

Acute cardiovascular conditions in the setting of multiple sclerosis relapse: Practical implications

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In clinical practice, chronic demyelinating syndromes including multiple sclerosis (MS) generally present with relapses and remissions and are well known to be associated with an increased risk for cardiovascular disease possibly due to a variety of factors including chronic inflammatory burden [1, 2], sedentary lifestyle, etc. In their recently published article, Łagosz et al. [1] have reported an interesting case of acute myocardial infarction (AMI) in a male patient during his MS relapse possibly triggered by a SARS-CoV-2 vaccination [1]. In this regard, we would like to comment on this case report and also highlight a variety of acute cardiovascular conditions in patients with an MS relapse.

First, it seems quite evident that a variety of MS and/or vaccine-related factors might have triggered the evolution of AMI in this case [1]. Certain cytokines including interleukin 2 (IL-2), etc. were previously suggested to account for pathogenesis, relapse, and progression of MS largely through autoimmune pathways [2]. In particular, heightened disease activity in MS might lead to acute increases in cytokine levels [2]. This potentially suggests a cytokine-related atherosclerotic plaque rupture in the patient during his MS relapse. Therefore, we wonder about the severity of systemic inflammation in the patient [1]. On the other hand, we hold the opinion that vaccine-related in-situ thrombus formation (associated with hypercoagulation [1] or autoimmune vasculitis) seems to be a more likely trigger of AMI in this context. This possibility might also warrant examination of a variety of arterial and venous structures (deep veins, cranial arteries, etc.) for subtle complications (including subclinical thrombosis, aneurysm

formation) in the patient. In general, only histopathological examination (mostly performed during autopsy) can unveil the absolute mechanism of acute coronary occlusion in the presence of multiple triggers.

Second, an episode of takotsubo syndrome (TTS) (co-existing with AMI) might also be quite likely and might have been masked by AMI and acute neurological events in the patient [1]. In particular, MS and Bickerstaff's brainstem encephalitis might induce TTS episodes especially during their relapses through a variety of mechanisms, including involvement of the primary autonomic center (located in medulla oblongata), emotional stress, enhanced systemic inflammation, as well as paradoxical increments in orexin (a neuropeptide that has important pathogenetic implications in certain neurodegenerative diseases and has a substantial impact on adrenergic discharge) levels [3]. Interestingly, certain clinical features including systemic inflammation, old age and severe physical conditions (possibly consistent with the features of the patient [1]) might be particularly associated with the co-existence of TTS and acute coronary syndromes (ACSs) which might lead to worse outcomes [4]. Therefore, the presence of severe stenosis or total occlusion consistent with ACSs, as visualized on the coronary angiogram (CAG), could not safely rule out an accompanying TTS episode [4]. Accordingly, we wonder about findings of left ventriculogram (apical ballooning, etc.), if any, in the patient. Taken together we would like to underscore the potential likelihood of TTS occurrence in this case and in similar clinical scenarios (either in isolation or co-existing with ACSs).

Finally, the risk of idiopathic cardiac arrhythmias might also increase during an MS relapse as a consequence of cytokine impact and autonomic imbalance, etc. [2]. This possibly warrants close rhythm monitoring until the remission of neurological findings [2]. Therefore, we wonder whether the patient had any arrhythmic episodes [1].

In conclusion, a variety of acute cardiovascular conditions might be encountered during the course of MS relapses [2, 3]. However, these conditions might present with atypical or vague symptoms [1] or might be masked by the rampant neurological findings [3]. This warrants close supervision of cardiac symptoms [2] and routine evaluation of basic tests (troponins, echocardiogram, etc.), and where necessary, implementation of advanced modalities (including CAG) for prompt cardiovascular management in patients with an MS relapse.

Article information

Conflict of interest: None declared.

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