

Concept of cycle threshold values in SARS-CoV-2 positive patients at childbirth admission: a retrospective observational study

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Abstract

Objective To evaluate relationships between cycle threshold values and COVID-19 presentations and clinical courses in women presenting for childbirth. Cycle threshold values from polymerase chain reaction (PCR) testing are inversely proportional to viral burden and may be important predictors of disease state and infectivity risk. **Design** Retrospective cohort study **Setting** Three Yale-New Haven Health Hospitals between 4/2/2020-5/14/2020 **Population** Women presenting for childbirth who underwent SARS-CoV-2 PCR testing **Methods** Electronic health records were reviewed for socio-demographics, medical comorbidities, pregnancy and postpartum course, and COVID-19 symptoms and exposures. Records of SARS-CoV-2 positive women were reviewed for symptom onset, duration, and relation to test timing, disease course, and neonatal SARS-CoV-2 results. **Main Outcome Measures** SARS-CoV-2 real-time PCR cycle threshold values from positive tests were compared between asymptomatic and symptomatic women and in relation to disease severity. In women with symptomatic COVID-19, cycle threshold values were evaluated as a function of time since symptom onset. **Results** 1,210 women gave birth during the study period with 84 (6.9%) positive for SARS-CoV-2. Higher cycle threshold values were seen in asymptomatic SARS-CoV-2 positive patients (8/38 (21.1%) of asymptomatic women had cycle threshold <30 compared to 22/32 (68.0%) of symptomatic women, $p < 0.0001$). In symptomatic women, values increased as time from symptom onset increased. **Conclusion** This study demonstrates higher cycle threshold values in asymptomatic patients and symptomatic patients tested remote from symptom onset, signifying older infections and detection of lower levels of viral RNA. Assessment of standardized cycle threshold values may help to understand disease characteristics and progression.

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