A Canadian provincial approach to performance evaluation and quality assurance of prenatal screening through the better outcomes registry & network

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Objective

Prenatal screening for the common aneuploidies and Open Neural Tube Defect (ONTD) has been publically funded in Ontario since 1993. Although prenatal screening test results and follow up information were centrally collected, there were incomplete data on pregnancy outcomes. It was impossible to systematically review screen performance and evaluate the screening system until the advent of the Better Outcomes Registry & Network (BORN). This work in progress will describe a comprehensive prenatal screening quality assurance system.

Methods

The Better Outcomes Registry & Network (BORN Ontario) is the authoritative source for maternal and child information in Ontario. Through an encounters model, BORN captures information across the continuum of care; from the initial prenatal screening test result, through labour and birth, and other encounters in maternal and newborn care. This comprehensive data collection allows BORN to identify trends and gaps in provision of care, as well as inform appropriate updates to screening algorithms and processes, Prenatal screening test results are uploaded weekly from all 5 prenatal screening centres in the province. This information is linked with data collected from other encounters, including utilization of follow-up services, results of other screening tests and diagnostic procedures and pregnancy outcomes. Multiple reports have been developed to enable the evaluation of quality, efficiency and the performance of prenatal screening in Ontario.

Results

Over 230, 000 prenatal screening records have been collected in the BORN Information system (BIS) since its launch in 2012. These data together with information collected from other program areas have enabled us to report on the utilization of prenatal screening, the performance of various screening tests for common aneuploidies and ONTD and the effectiveness of screening tests and follow-up services in Ontario. In collaboration with the Down syndrome screening Quality Assurance Support Service (DQASS) in the UK, BORN has created a pilot program of quality assurance that reports on nuchal translucency (NT) measurements from each sonographer, comparing paired NT and CRL measurements with the curve published by the Fetal Medicine Foundation, UK, and reporting on the three quality indicators (bias, trend, spread) reported by DQASS. A recent province-wide audit revealed that 74% of 740 assessed sonographers were under-estimating NT thickness by a clinically significant margin as compared to accepted FMF criteria, and 34% cannot be assessed as they submit an insufficient number of measurements for accurate review. Ontario sonographers that are registered with BORN can now access their specific report through the BIS. A laboratory QA report built in BORN has been used as a tool for external quality assurance of prenatal screening tests in Ontario.

Conclusion

A robust birth outcomes database linked to preceding prenatal health system encounters is the only accurate way to truly inform QA initiatives (real life data vs modeling) and performance assessment of prenatal screening. By integrating information at various health system encounter points, the BIS will also allow assessment of the impact of additional markers on screening for the common aneuploidies, as well as the use of various markers to screen for placental insufficiency syndromes and other adverse obstetric outcomes.