

ABSTRACT TITLE

TITLE: Torque Teno Virus Associated with Endophthalmitis

ABSTRACT FINAL ID: 1106 - C0083

SESSION TITLE: Endophthalmitis Poster

SESSION DAY & DATE: Sunday, May 5, 2013

SESSION START TIME: 1:00 PM

SESSION END TIME: 2:45 PM

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Study Group:

ABSTRACT BODY:

Purpose: To investigate the presence of viral pathogens in culture-positive and –negative infectious endophthalmitis using deep DNA sequencing techniques.

Methods: In a prospective fashion, 7 fluid samples from uninflamed eyes and 21 consecutive samples from infectious endophthalmitis diagnosed by a retinal specialist were collected by vitreous or aqueous tap. Using Biome Representational in Silico Karyotyping (BRiSK), a type IIB DNA restriction enzyme (BsaX1) was used to create a representational set of 27-mer DNA tags for each sample and sequenced using a massively parallel sequencing platform. Tags that uniquely matched viral DNA were included for further analysis. Quantitative PCR was performed to verify the presence of pathogens.

Results: Fifteen of the 21 endophthalmitis samples (71.4%) were positive for the Torque Teno Virus (TTV) including 7 out of 7 (100%) of culture-negative samples. In contrast, 0 out of 7 (0%) of the normal vitreous samples were positive for TTV ($p = 0.001$ by Fisher Exact). No other viruses were recovered in these samples, and the presence and absence of TTV were verified by PCR. A mean of 369.4 TTV tags were recovered per sample (range of 1 to 3,580 tags). Quantitative PCR showed relative multiplicity of infection compared to human genomic DNA of up to 258, suggesting a productive infection.

Conclusions: BRiSK is an effective method for identifying viral presence in culture-positive and culture-negative endophthalmitis. TTV is a small non-enveloped single stranded DNA virus with a genome size of approximately 3.8 kb found frequently in the serum of normal individuals (90%) with no clear pathogenic role. TTV has been shown to modulate the immune system by increasing proinflammatory cytokine production of interferon γ , IL-6, and IL-12 through Toll-like receptor 9. The finding of TTV in high viral load in infectious endophthalmitis samples leads to a number of possible hypotheses including: inflammation directly related to infection, TTV modulating the immune system to increase susceptibility to bacterial co-infection, a proinflammatory state causing culture negative endophthalmitis, or breakdown of the blood-retinal barrier allowing the virus to replicate in the vitreous.

(No Image Selected)

Commercial Relationship(s) Disclosure:

Aaron Lee: Commercial Relationship(s);Cogent 14 Productions LLC (threeplus.org):Code P (Patent)

Lakshmi Akileswaran: Commercial Relationship: Code N (No Commercial Relationship)

Michael Tibbetts: Commercial Relationship: Code N (No Commercial Relationship)

Sunir Garg: Commercial Relationship(s);Lux:Code F (Financial Support);EyeGate:Code F (Financial

Support);Regeneron:Code F (Financial Support);Genentech:Code F (Financial Support);Allergan:Code C (Consultant)

Russell Van Gelder: Commercial Relationship(s);Novartis:Code F (Financial Support)

Grant Support: Yes

Support Detail: Burroughs-Wellcome Translational Scientist Award, Research to Prevent Blindness, NIH P30 EY001730, NIH R01 EY022038

Clinical Trial Registration: No

Other Registry Site:

Registration Number: