

# Bone mineral density and body mass index of spinal cord injured wheelchair users before and after acute rehabilitation period - pilot study



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## Introduction

Prevention and treatment of osteoporosis are essential to avoid additional functional impairment and increased costs due to long-term hospitalization. Nevertheless, it is not clear if early verticalization, physical activity, vitamin D and calcium intake are helpful for patients with SCI. Therefore, further investigations are necessary. The present study aimed to determine bone mineral density (BMD) and body mass index (BMI) at the beginning of first acute rehabilitation period and to find out if these parameters change a half year later when regular verticalization in hospital and counseling in respect of nutrition and physical activity were provided.

## Methods

11 subjects (age 45.0±19.90) with tetra- (n=6) and paraplegia (n=5) who used a manual wheelchair as the primary mode of mobility underwent dual-energy x-ray absorptiometry (DXA) examinations as part of their medical evaluation to determine BMD in femoral bone and BMI. Data were collected retrospectively. Standard statistical methods were used for analysis. The average length of inpatient rehabilitation period was 74.36±36.29 days, time from injury to first measurement 10.18±6.31 months, and the period between two measurements was 7.09±1,81 months.

## Results

The mean femoral neck T-score was at the beginning of rehabilitation -1.56±1.52 on the right and -1.40±1.29 on left femur (Figure 1). After rehabilitation period T-score was decreased 26.2% (-1.97±1.44) on right and 40.9% (-1.97±1.27) on left femur. T-score of three patients changed from osteopenia to osteoporosis and of one from normal to osteopenia.

## Conclusions

Ten months after injury SCI wheelchair users' BMD corresponds to osteopenia and, despite verticalization and counseling during rehabilitation, it remained significantly reduced after seven months. BMI (Figure 2) and lean mass (Figure 3) didn't change remarkably, but fat mass increased 6.3% (Figure 3). Further investigations with more participants would hypothetically show a significant difference in the changes of lean mass and BMI.

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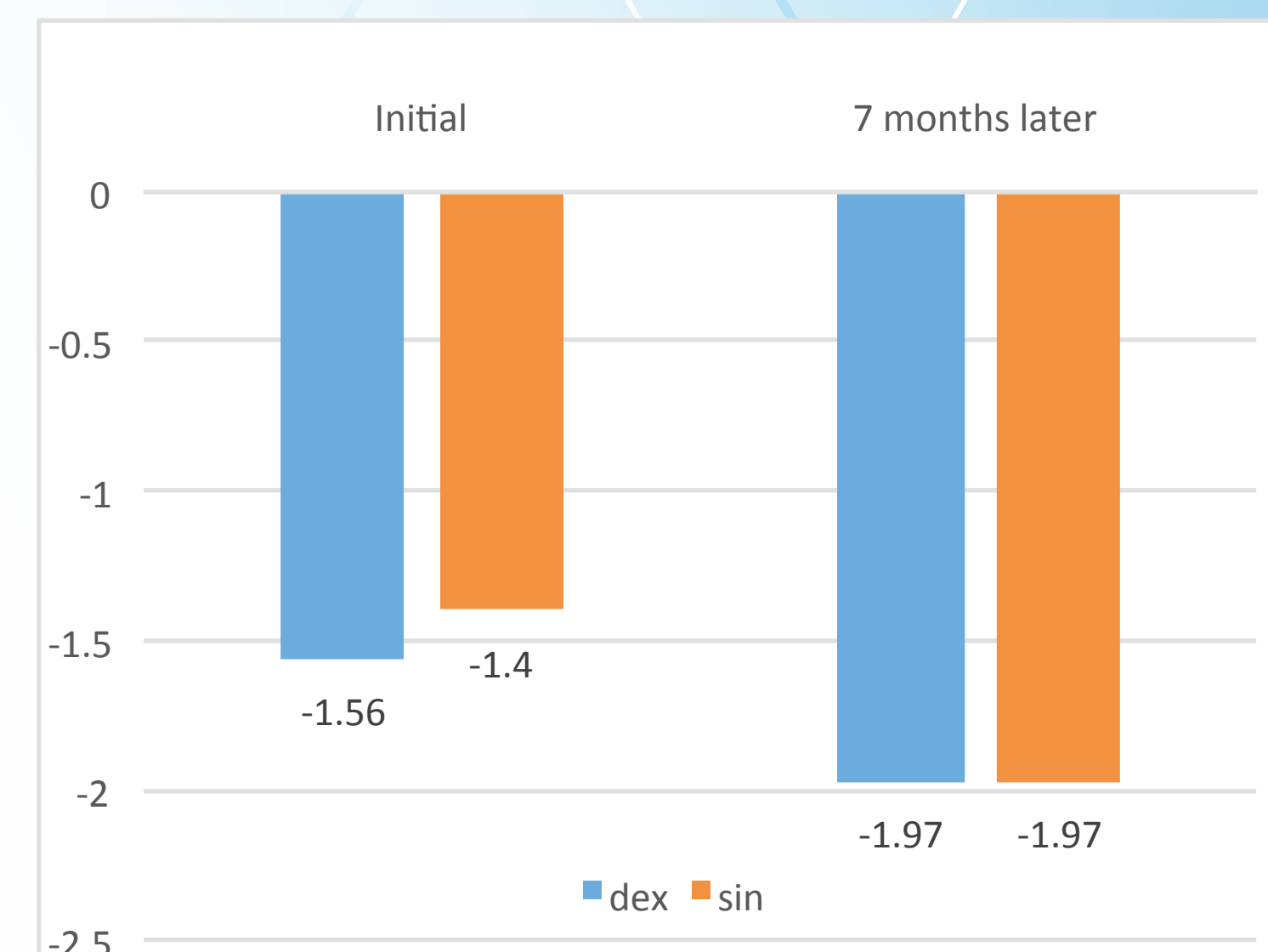


Figure 1. Femoral neck T-score at the beginning and after rehabilitation period.

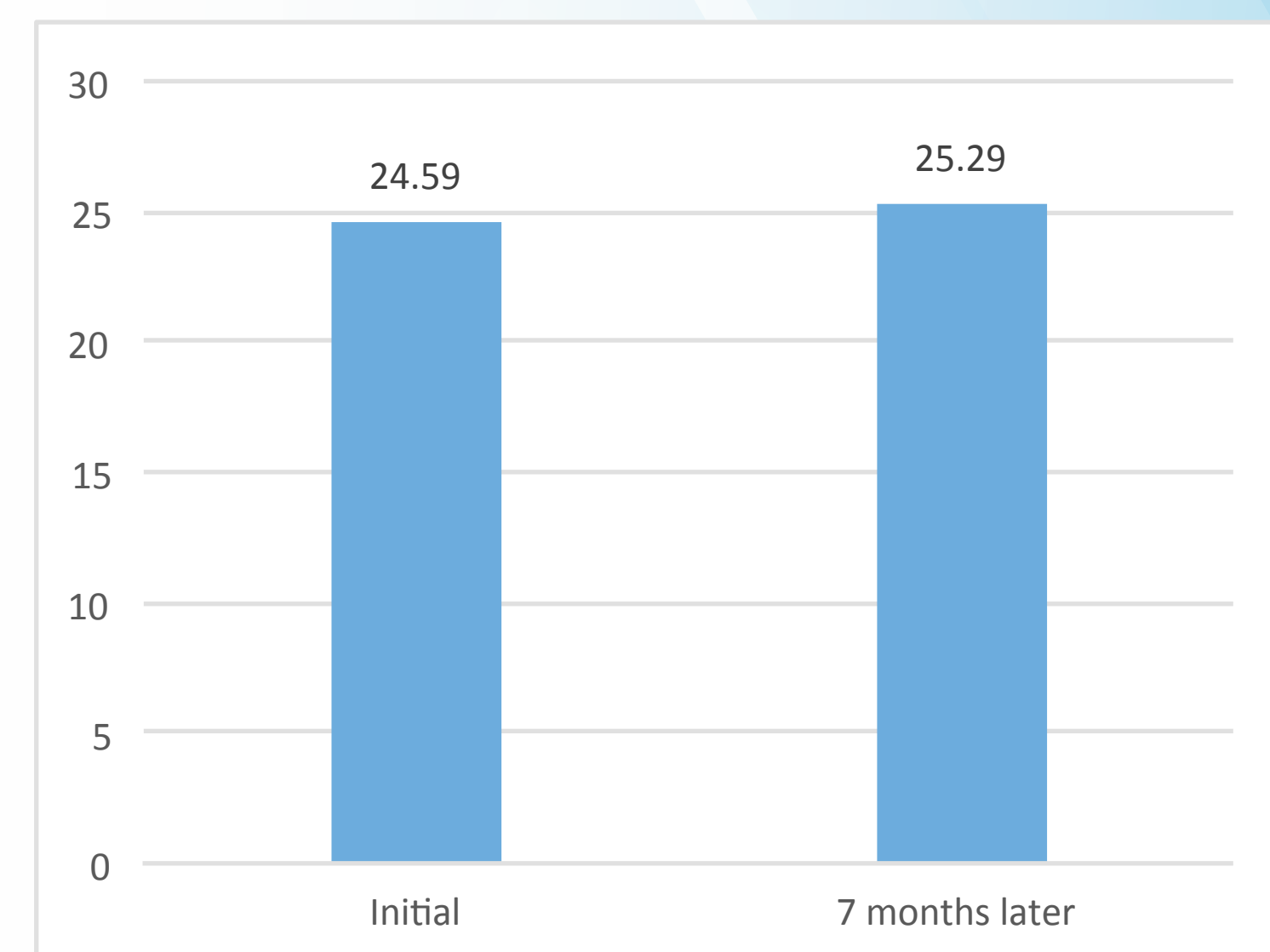


Figure 2. Body mass index at the beginning and after rehabilitation period.

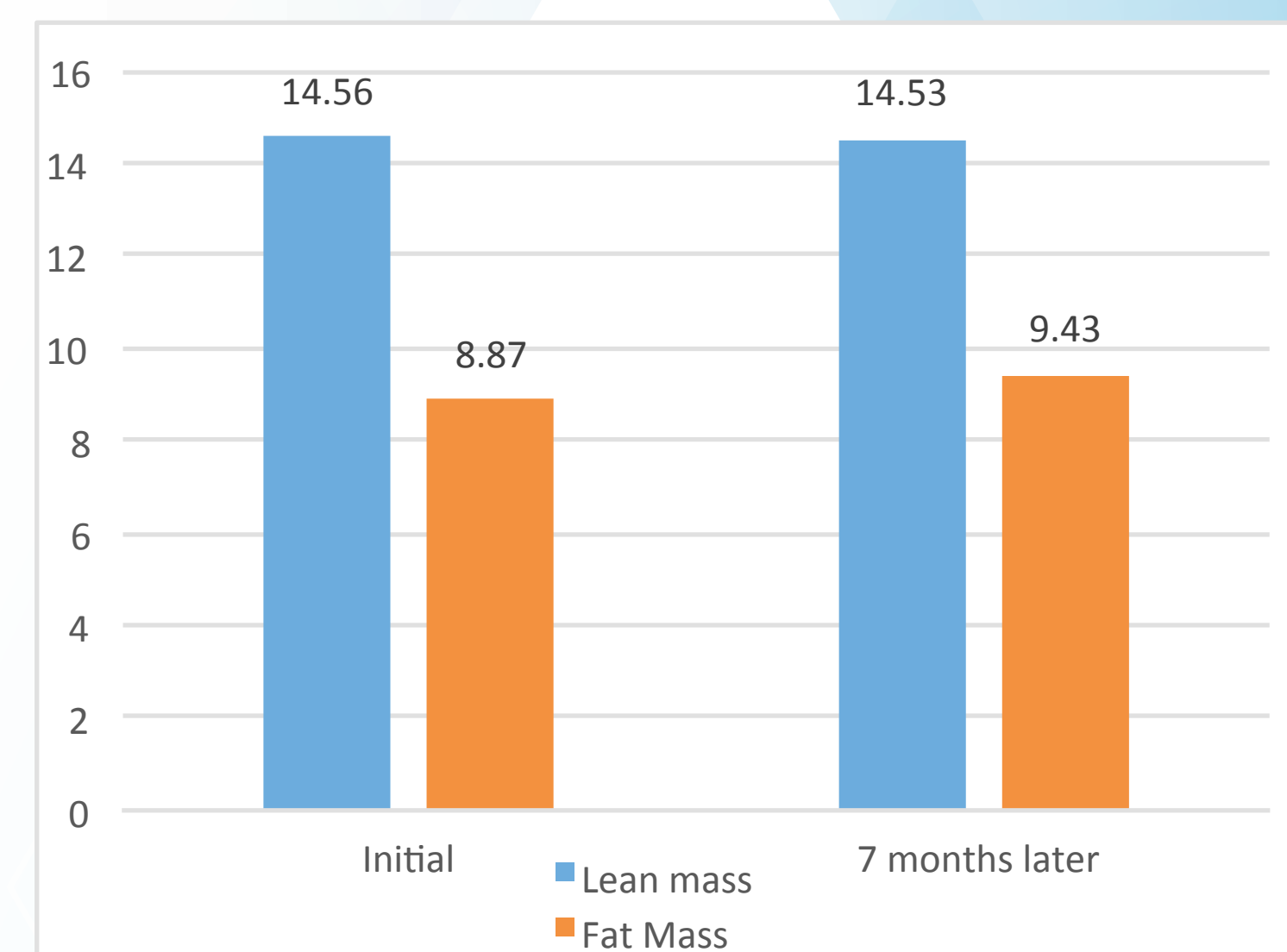


Figure 3. Lean and fat mass at the beginning and after rehabilitation period.

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