

Quick Review of Model System Research

Adiponectin Is a Candidate Biomarker of Lower Extremity Bone Density in Men With Chronic Spinal Cord Injury¹

What is the study about?

Generally, obesity is associated with greater bone mineral density (BMD). However, there are additional factors that affect the relationship between fat tissue and BMD. This study investigates the relationships between BMD, walking status, and molecules released by fat tissue in men with chronic spinal cord injury (SCI). Specifically, the study targets two types of molecules released by fat tissue, leptin and adiponectin.

Who participated in the study?

Participants included 149 males with SCI who were 22 years of age or older. The participants had injuries that occurred at least one year before the study began, were not dependent on ventilators, did not have tracheostomy (surgical procedure to create an opening through the neck), and did not have any other neuromuscular diseases. Participants were categorized as walkers (with aids such as a crutch or a cane) or wheelchair users.

How was the study conducted?

Blood samples were used to measure adiponectin and leptin in participants who fasted or had light snacks. Bone formation was assessed by measuring the level of osteocalcin (type of protein involved in building bones), while C-telopeptide levels in plasma were used as an indicator of bone decay. In addition, BMD and body composition were measured by a dual x-ray absorptiometry scanner. Statistical analysis was used to determine if there was an association between adiponectin and leptin levels and BMD.

What did the study find?

The study found differences between walkers and wheelchair users in the variables measured. The walkers had a positive association between BMD and weight, Body Mass Index (BMI) and lean mass but none of the proteins. Participants categorized as wheelchair users had an inverse relationship between their adiponectin levels and their BMD. This suggests that the more adiponectin participants had, the lower their bone density. Thus, adiponectin might be useful in measuring BMD for men with SCI who are wheelchair users. The study also showed that there is no association between adiponectin levels and BMD in walkers.

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¹ Doherty, A.L., Battaglini, R.A., Donovan, J., Gagnon, D., Lazzari, A., ... Morse, L.R.. (2013). Adiponectin is a candidate biomarker of lower extremity bone density in men with chronic spinal cord injury. *Journal of Bone and Mineral Research*, *Epub ahead of print*