Whole-genome sequencing analysis of Streptococcus agalactiae from clinical isolates



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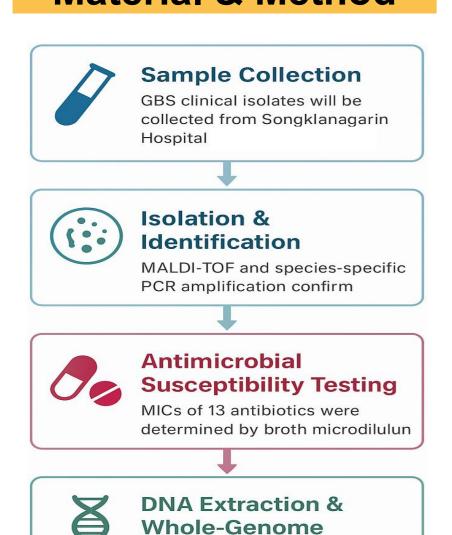
Abstract

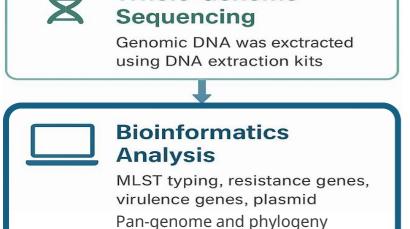
Streptococcus agalactiae (GBS) causes neonatal sepsis, meningitis, and adult invasive disease. We analyzed the entire genomes of 25 GBS clinical isolates from Songklanagarind Hospital, Thailand. All isolates were susceptible to penicillin, ampicillin, ceftriaxone, vancomycin, linezolid, and co-tromoxazole, but some of them were resistant to tetracycline (63.6%) and tigecycline (45.5%). Out of 25 isolates, 5 were multidrug-resistant. Genomic analysis revealed key virulence genes (*cyl* operon, *cfb*, *neuA/B/C*, *hylB*). Findings highlight the genetic and phenotypic diversity of invasive GBS in Southern Thailand and stress the need for ongoing genomic surveillance.

Objective

To phenotypically and genotypically characterize the *S. agalactiae* from clinical isolates

Material & Method





Results & Discussion 100% 90% 80% 70% 60% 50% 100 100 100 100 100 100 96 20% PEN AMP CRO VAN LZD ERY AZM CLI LVX TET TGC SXT CHL Antibiotics

Figure 1 MIC results present susceptibility of GBS isolates.

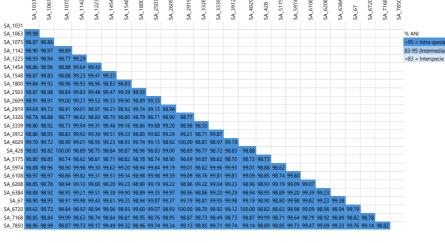


Figure 4: ANI analysis of 22 GBS isolates

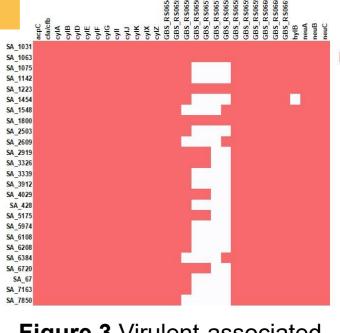


Figure 3 Virulent-associated genes in 22 GBS isolates.

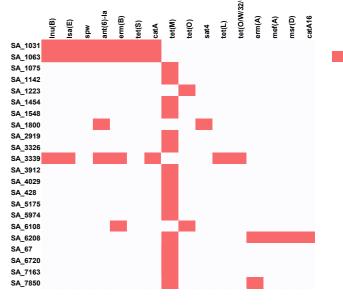


Figure 2 Antibiotic-resistant genes in 22 GBS isolates

Summary

- **AST**: All isolates susceptible to PEN, AMP, CRO, VAN, LZD, SXT; resistance mainly to TET (52%) & TGC (40%). MDR in ~20%.
- ARGs: tet(M) most common; one isolate carried multiple ARGs.
- **Virulence**: All carried *cyl* operon + *acpC*, *cfa/cfb*, CPS cluster; *hylB* absent in one isolate.
- **Genomics**: High ANI similarity. MLST: ST1 most frequent; diverse STs incl. novel ST (SA_1548). ST283 absent.

Reference

- 1. Tsai, Ming-Horng, et al. "Molecular characteristics and antimicrobial resistance of group B Streptococcus strains causing invasive disease in neonates and adults." *Frontiers in microbiology* 10 (2019): 264.
- 2. Vornhagen, Jay, Kristina M. Adams Waldorf, and Lakshmi Rajagopal. "Perinatal group B streptococcal infections: virulence factors, immunity, and prevention strategies." *Trends in microbiology* 25.11 (2017): 919-931.

Conclusion

- GBS isolates were fully susceptible to first-line β -lactams, but resistant to tetracycline/tigecycline.
- 20% were multidrug-resistant.
- Virulence genes were widespread; one novel ST identified, ST283 absent.
- Highlights need for continuous AMR and genomic surveillance.