ADVERSE PREGNANCY AND NEONATAL OUTCOMES ASSOCIATED WITH NEISSERIA GONORRHOEAE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background Neisseria gonorrhoeae (NG) infections during pregnancy have been reported to be associated with a range of adverse pregnancy outcomes, but systematic information is lacking. The objective of this study was to systematically review data about associations between NG and: preterm birth (PTB); low birth weight (LBW); premature rupture of membranes; spontaneous abortion; perinatal mortality; and ophthalmia neonatorum.

Methods We searched Medline, Excerpta Medica, Cochrane Library and the Cumulative Index to Nursing and Allied Health Literature databases up to October 2017. Two researchers selected studies, extracted data and assessed risk of bias independently. We used meta-analysis to calculate summary odds ratios (OR with 95% confidence intervals, CI) separately for unadjusted and adjusted results, stratified by study design. We assessed heterogeneity using the I² statistic.

Results We screened 2,290 articles and included 15 studies, published from 1976–2017, of which seven were from low or lower-middle income countries. For PTB, the summary unadjusted OR was 1.47 (95% CI 1.17–1.89, I²=86%) in four case-control studies, 1.93 (1.24–2.63, I²=86%) in two cross-sectional studies and 0.78 (0.49–1.06, I²=0%) in three cohort studies. Adjusted ORs were only available in three case-control studies, summary OR 1.14 (0.85–1.44, I²=16%). For LBW, the summary unadjusted OR was 1.57 (1.15–1.99, I²=53%) in three case-control studies, 1.20 (0.30–4.30) in one cross-sectional study and 0.99 (0.73–1.25, I²=47%) in two cohort studies. The adjusted summary OR was 1.33 (0.96–1.71, I²=0%) in the case-control studies. For other outcomes, unadjusted summary ORs varied, generally being lower for cohort than cross-sectional or case-control studies.

Conclusion In this systematic review of observational studies, the strength of associations between NG and adverse pregnancy outcomes were weaker than expected and, where data were available, attenuated after adjusting for confounding. Ongoing randomised controlled trials will now determine whether screening and treatment of NG in pregnancy reduces adverse outcomes.

Disclosure No significant relationships.

Analyzing the genomes of Neisseria gonorrhoeae isolates using a novel integrated bioinformatic pipeline: Gen2Epi

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Background Whole genome sequencing (WGS) is a high-resolution approach for tracking the transmission and antimicrobial susceptibility (AMS) of Neisseria gonorrhoeae (Ng). Multiple bioinformatics tools currently used for the analysis of WGS data for Ng complicate their application in clinical settings. We determined the genomic epidemiology and AMS of Ng from Saskatchewan (SK) using our integrated pipeline, Gen2Epi, previously validated on 1484 publicly available Ng genome datasets.

Methods WGS was performed on 99 Ng isolates (2017–2018) from SK submitted to the Roy Romanow Provincial Laboratory. Genomic DNA was isolated using the DNeasy mini kit (QIAGEN) and sequenced using MiSeq (Illumina). MICs were determined by agar dilution. Gen2Epi includes read assembly, scaffolding, strain typing (ST) by MLST and NG-MST, plasmid identification, and identification of mutations in antibiotic resistance genes by NG-STAR.

Results Nine MLST/NG-MST/NG-STAR (M/M/S) STs comprised 75.6% (75/99) of the isolates; other M/M/S STs (24.3%, 24/99) comprised single isolates. M/M/S ST 1901/1045/90 predominated (21.3%, 21/99), carrying mosaic penA type 34.001 and mutations in mtrR/porB/ponA/gyrA/prA. These isolates were chromosomally resistant to penicillin (38%, 8/21), tetracycline (95.2%, 20/21), and ciprofloxacin (90%, 19/21); they were susceptible to ceftriaxone and 38% (8/21) had cefixime MICs of 0.125 mg/L. The second-most prevalent ST was 1584/7638/160 (18/99); most of these isolates (16/18) were susceptible to all antibiotics. Overall, 57.6% (57/99) of the isolates were tetracycline resistant; 29.8% (17/57) of these were from Regina and carried a tetM gene (M/S ST 12462/5985/42). One sporadic isolate was azithromycin resistant (23S rRNA-A2059G), carried tetM and was M/S ST 7822/304/515.

Conclusion Gen2Epi is a one-stop pipeline that both assembles and annotates raw reads and simplifies the analysis of transmission markers and AMS in Ng. We showed the emergence of M/M/S ST 1901/1045/90 as the predominant ST in SK. NG-MST ST 10451 is similar (22bp) to ST 1407 which is implicated in reduced susceptibility to cefixime.

Disclosure No significant relationships.