2016 Queenan Fellowships for Global Health Investigator-Initiated Research Project Award

“Vertical Transmission of Zika Virus: Placental Histopathology and Fetal Outcomes”

I am pleased to report on our studies on the placental pathology of Zika virus infection.

In December 2016, shortly prior to the start of my Queenan Fellowship funding period, Dr. Karin Nielsen (UCLA) and I traveled to Rio de Janeiro, Brazil to meet with Dr. Patricia Brasil and her research team at Fiocruz Institute. This trip not only solidified our research relationship, but also developed new relationships with the larger Rio de Janeiro research group. Prior to this trip, we had only met with Dr. Brasil, who had traveled to Los Angeles in February 2016, in the middle of the 2015-16 Zika outbreak in Rio de Janeiro.

The primary goal of the December 2016 meeting was relationship building and study planning, as our final report on the outcomes of the first 125 women had just been published in the New England Journal of Medicine (Brasil et al., 2016). During the course of the year, most of our cohort study of 187 pregnant women with confirmed Zika infection had delivered at Instituto Fernandes Figueira. This maternity and pediatric hospital has become the primary referral center for perinatal Zika infection in the Rio de Janeiro state. We also met other team members that cared for these patients and their infants on the front lines, including Dr. José Paulo Pereira, Jr. (perinatologist), Dr. Elisabeth Moreira (neonatologist), Dr. Andrea Zin (pediatric ophthalmologist), Dr. Beth Portari (pathologist), and Dr. Zilton Vasconcelos (research laboratory director).

Since our initial meetings, our research has developed into a truly international, two-way collaboration. Dr. Portari (the lead research pathologist responsible for processing and evaluating all the placentas from Zika-infected pregnancies, as well as the fetal/neonatal autopsies) subsequently came to visit my laboratory at UCSF in January 2017. She brought with her 140 placental biopsies, which have undergone preliminary histopathologic analysis.
We have performed systematic histopathologic analysis on these Zika-infected placentas and selected a subset of placentas with diverse clinical outcomes to undergo a more in-depth analysis. In 40 samples, we have performed in situ hybridization experiments to determine the placental cell populations that are infected with Zika virus. We have found that Zika virus is capable of infecting nearly all cell types of the maternal-fetal interface. These results are currently being prepared for publication.

The following works would not have been possible without the Queenan Fellowship and the Foundation for SMFM’ support of our international collaboration. In addition, our group is planning to submit multiple R01 applications to continue this work in the next year.

Abstracts:

2. M Esquivel, E Avaad-Portari, ZC Vasconcelos, ME Moreira, and SL Gaw. “Vertical transmission and placental pathology of twin pregnancies from Zika virus infected mothers.” (Poster at SMFM 38th Annual Meeting, Dallas, TX; February 2018)


Publications:


