Lyme borreliosis (LB) diagnosis currently relies mainly on serological tests and sometimes polymerase chain reaction or culture. However, other biological assays are being developed to try to improve Borrelia-infection diagnosis and/or monitoring” Raffetin et al (2019).

Abstract:

Background: Lyme borreliosis (LB) diagnosis currently relies mainly on serological tests and sometimes polymerase chain reaction or culture. However, other biological assays are being developed to try to improve Borrelia-infection diagnosis and/or monitoring.

Objectives: To analyze available data on these unconventional LB-diagnostic assays through a systematic literature review.

Methods: We searched PubMed and Cochrane Library databases according to the PRISMA-DTA method and the Cochrane Handbook for Systematic Reviews of Interventions.

We analyzed controlled and uncontrolled studies (published 1983–2018) on biological tests for adults to diagnose LB according to the European Study Group for Lyme Borreliosis or the Infectious Diseases Society of America definitions, or strongly suspected LB.

Two independent readers evaluated study eligibility and extracted data from relevant study reports; a third reader analyzed paper full-texts to resolve disagreements.

The quality of each included study was assessed with the QUADAS-2 evaluation scale.

Results: Forty studies were included: 2 meta-analyses, 25 prospective, controlled studies, 5 prospective, uncontrolled studies, 6 retrospective, controlled studies, and 2 case reports. These biological tests assessed can be classified as: (i) proven to be effective at diagnosing LB and already in use (CXCL-13 for neuroborreliosis), but not enough yet standardized; (ii) not yet used routinely, requiring further clinical evaluation (CCL-19, OspA and interferon-α); (iii) uncertain LB-diagnostic efficacy because of controversial results and/or poor methodological quality of studies evaluating them (lymphocyte transformation test, interferon-γ, ELISPOT); (iv) unacceptably low sensitivity and/or specificity (CD57+ NK cells and rapid diagnostic tests); and (v) possible only for research purposes (microscopy and xenodiagnoses).
Discussion: QUADAS-2 quality assessment demonstrated high risk of bias in 25/40 studies and uncertainty regarding applicability for 32/40, showing that in addition to polymerase chain reaction and serology, several other LB-diagnostic assays have been developed but their sensitivities and specificities are heterogeneous and/or under-evaluated or unassessed. More studies are warranted to evaluate their performance parameters. The development of active infection biomarkers would greatly advance LB diagnosis and monitoring.

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Reference:
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