O39-04: COMBINING HUMAN SEROSURVEILLANCE WITH MOLECULAR XENOMONITORING IN TWO ENDEMIC VILLAGES FOR VISCERAL LEISHMANIASIS SURVEILLANCE IN SARAN, BIHAR, INDIA

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As India prepares for post-elimination of visceral leishmaniasis (VL), it will become much harder to detect human cases, especially if case numbers decrease further or occur in new areas with limited or no surveillance activity. New strategies for surveillance are required, monitoring transmission rather than disease, and targeting both humans and the sand fly vector, *Phlebotomus argentipes*. In 2019, researchers in the SPEAK India molecular xenomonitoring (MX) and surveillance workpackages focused VL detection efforts in endemic villages of Bishambharpur and Rampur Jagdish (having reported VL cases in each of the 3 years prior to the study, i.e. 2016-2018) in the Saran district of Bihar, India. The goal of this work was to assess whether a combined human serological and MX approach allows for detection of ongoing VL transmission. For MX, field teams set 10 CDC light traps in each village every fortnight in households that consented to participate in the study from June to September 2019. Sand flies were first sorted from other vectors (i.e. mosquitoes) then by sex and genus and stored at -20 C. They were later dissected and stored as individual heads and pooled thorax-abdomen sections grouped by date and village of collection. Upon DNA extraction, a quantitative polymerase chain reaction assay targeting the conserved REPL repeat region repeats of *Leishmania donovani* was used to detect infection if Ct values were ≤ 30. For serosurveillance, all

inhabitants of the two villages ≥2 years old were requested to provide a capillary blood sample for testing with the rK39 Rapid Diagnostic Test (RDT) on the spot, and collection on a filter paper for testing with Direct Agglutination Test (DAT) and rK39 ELISA. Demographic and VL-related events were collected for each inhabitant. Overall and age group specific seroprevalences were calculated per test. A total of 727 females *P. argentipes* in 79 pools were analyzed. No pools were positive for *L. donovani*. Blood samples were provided by 2756 (76%) inhabitants of Bishambharpur and 2773 (74%) of Rampur Jagdish. Both villages had 35 participants reporting a VL history. RDT and DAT seroprevalence was relatively low in all age groups in both villages (<2%). ELISA seroprevalence on the other hand was high (>8%) in all age groups in Bishambharpur, which had continuous cases during and after the study period. This in contrast to Rampur Jagdish which showed ELISA seroprevalence <2.5% in all age groups, but did not have any new VL cases reported since the start of the study. Though no positive sandfly pools were detected, serosurveillance was able to detect current infections in the two villages and seems the more sensitive approach in detecting VL transmission. The rK39 ELISA seemed to reflect current transmission well, although this finding is based on high ELISA seroprevalence in one village only. More frequent and targeted sand fly collection events may have resulted in increased infection detection, specifically if traps were set in households of infected inhabitants. This combined approach may be useful in confirming focal transmission sites during the elimination phase of VL.

Keywords MOLECULAR XENOMONITORING; VL DETECTION; SEROSURVEILLANCE; VISCERAL LEISHMANIASIS; VECTOR SURVEILLANCE

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