# Relationship of Hypovitaminosis D and Hypoandrogenism to Spine Fractures in Males

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## Introduction

- The National Health and Nutrition Examination Survey 2005 to 2006 data were analyzed for vitamin D levels in adult participants.
- The overall prevalence of vitamin D deficiency is 41.6%.
- Vitamin D plays an essential role in bone formation, maintenance, and remodeling.
- Trials have shown that males with testosterone deficiency sustain spine fractures more frequently.
- No research to date has investigated the incidence of hypovitaminosis D in patients 18-60 who have sustained a spine fracture.
- Vertebral body fractures secondary to a known trauma can have debilitating long term effects on spine stability.

## Methods

- This retrospective study reviewed the vitamin D and/or testosterone levels of 227 patients presenting to a level 1 trauma center after a trauma related vertebral body fracture from January 2012 to December 2015.
- Study variables included age, spine fracture location, spine fracture type
- Normal testosterone and vitamin D were determined to be 9-38nmol/L and 20-50ng/mL respectively

Exclusion criteria:

- Patients with an unknown etiology
- Patients with non-VB spine fractures
- Patients with unavailable lab values
- Patients of the female sex

Inclusion criteria:

- Patients ages 18-60 of the male sex
- Known history of recent spine trauma

## Results

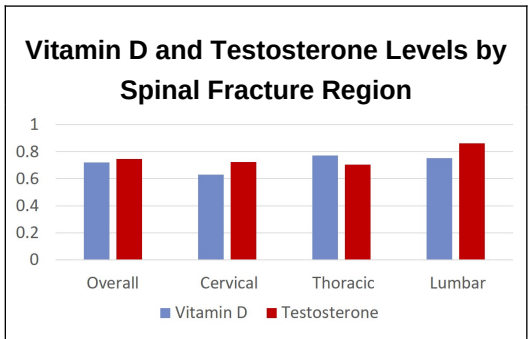
- 221 patients met inclusion criteria
- Overall incidence of hypovitaminosis D and low testosterone is 72.0% and 74.7% respectively

**Vitamin D and Testosterone Deficiency Stratified by Age**

| | 18-30 | 31-45 | 46-60 | |
|---|---|---|---|---|
| Vitamin D | 50/62 (80.7%) | 54/73 (74.0%) | 62/92 (67.4%) | p=0.19 |
| Testosterone | 32/46 (69.6%) | 43/56 (76.8%) | 49/64 (76.6%) | p=0.64 |

## Conclusion

- There is a statistically significant correlation between hypovitaminosis D and low testosterone respectively, and traumatic spine fracture.
- These correlations exist across the board with no statistically significant preference for age group or vertebral column region.
- The results of this investigation warrant a larger scale study to determine statistical significance in the setting of obvious clinical significance.




Vitamin D and Testosterone Levels by Spinal Fracture Region

## Discussion

By identifying risk factors and populations at risk for developing traumatic fractures, an effort may be made to decrease the incidence of such injuries with relatively low -cost preventative measures.

The results of this investigation are unable to support or refute the routine use of vitamin D or testosterone supplementation in any of the assessed populations given the absence of statistical significance. However, the routine health benefits of adequate vitamin D have clearly been outlined elsewhere in the literature. A larger scale investigation is warranted.

## Learning Objectives

Participates should be able to:
1) Identify spine fracture patients that are likely to be low in vitamin D and/or testosterone
2) Identify an additional metabolic risk factor for the development of spine fractures in male patients
3) Recognize age associations with metabolic deficiencies related to vitamin D and testosterone as it relates to male patients with traumatic spine fractures