

THE EFFECTS OF VITAMIN D ON FALLS AND PHYSICAL FUNCTION IN OLDER ADULTS: A SYSTEMATIC REVIEW

Joy C. Kuebler and J. Tyler Stewart

The University of Mississippi Medical Center, School of Health Related Professions, Department of Physical Therapy, Jackson, MS 39216

Corresponding Author: Joy C. Kuebler <jkuebler@umc.edu>

ABSTRACT

BACKGROUND AND SIGNIFICANCE: Decreased bone mineral density and muscle weakness are generally accepted by the medical community as risk factors for accidental falls in older adults and supplementation of Vitamin D can have positive effects on density and strength. The objective of this review is to establish the effectiveness of vitamin D supplementation on falls and fall risk for community-dwelling older adults.

METHODS: Following PRISMA guidelines, PubMed and Embase databases were searched using criteria for inclusion 1) participants were community-dwelling adults age 65 or older 2) intervention of oral vitamin D supplementation 3) measured fall rates and/or timed up and go (TUG) scores 4) participants with no major medical diagnoses with exception of low serum vitamin D levels 5) published within the last 10 years.

RESULTS: Nine studies met the inclusion criteria: two “moderate” quality, PEDro 6/10, and seven, “high” quality, PEDro 9/10 or 10/10.

DISCUSSION AND CONCLUSION: The majority of the studies demonstrated that oral vitamin D supplementation had no or even detrimental effects on incidence of falls for community-dwelling older adults. There is an absence of convincing evidence to support vitamin D as an appropriate intervention for the reduction of incidence or risk of falls in community-dwelling older adults.

Keywords: Vitamin D, Accidental Falls, Activities of Daily Living, Aged

INTRODUCTION

Fall prevention in older adults is of increasing concern as falls attributed to \$30 billion of Medicare spending alone in 2012 in addition to the result of debilitation and injury that often occurs with falls.[1] While decreased muscle strength and bone mineral density are known risk factors for accidental falls in aged individuals, increasing research has demonstrated that higher serum levels of 25-hydroxyvitamin D [25(OH)D] are associated increase bone mineral density as well as increase skeletal muscle strength.[2], [3], [4] Thus, in theory, supplementation of vitamin D could provide a practical and inexpensive means of decreasing fall risks in older adults. The purpose of this systematic review was to establish the effectiveness of vitamin D supplementation alone or in combination with other interventions on falls, fall risks, or physical function in 65+ year old community-dwelling older adults.

METHODS

The online databases PubMed and Embase were searched in October 30, 2017 using search terms related to vitamin D, accidental falls, and age. A ten-year limit was applied for the publication date of resulting studies. The search was limited to articles involving human subjects and publication in English or with English-translated editions.

Inclusion criteria were participants defined as community-dwelling individuals of the age 65 and older, vitamin D supplementation used as an intervention, use of outcomes that objectively measure fall rates and/or fall risks and/or physical function, participants with no major medical diagnosis, with the exception of low serum vitamin D levels, and studies published within the last ten years. Due to the ambiguity of the term “fall”, the authors decided upon the operational definition of fall as “unintentionally coming to rest on the ground, floor, or lower level.” Research articles not in English or without English