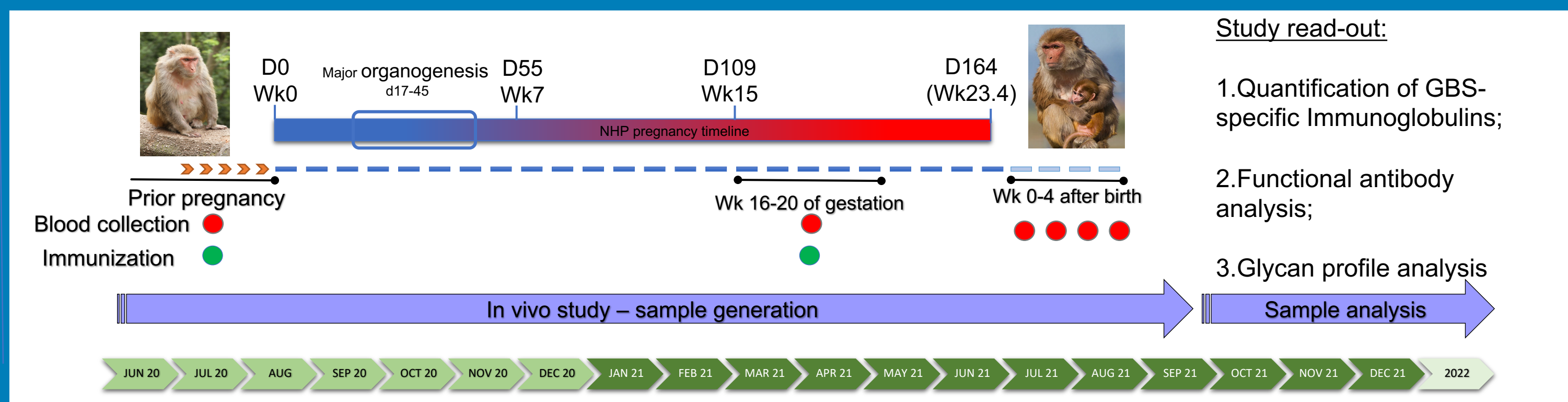
METHODS

A literature review was conducted to summarize the epidemiology of GBS disease, and current status of vaccine development against GBS. Data sources included peer-reviewed literature, governmental health reports, and governmental data from national statistics offices.

Read-out methods of the NHP study were evaluated by analyzing the data obtained in preclinical studies and clinical trials conducted by Pfizer. Read-out methods were evaluated for scientific and clinical relevance and resource availability.

RESULTS

During my time at Pfizer, I supported the team in setting the project timeline and established resourcing and task delegation. Currently, samples are in the process of collection and will be read-out and analyzed by the assigned teams.



Study read-out:

1. Quantification of GBS-specific Immunoglobulins;
2. Functional antibody analysis;
3. Glycan profile analysis

DISCUSSION

While many challenges remain to be addressed, the achievements in maternal immunization research to date have advanced the field and Pfizer's GBS6 vaccine showed promising results in the phase 1/2 trial.

The ongoing NHP study will serve as a critical steppingstone for the vaccine development process and ultimately address the severe unmet medical need for the prevention of early and late-onset GBS disease in infants globally.

REFERENCES

1. Buurman, E. T., Timofeyeva, Y., et al. (2019). *The Journal of infectious diseases*, 220(1), 105–115. <https://doi.org/10.1093/infdis/jiz062>
2. Nuccitelli, A., Rinaudo, C. D., & Maione, D. (2015). Group B Streptococcus vaccine: state of the art. *Therapeutic advances in vaccines*, 3(3), 76–90. <https://doi.org/10.1177/2051013615579869>

Group	Number of animals	Vaccine	Adjuvant
1	11	CPS-CRM GBS III + CP-CRM GBS IV	None
2	11	CPS-CRM GBS III + CP-CRM GBS IV	AlPO ₄
3	6	Flucelvax Quadrivalent	NA