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Novel Detection of *Leishmania* RNA Virus-1 in Clinical Isolates of *Leishmania Viannia panamensis*

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Abstract:

American tegumentary leishmaniasis (ATL) comprises a discrete set of clinical presentations of leishmaniasis endemic to Central and South America. *Leishmania* RNA virus-1 (LRV-1) is a double stranded RNA virus identified in 20-25% of *Leishmania Viannia braziliensis* and *L. V. guyanensis*, and is believed to be a predictive biomarker of severe ATL. To date, LRV-1 has been reported in other members of the *Viannia* complex including *L. V. peruviana* and *L. V. lainsoni*, however not in *L. V. panamensis*. We describe the novel detection of LRV-1 in *L. V. panamensis* and its associations with clinical phenotypes of ATL. Clinical isolates identified as *L. V. panamensis* by PCR, RFLP analysis, and Sanger sequencing at our institutions between 2012 and 2018 were screened for LRV-1 by real-time PCR. Isolates were stratified according to clinical phenotype: localized cutaneous leishmaniasis (LCL) was defined as "non-severe" ATL, whereas "severe ATL" was defined as mucosal or mucocutaneous leishmaniasis (ML/MCL); erythematous, purulent, or painful ulcers and/or lymphatic involvement (inflammatory ulcers); or multifocal/disseminated ulcers (≥ 4 in ≥ 2 anatomic sites). Of 22 isolates of *L. V. panamensis*, represented countries of acquisition were Peru (n=9, 41%), Costa Rica (n=7, 32%), Ecuador (n=5, 23%), and Panama (n=1, 0.5%). The severe phenotype occurred in 9 (41%) of infections, and non-severe in 13 (59%). Of 9 severe cases, 3 (33%) were due to LRV-1-positive isolates of *L. V. panamensis* while 4 (31%) of 13 non-severe cases were LRV-1 positive (p=0.90). Median age of patients did not differ by clinical phenotype (45.8 years in severe ATL vs. 31.9 years in non-severe ATL, p=0.09), or LRV-1 status (34.1 years in LRV-1 positive cases vs. 38.3 years in LRV-1 negative cases, p=0.64). Differences in sex were not observed with either clinical phenotype (p=0.60) or LRV-1 status (p=0.52). We describe the novel detection of LRV-1 in isolates of *L. V. panamensis* from both Central and South America. Although LRV-1 is postulated to influence disease severity in *L. V. braziliensis* and *L. V. guyanensis* infections, we failed to demonstrate such an association in this small sample of *L. V. panamensis* isolates. The role of LRV-1 in clinical phenotypes of *L. V. panamensis* requires further exploration.