2803. Is Maternal Plasma Zika Virus Load Associated with Birth Outcomes and Maternal Disease Severity?

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Background: Adverse fetal outcomes and infant birth defects may develop following Zika virus (ZIKV) infection during pregnancy, especially if this occurs in the first trimester. The aim of this study was to assess the relationship between plasma ZIKV load at the time of acute symptoms and (1) the rate and severity of birth defects in neonates born to mothers who had presented with ZIKV infection during pregnancy, and (2) clinical severity of maternal ZIKV infection.

Methods: Within a cohort of pregnant women living in the French territories in the Americas and exposed to ZIKV during the 2016 outbreak, we analyzed the data of women who developed a symptomatic infection confirmed by a positive plasma ZIKV RT–PCR, using the RealStar Zika virus RT–PCR Kit (Altona Diagnostics, Hamburg, Germany). Plasma ZIKV load quantification was based on the number of cycle times (CT) at which ZIKV RNA was detected (lower CTs indicating a higher viral load). Variables indicating clinical severity of infection included the number of symptoms experienced and the severity of rash. Birth defects possibly linked to ZIKV infection were defined as microcephaly, brain imaging abnormalities, and central nervous system dysfunction. Multivariable logistic regression was used to examine whether potentially ZIKV-related abnormalities were linked to changes in CT, and multivariable linear regression was used to identify clinical correlates with CT value.

Results: Of the 277 live-born neonates who were born to mothers who met the selection criteria, 15 (5.4%) had abnormalities possibly linked to ZIKV infection. The median (IQR) ZIKV RT–PCR CT values were similar, with 31.4 (29.3–33.2) and 31.8 (30.0–33.0), in women delivering normal neonates and those delivering neonates with defects, respectively (OR: 1.04, $P = 0.685$). Plasma ZIKV load was lower with every day since first symptom onset, and higher with each additional symptom experienced, as indicated by changes in CT of 0.3 (95% CI: 0.2 - 0.5, $P < .001$) and −0.3 (95% CI: −0.5 - −0.1, $P = 0.002$) for each unit, respectively.

Conclusion: No relationship was observed between plasma ZIKV load and abnormal pregnancy outcomes but higher plasma ZIKV load was associated with a more recent and severe maternal ZIKV infection.

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2804. Systematic Review of the Role of Prenatal Ultrasound and Amniocentesis in the Diagnosis and Evaluation of Congenital Zika Syndrome

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Background: To inform recommendations for optimal screening for fetal outcomes of Zika virus infection during pregnancy, we examined the relationship between prenatal diagnostics (ultrasound examination and amniotic fluid Zika virus testing) and postnatal congenital Zika syndrome (CZS) abnormalities.

Methods: Systematic searches were performed in 27 medical and public health databases from inception to March 21, 2018 for articles with the keywords "Zika," "prenatal," "ultrasound," and "amniocentesis." A total of 2,281 unique records were identified. Two reviewers independently assessed titles, abstracts, and full texts for content and relevance. Together, the 61 included articles describe 307 mother–fetus/infant dyads; 291 were included in the systematic review of prenatal ultrasound and Zika virus, and 38 were included in the systematic review of amniocentesis and Zika virus.

Results: There were 155 fetuses with CZS findings on prenatal ultrasound examination (53.3%); among them, postnatal CZS abnormalities were reported for 114 (73.5%). High proportions of microcephaly (72.4%), cerebral atrophy (85.7%), and ventriculomegaly (80.6%) were confirmed at pregnancy completion. In addition, 20.6% of the 136 fetuses without any CZS findings on prenatal ultrasound had CZS abnormalities identified at pregnancy completion. Structural CZS abnormalities were identified in approximately equal proportions after pregnancy completion in dyads with and without Zika virus RNA detected in one or more amniotic fluid specimen (53.8% and 58.3%). In 6 pregnancies, Zika virus RNA was detected in amniotic fluid, but no Zika virus RNA was detected in a subsequent amniocentesis specimen.

Conclusion: Prenatal ultrasound can detect structural findings associated with Zika; prenatal detection may vary with factors such as timing of infection, timing of ultrasound, technical expertise, and severity of abnormalities. Detection of Zika virus RNA in amniotic fluid did not predict the risk for CZS abnormalities in this review, and clearance of Zika virus RNA from amniotic fluid appears possible after maternal infection. The decision to perform diagnostic testing for Zika remains a shared decision between patients and clinicians, and more data are needed to define clinical predictors that will inform these decisions.

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2805. Kinetics of Anti-Zika Virus (ZIKV) Antibodies after Acute Infection in Pregnant Women

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Background: The kinetics and specificity of anti-ZIKV antibodies after acute ZIKV infection is not well known, especially in areas where different flaviviruses circulate. The objective of this study was to describe the kinetics of anti-ZIKV antibodies in pregnant women in whom an acute ZIKV infection was identified during pregnancy.

Methods: Within a cohort of pregnant women living in Guadeloupe and exposed to ZIKV during the 2016 zika outbreak, we identified 65 women who presented with an acute, symptomatic PCR-confirmed ZIKV infection at various times of their pregnancy, with a known date of first Zika symptom. Anti-ZIKV neutralizing antibodies (using a Virus Neutralisation Test (VNT)) and anti-ZIKV NS1 antibodies (using IgM and IgG ELISA Euroimmun® kits) were searched for on frozen serum samples obtained from blood drawn at the time of delivery in all women and at various times between acute infection and delivery in 23 women.

Results: Patients' mean age was 30 years and ZIKV infection had occurred during the first, second, and third trimester of pregnancy in 14 (21%), 35 (54%), and 16 (25%) women, respectively. ZIKV serology on delivery samples was positive in 65/65 (100%; one-sided 97.5% CI: 94.4%–100%) women by both VNT and IgG ELISA assays and in 5/65 (8%) women by IgM ELISA assay. In these 5 cases, median time between first symptom and sampling date was 36 days. Results of ELISA assays on the intermediate samples were as follows: IgG antibodies were negative in all 5 samples that had been drawn within 7 days of first symptom and positive in the 18 samples that had been drawn afterwards; IgM antibodies were positive in 10 of the 19 samples that had been drawn within 3 months of first symptom and negative in 2 of the 4 samples that had been drawn afterwards.

Conclusion: After acute ZIKV infection, IgG antibodies developed and remained detectable until delivery by a commercially available ELISA assay in all women tested. These antibodies were specific of ZIKV, with concomitantly positive VNT results. From these findings, the absence of ZIKV antibodies at delivery would strongly indicate the absence of infection during pregnancy.

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2806. Follow-up of Children with Confirmed Perinatal Zika Virus Exposure: The First 2-year experience in the Costa Rican Tertiary Pediatric Hospital

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Background: Costa Rica (CR) has local transmission of Zika Virus (ZIKV) Infection since February 2016. Perinatal exposure (PE) and infection (PI) cases have been documented. Following a national protocol, reporting and follow-up of patients is mandatory. 2018 data of CR reported 272 women with confirmed ZIKV infection during pregnancy. Even though neurological sequelae are described in PI, including microcephaly, affected patients can develop symptoms within months after birth with development, language, and behavior alterations.

Methods: Retrospective descriptive study of patients born from August 1, 2016 until July 31, 2018, with laboratory confirmed PE. Follow-up was performed at referral hospital.

Results: 101 patients were enrolled (37% of all national confirmed perinatal ZIKV exposure during study period). Median age of first evaluation was 5 months (range: 0.6–21). 86/101 (86%) were classified as adequate term infants. 34/101 (33.7%) mothers got infected at first trimester, 55 (54.4%) at second, and 11 (10.8%) at third trimester. No data available in one. 8/101 (8%) patients had microcephaly at birth, with only 3/101 (3%) with persistence at follow-up, and 3/101 (3%) developed it later (after 9 months). 3/101 (3%) had confirmed congenital ZIKV syndrome (laboratory confirmation in symptomatic children), and 2 (2%) congenital ZIKV infection (laboratory confirmation in asymptomatic child). 6/101 (6%) had tone abnormalities and global development delay. 9 (9%) had central nervous system (CNS) ultrasound abnormalities, and 3 (3%) developed seizures. 2 (2%) had visual abnormalities, 1 (1%) had hearing impairment, 4 (4%) developed eating abnormalities, 6 (6%) developed language delay, and 4 (4%) had hyperactive behavior. All findings were divided according to maternal trimester of infection.

Conclusion: PI is a health problem in CR. Microcephaly at is infrequent, with international data showing it affects less than 1% of newborns. Most motor and development delay were documented in patients infected early during pregnancy, but specific language and behavior abnormalities also affected patients with later PE. Mortality was not documented, but significant CNS abnormalities were evident in congenital ZIKV syndrome patients.

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