

## Is Spinal Cord Atrophy a Distinct Clinical Syndrome?

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Lower brain volume has been found associated with various cardiovascular (CV) risk factors as well as with cognitive dysfunction. Less is known about the other component of the CNS, the spinal cord, Spinal cord (SC) size is widely recognized to be smaller in patients with multiple sclerosis, but has not been well studied in other clinical settings. Older pathological studies have demonstrated atherosclerosis within the spinal arteries and more recently spinal artery atherosclerosis has been linked to progressive myelopathy, lower back pain, lumbar disc degeneration, and vertebral infarction. These findings suggest that chronic SC ischemia may therefore impair mobility, motor strength, and endurance, leading to frailty, a growing concern in the elderly. However, the clinical significance of ischemic myelopathy has largely been dismissed because the spinal arteries are well known to be highly collateralized. This may be viewed from a CV standpoint, as counterintuitive since chronic ischemic cardiac syndromes are relatively common despite having a densely collateralized arterial supply. Since CV disease, cognitive dysfunction and frailty often occur concomitantly and given morphological similarities between the brain and spinal cord, we have embarked on several studies at various stages of completion aimed at determining potential relations between SC size and 1-age, 2-CV risk factors and 3-frailty. We hypothesize that aging and CV risk factors will be associated with smaller SC size, which in turn will be associated with frailty. Our work represents a convergence of multiple specialties (radiology, neurology, CV, pathology) and disciplines (basic science, clinical, epidemiological) and addresses a potentially important and growing concern.