JAMA Neurol. 2016 Dec 1;73(12):1468-1476. doi: 10.1001/jamaneurol.2016.3745.

Association Between Metabolic Syndrome Components and Polyneuropathy in an Obese Population.

Callaghan BC[1], Xia R[2], Reynolds E[2], Banerjee M[2], Rothberg AE[3], Burant CF[3], Villegas-Umana E[1], Pop-Busui R[3], Feldman EL[1].

Abstract

Importance: Past studies have shown an association between metabolic syndrome and polyneuropathy, but the precise components that drive this association remain unclear. **Objectives:** To determine the prevalence of polyneuropathy stratified by glycemic status in well-characterized obese and lean participants and investigate the association of specific components of metabolic syndrome with polyneuropathy. **Design, Setting, and Participants:** We performed a cross-sectional, observational study from November 1, 2010, to December 31, 2014, in obese participants (body mass index [calculated as weight in kilograms divided by height in meters squared] of 35 or more with no comorbid conditions or 32 or more with at least 1 comorbid condition) from a weight management program and lean controls from a research website. The prevalence of neuropathy, stratified by glycemic status, was determined, and a Mantel-Haenszel $\chi 2$ test was used to investigate for a trend. Logistic regression was used to model the primary outcome of polyneuropathy as a function of the components of metabolic syndrome after adjusting for demographic factors. Participants also completed quantitative sudomotor axon reflex testing, quantitative sensory testing, the neuropathy-specific Quality of Life in Neurological Disorders instrument, and the short-form McGill Pain Questionnaire. **Exposures:** Components of metabolic syndrome (as defined by the National Cholesterol Education Program Adult Treatment Panel III), including glycemic status (as defined by the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus). **Main Outcomes and Measures:** Toronto consensus definition of probable polyneuropathy. Secondary outcomes included intraepidermal nerve fiber density and nerve conduction study parameters. **Results:** We enrolled 102 obese participants

(mean [SD] age, 52.9 [10.2] years; 48 men and 54 women; 45 with normoglycemia [44.1%], 31 with prediabetes [30.4%], and 26 with type 2 diabetes [25.5%]) and 53 lean controls (mean [SD] age, 48.5 [9.9] years; 16 men and 37 women). The prevalence of polyneuropathy was 3.8% in lean controls (n=2), 11.1% in the obese participants with normoglycemia (n=5), 29% in the obese participants with prediabetes (n=9), and 34.6% in the obese participants with diabetes (n=9) (P<.01 for trend). Age (odds ratio, 1.09; 95% CI, 1.02-1.16), diabetes (odds ratio, 4.90; 95% CI, 1.06-22.63), and waist circumference (odds ratio, 1.24; 95% CI, 1.00-1.55) were significantly associated with neuropathy in multivariable models. Prediabetes (odds ratio, 3.82; 95% CI, 0.95-15.41) was not significantly associated with neuropathy. **Conclusions and Relevance:** The prevalence of polyneuropathy is high in obese individuals, even those with normoglycemia. Diabetes, prediabetes, and obesity are the likely metabolic drivers of this neuropathy.
PMID: 27802497 [Indexed for MEDLINE]