

Vector-Borne Infection Research-Analysis-Strategy



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This is an example to show the type of simple research that could be done, and probably should have been done long ago.

A Prospective Study to estimate the prevalence of Lyme borreliosis in UK patients diagnosed with long-standing moderate to severe Myalgic Encephalomyelitis (M.E.)

Research objective

To estimate the infection rate of Lyme borreliosis amongst patients diagnosed with long-standing moderate to severe Myalgic Encephalomyelitis (M.E.), sometimes diagnosed by the NHS as 'ME/CFS', but which here defines patients who meet International Consensus Criteria.

Description

Participants will be tested for the presence of various laboratory indicators of infection with Lyme borreliosis spirochaetes. Blood samples tested by multiple methods at different laboratories will maximise the chances of detection.

Participant selection

Participants will be 18 years or older, diagnosed with ME/CFS for more than 3 years, and significantly affected, being signed-off sick by their GP from work or study or equivalent impairment.

Design

Blood or plasma samples as required by the testing laboratory, will be prepared in suitable aliquots at a phlebotomy clinic and sent to laboratories for tests to identify the presence of spirochaetes, borrelia specific proteins, borrelia DNA and borrelia specific antibodies.

Laboratory Measures

Whole Cell Sonicate and C6 ELISA's and Western blot (Innatoss)

Elispot test for Lyme borreliosis. PCR. (ArminLabs/Igenex)

Culture and identification of spirochaetes by darkfield microscopy, immunofluorescent anti-borrelia antibody and PCR (Advanced Laboratory Services)

All test strips or copies with density readings, micrographs and data returned to the collating centre.

Symptom Measures

Horowitz Lyme Questionnaire

SF-36 Physical Function subscale
Burrascano Symptom Checklist

Analysis and Report

Results of the experiment will be presented as the presence or absence of the various indicators as reported by the testing laboratory. These data will be supplemented with the Horowitz Lyme Questionnaire, Burrascano Symptom Checklist and SF-36 physical function subscale. These will provide data for correlating symptoms, risk factors and laboratory indicators and allow a weighted estimate of infection amongst participants.

Rationale

Lyme borreliosis is under-diagnosed in the UK. Many doctors and the public do not recognize the risk factors, signs or symptoms of the disease. Examination and standard blood tests of patients frequently show no specific abnormality. Infected patients who become and remain chronically ill must eventually get a diagnosis of something. Given the symptom profile overlaps and the lack of an alternative explanation for the patient's illness, the most likely diagnosis is ME/CFS.

In an online survey of 330 Lyme borreliosis patients conducted by VIRAS (<http://counsellingme.com/VIRAS/LymeTestDelayFinal.pdf>) 78% of patients experienced long delays in getting tested for Lyme disease because "My doctor thought the symptoms were something else". The next highest factors in delaying testing were: "My doctor did not know about Lyme disease", then, "I did not know about Lyme disease". In another VIRAS survey of 130 UK Lyme disease patients, 62% had previously been diagnosed with either M.E. or CFS (http://counsellingme.com/VIRAS/SurveyNov30_9a.pdf).

The NICE guidelines for ME/CFS (CG53, 2007), state that in 'moderate' to 'severe' ME/CFS, a patient has usually stopped work or study. ME/CFS patients who do not recover relatively quickly (within a few years), have a poor prognosis. Although most improve to a degree over time and some have relapses, partial remissions or a deteriorating course, only around 10% are believed to recover their former health.

There is no known cause for ME/CFS. Unlike many other chronic illnesses, patients with ME/CFS and chronic Lyme borreliosis are notable for frequently having a wide range of symptoms which may come and go. Another illness which is notorious for causing many varied symptoms, is untreated or failed-treatment syphilis in the tertiary stage. Syphilis is another spirochaete infection, which like Lyme disease, can affect any organ or system in the body. This resulted in syphilis being called "The Great Imitator," because the symptoms could appear like so many other diseases. Lyme disease is the "New Great Imitator".

In the same survey conducted by VIRAS of 130 UK Lyme disease patients, 70% had 20 or more symptoms from a limited list. The *Burrascano Symptom Checklist* for Lyme disease details 70 possible symptoms that Dr Burrascano has documented in patients. In *The Complete Guide to Chronic Fatigue Syndrome*,

author Dr Katrina Berne, lists 145 symptoms which can occur in patients with ME/CFS.

Signs suggestive of the presence of Lyme disease are comparatively rare in the UK. Lyme arthritis is rare with European strains of Lyme borreliosis and presents in less than 1% of cases. Lyme carditis is rare and presents in only 1% of UK Lyme cases. Acrodermatitis chronica atrophicans is rare in the UK, and occurs in less than 1% of cases. Even the over-emphasised erythema migrans rash, occurs in only around 25% of cases. Exaggeration of the incidence of this 'bull's-eye' rash, has probably contributed to many cases of infection being overlooked. (<http://apps.who.int/iris/handle/10665/62025>)

In 1993, in *The Report of a WHO workshop on Lyme borreliosis*, convened by the World Health Organisation, it is stated that in research, diagnostic laboratory methods should include dark-field microscopy, bright-field microscopy with both simple and complex staining, laboratory culture, direct and indirect immuno-fluorescence, PCR and immuno-blot technology. In other words, the full range of currently available methods.

In 2002, Tylewska-Wierzbanska and Chmielewski concluded that: "There is no correlation between the level of antibodies (ELISA), the number of protein bands (Western blot) and the presence of spirochetes in body fluids (culture and PCR), indicating that in addition to serological testing the use of PCR and cultivation in the diagnosis of Lyme borreliosis should be recommended." (<https://www.ncbi.nlm.nih.gov/pubmed/12422608>)

Therefore amongst UK patients diagnosed with ME/CFS there will almost certainly be some unrecognised cases of Lyme borreliosis. Employing multiple testing methods as suggested in the World Health Organisation report and Tylewska-Wierzbanska and Chmielewski, could provide valuable insight into how many these might be.