Accelerated Cure Project for MS

November 2017

Accelerating research towards a cure for multiple sclerosis

Comorbidities and MS Disease Activity

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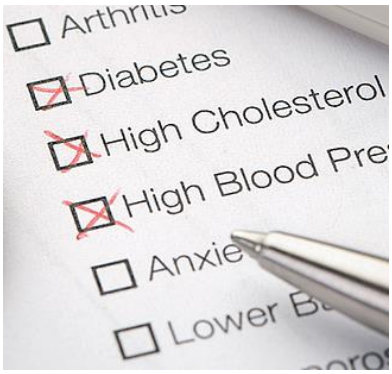

Multiple sclerosis (MS) is a burdensome condition and for decades there has been limited acknowledgement of other medical conditions that co-occur in persons with MS (PwMS). Thus, for many who sought exclusively specialty care (i.e. seeing primarily a neurologist), other aspects of health might be overlooked by excellent MS-*centric* care. However, that paradigm is finally shifting and there is an active and ongoing conversation about the role of comorbid/co-occurring conditions in MS. This conversation is extremely relevant to all PwMS, as 75% of PwMS will have at least one other comorbid condition (i.e. anxiety and type 2 diabetes). A 2015 systematic review reported the top comorbidities experienced by PwMS were depression (24%), anxiety (22%), hypertension (19%), hyperlipidemia (11%), chronic lung disease (10%), and diabetes (9%).[1] In the last few years, there has been a steady stream of MS publications describing the impact of comorbid conditions on quality of life, risk of hospitalizations, healthcare costs, depression, and disability. The key reason to investigate comorbidities in MS is to understand how we can optimize care, as well as identifying shared biological mechanisms underpinning MS and the co-occurring to inform future research.

This month, two studies reported on the impact of comorbidities on outcomes related to disease activity – relapses and brain volume. The first study, by Kowalee et al. published in *Neurology*[2], involved PwMS visiting one of four MS clinics in the Canadian provinces of Nova Scotia, Manitoba, Alberta, or British Columbia who had relapsing remitting onset. Of the 1,632 clinic patients, 1,130 met inclusion criteria, 949 consented to participate, and 885 of individuals were the focus of the analyses. The participants were interviewed at baseline, and then once at the end of year 1 and then again at the end of year 2. Participants answered questions such as: "Have you ever been diagnosed with the following condition by a physician?" Some of the conditions included thyroid disease, osteoporosis, cataracts, diabetes mellitus, migraine, and hypertension. The medical records for each participant were also reviewed and information such as date of birth, race, current disease-modifying therapies, and numbers of relapses since last clinic visit were extracted. On average 13-15% of participants reported having at least one relapse in the year prior each interview, and relapses, as expected, decreased with age. The researchers then looked at the relationship between number of comorbidities reported at baseline and the number of relapses experienced over the following two years. Having 3 or more comorbidities resulted in a 45% increased risk of having a future relapse. The researchers also looked at the individual comorbidities, and having migraines increased risk of experiencing a relapse in the following year by 38%, while high cholesterol increased risk of a relapse by 67%.

The second study out of Austria, by Pichler at al. published in *Multiple Sclerosis Journal*[3], involved 82 individuals with Clinical Isolated Syndrome (CIS; those who have not yet fully developed MS) or were in the early stages of relapsing-remitting MS seeking care at an MS outpatient clinic. The primary research aim was to investigate whether vascular risk factors influence brain volume and lesion load in those in the early stages of MS. Participants completed a questionnaire and were encouraged to return to the clinic every 6 months. Details on vascular risk factors were extracted from the medical records, including smoking status and a diagnosis of hypertension, high cholesterol, type 2 diabetes, and/or heart disease. MRIs at baseline and at least 18 months after baseline were extracted as well. Using the MRIs the researchers generated multiple different measures of brain volume and lesion load. The patients were divided into two groups: 1) having no vascular risk factors or 2) having at least one vascular risk factor. The two groups did not differ by onset age, age at interview, gender, and other clinical and demographic traits at baseline. When looking at all participants at baseline, those with a vascular risk factor did have a smaller than normal

appearing brain volume, smaller cortical grey matter volume, and less white matter volume than those who did not have a vascular risk factor. This relationship persisted at follow-up. Similar results were observed when restricted to those with CIS. Interestingly, vascular risk factors did not affect lesion load.

Together, these results emphasize the importance of continued health promotion and preventative care in PwMS, and not care solely focused on the management of MS. These studies add to the growing literature on the adverse impact of other (common) health conditions on MS outcomes, and the need for proactive health management to address these modifiable health conditions (i.e. high cholesterol, smoking, high blood pressure, etc.). It also should motivate those with MS to be their own health champions and seek care that promotes wellness and not just symptom management.

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4361468/
2. https://www.ncbi.nlm.nih.gov/pubmed/29117961
3. https://www.ncbi.nlm.nih.gov/pubmed/29027843