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Don't Forget the Brain: Lifestyle Medicine in the Century of Neurodegeneration

Abstract: *Neurology is often not discussed in lifestyle medicine circles, but it might be an area that will propel the cause of lifestyle medicine in the future. This is especially relevant in increasingly common neurodegenerative conditions such as Alzheimer's disease, which have no known disease modifying therapy but lifestyle factors are implicated in causation.*

Keywords: neurodegeneration; lifestyle change; lifestyle medicine; cognitive decline

> I can think of no other disease that has such a profound effect on loss of function, loss of independence, and the need for care. I can think of no other disease so deeply dreaded by anyone who wants to age gracefully and with dignity. I can think of no other disease that places such a heavy burden on families, communities, and societies. I can think of no other disease where innovation, including breakthrough discoveries to develop a cure, is so badly needed.
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> —Dr Margaret Chan, Director-General of the World Health Organization, at the Conference on Global Action Against Dementia, March 2015[1]

In an article titled "A Tale of Coronary Artery Disease and Myocardial Infarction," published in the celebratory 200th year edition of the *New England Journal of Medicine*, the authors shared a success story.[2] They presented data showing a decline in cardiovascular mortality and hinted toward an optimistic outlook, predicated on innovations in surgical and pharmacological interventions. Glaringly absent in the article was the evidence-base for lifestyle interventions in the primary, secondary, and tertiary prevention of cardiovascular conditions. Indeed, one of the greatest impediments to the widespread acceptance and embrace of lifestyle medicine for the prevention and treatment of cardiovascular disease is the availability of other options.

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However, when it comes to neurodegenerative conditions such as dementia, the prevalence and burden of which is rising sharply, treatment options are lacking. Encouragingly, the evidence-base for lifestyle as therapy is emerging.

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Alzheimer's is the only disease in the top 10 causes of death in the United States to rise in the past decade.[3] In 2014, the prevalence of diagnosed Alzheimer's rose by 10%, making it now the sixth leading cause of death.[4] In Australia, if present trends continue, dementia will overtake coronary heart disease as the leading cause of death within 5 years.[5] Indeed, the 21st century is being referred to as "the century of neurodegeneration."[6] As the statistics escalate, the medical profession, from primary care physicians and geriatricians to researchers,[7] and even the World Health Organization (see opening quote) are frustrated by the lack of any effective therapies.

The rise of neurological diseases, specifically dementia, may present lifestyle medicine with a unique opportunity to receive the prominence it deserves. Dementia is "a relentlessly progressive terminal illness"[6] for which there are no surgical or pharmacological treatment options. However, there is good evidence that a healthy lifestyle is protective against the condition.

As much as one third of Alzheimer's disease is attributable to modifiable risk factors, most of which have lifestyle underpinnings: physical inactivity, smoking, hypertension, obesity, diabetes, and depression.[8] Furthermore, the pathogenesis of Alzheimer's disease implicates lifestyle-induced vascular lesions and poor perfusion, to the extent that Alzheimer's is now considered a combination of cardiovascular disease and neurodegeneration.[9] Alzheimer's has also been referred to as "type 3 diabetes"[10] because of the similarities in the risk factors, metabolic disorder, and pathology of the two conditions.[11] As with other chronic conditions, inflammation and oxidative stress have been identified as underpinning the progression of neurodegeneration.[12] These findings highlight the lifestyle connection to neurodegenerative conditions, and it is becoming increasingly clear that a healthy lifestyle can prevent Alzhiemer's.[13]

Furthermore, there is emerging evidence that healthy lifestyle practices may be effective in the management and even treatment of dementia and its associated symptoms. In an article titled "Why Has Therapy Development for Dementia Failed in the Last Two Decades?"[7] Gauthier and associates conclude that the only "encouraging new data" was from the Finnish Geriatric trial where cognitive decline in at-risk individuals was reduced by diet, exercise, cognitive training, and vascular risk monitoring.[14] This large study has lent support to the results of a small study of 10 subjects with dementia where a complex intervention incorporating a healthy diet, sleep hygiene, physical activity, stress management, and nutritional supplements resulted in all but one subject experiencing sustained improvement in cognition and reversal of memory loss.[15]

Are we are at the stage today with neurodegenerative conditions that we were at 35 years ago with cardiovascular disease, when Ornish and colleagues[16] showed the viability of intensive therapeutic lifestyle change?

For many years we have received unsolicited reports from participants in the Complete Health Improvement Program (CHIP)[17] of a "fog lifting from my brain." Presently we are investigating this phenomenon further by exploring changes in cognitive function and decline in response to CHIP (ANZCTR ACTRN12616000720415),[18] but what has been intriguing in conducting the trial is the receptiveness of both participants and medical practitioners. Faced with cognitive decline and a daunting prognosis, participants demonstrated a high readiness for change, while medical practitioners, recognizing the dearth of treatment options, have been refreshingly receptive to lifestyle medicine.

Neurology is often not discussed in lifestyle medicine circles, but it might be an area that will propel the cause of lifestyle medicine in the future. So as we champion lifestyle medicine moving forward, let us not forget about the brain. AJLM

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