Serum lipid concentrations among persons with spinal cord injury: A systematic review and meta-analysis of the literature

**Background:** Lipid optimization comprises a therapeutic cornerstone of primary and secondary cardiovascular disease prevention. This systematic review and meta-analysis sought to clarify patterns of lipid profiles in spinal cord injury (SCI) patients compared to able-bodied individuals as well as among subgroups of SCI patients stratified by sex, activity level, race, and level of injury.

**Methods:** Searches were conducted in PubMed, CINAHL, PsycINFO, and EMBASE. The initial literature search broadly identified peer-reviewed studies that examined cardiovascular risk factors in SCI. A total of 50 studies were ultimately identified that focused on lipid levels in SCI. Demographic data (including subject age, duration of injury, height, weight, and body mass index [BMI]) and lipid values were extracted for able-bodied individuals and subjects with SCI. Statistical analyses included t-testing and analysis of variance (ANOVA).

**Results:** Compared with controls, individuals with SCI had significantly lower total cholesterol (TC) (183.4 mg/dL versus 194.9 mg/dL, p = 0.019) and high-density lipoprotein cholesterol (HDL-C) (41.0 mg/dL versus 49.6 mg/dL, p < 0.001) and higher TC/HDL-C ratios (4.5 versus 4.0, p = 0.002), though no significant differences were found for triglyceride (TG) and non-HDL-C values.

**Conclusions:** SCI represents an increasingly common chronic condition, now secondarily characterized by heightened CVD risk potentially in part due to unique lipid profiles characterized primarily by low HDL-C and an increased TC/HDL-C ratio. As other at-risk patient populations have received increased acknowledgment with more stringent lipid panel screening at earlier ages and increased frequency, we would propose that the same be implemented for the SCI population until more-specific CVD risk stratification guidelines are established for this population.