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LETTER TO THE EDITOR

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Dear Editor,

We read with interest a recent review article in the present journal in which evidence in favour of *Borrelia burgdorferi* as an aetiological agent of vasculitis and stroke was presented.[1] A more controversial issue seems to be the possible role of *Borrelia burgdorferi* sensu lato (BBSL) in the development of dilated cardiomyopathy (DCM).[2–5] The pathophysiological process leading to DCM is presumed to be due to the persistence of BBSL in myocardium of infected patients after an episode of myocarditis leading to the production of anti-endothelial or/and anti-heart antibodies and therefore to the development of an apparently 'idiopathic' DCM (iDCM).[4] The arguments for such process were: BBSL positive serology, BBSL detection in endomyocardial biopsies (EMBs) using microscopy or polymerase chain reaction (PCR) assays and improvement of patient's cardiac condition after treatment by ceftriaxone.[6]

However, at the opposite end of cardiac conduction abnormalities,[7] the response to such antibiotic treatment was not present in all iDCM patients suggesting an absence of active BBSL infection despite positive serological and/or molecular detection assays.[6] Moreover, systematic treatment of iDCM patients could not be considered in clinical practice because exposure to ceftriaxone may lead to acquiring extended-spectrum β-lactamase-producing gram-negative rods that are now one of the main health concerns worldwide. Taking into account all these elements, physicians in care of iDCM patients shall try to predict which patient may benefit from an antibiotic treatment by ceftriaxone only with the help of clinical context and biological investigations. This point remains difficult in clinical practice because previously reported cases [2–4] were based on direct bacteriological examination, culture or PCR assays on EMBs, whose indications are limited in clinical practice, according to the current American Heart Association (AHA) and European Society of Cardiology (ESC) recommendations.[8]

Because serological screening remains the sole non-invasive test in this setting, we performed a BBSL serological screening of IgG and IgM using ELISA Enzygnost borreliosis VIse (Siemens®) in the serum or plasma of 15 patients suffering from iDCM and followed regularly in Reims University Hospital. All of these patients were living in North-eastern France where Lyme borreliosis is endemic.[9] EMBs had been prospectively performed in 10 out of the 15 study iDCM patients, according to AHA and ESC recommendations.[8] All sera with positive or borderline BBSL antibody results were tested by Western blot analysis (Borreliosis reference centre's in-house immunoblot assay using *Borrelia garinii* IB6 antigens). Western blot analysis was interpreted as positive in case of reactivity to more than 4 BBSL antigens. EMBs were also routinely screened by PCR for the presence of common cardiotropic viruses (Enterovirus, Parvovirus B19, Human Herpes Virus) using Argene Biomerieux® commercial kits, according to manufacturer's instructions. Clinical data were extracted from medical records. The Hospital Ethics Committee approved the study, and informed consent had previously been obtained from each of the patients.

Results are depicted in the Table 1. BBSL seroprevalence reported in our study's population was zero [95% confidence interval: −0.07 to 0.19]; excluding the implication of BBSL in the development of DCM in any of our 15 study patients that were all living in Northern France. Therefore, we did not perform BBSL detection by PCR assays in available EMBs because

Table 1. Clinical and demographic data of patients suffering from idiopathic dilated cardiomyopathy living in North-eastern France, who were screened for *Borrelia burgdorferi* sensu lato.

No.	Age (y)	Rural setting	LVEF (%)	Time course of disease (years)	EMB	Viral genome detection (PVB19 viral load cp/μg)	BBSL serological screening (number of antigens reactive in WB)
1	44	No	26	1	Yes	PVB19 (192); EBV	–
2	46	Yes	25	2	Yes	–	–
3	46	No	33	2	Yes	PVB19 (15)	–
4	49	No	25	2	Yes	EV; HHV6	–
5	66	Yes	25	2	Yes	PVB19 (175); EV	–
6	49	Yes	26	2	Yes	PVB19 (378)	–
7	64	No	25	2	Yes	–	–
8	56	Yes	13	2	Yes	PVB19 (610); EBV; HHV6	–
9	47	Yes	32	2	Yes	PVB19 (1822)	–
10	25	Yes	25	2	Yes	PVB19 (29)	–
11	66	No	20	2	No	–	–
12	64	No	25	2	No	–	Doubtful (4)
13	65	Yes	30	4	No	–	–
14	60	No	25	3	No	–	–
15	52	Yes	15	1	No	–	–

LVEF (%), left ventricle ejection fraction (%); EMB, endomyocardial biopsy; BBSL, *Borrelia burgdorferi* sensu lato, WB, Western blot.

(i) negative predictive value of negative BBSL serology at the late stage of the disease is considered to be higher than 99%,[10] especially as BBSL serology is considered as positive only in presence of positive ELISA and confirmed in Western blot analysis; (ii) outer surface protein A gene PCR gave non-specific results in case of simultaneous detection of Human Herpes Virus 6 or Parvovirus B19 genomes in cardiac tissues [4]; which occurred frequently in EMB samples (Table 1).

Despite the low number of tested cases, the non-existent BBSL seroprevalence reported here, advocates against the potential aetiological role of BBSL in the development of unexplained DCM and against the systematic use of ceftriaxone in idiopathic DCM patients in Northern France. The use of ceftriaxone should only be limited to: (i) DCM patients whose diagnosis of late Lyme borreliosis has been established as probable by a systematic approach taking into account previous medical history including exposure to tick bites, complete clinical examination associated with BBSL fully positive serology and with the absence of all other aetiological causes of DCM; (ii) DCM patients living in BBSL endemic area with a BBSL positive serology and requiring an heart graft. In this latter situation, treatment by ceftriaxone could be initiated before heart transplantation and definitive confirmation of diagnosis using reference PCR assays on explanted heart tissues.

Disclosure statement

No competing financial interests exist.

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