J Musculoskelet Neuronal Interact. 2021; 21(2): 255–262.

PMCID: PMC8185259

PMID: 34059570

Could vagus nerve stimulation influence bone remodeling?

Ahmad Tamimi,[1] Faleh Tamimi,[2,3] Malik Juweid,[4] Abdelkarim A. Al-Qudah,[5] Amira Al Masri,[5] Said Dahbour,[6] Yakub Al Bahou,[6] Abdelatif Shareef,[4] and Iskandar Tamimi[7]

Author information Article notes Copyright and License information Disclaimer

Abstract

Objectives:

To investigate the effect of vagus nerve stimulation (VNS) on the bone mineral density (BMD) in epileptic patients.

Methods:

A prospective cohort study was conducted on individuals with refractory seizures who underwent VNS surgery between January 2012 and December

2018. BMD was measured preoperatively and between 6 months and one year after surgery.

Results:

Twenty-one patients (mean age (±SD)=23.6±12.3 years) were recruited for the implantation of a VNS device. The mean absolute increase in lumbar BMD in the 21 patients was 0.04±0.04 g/cm2 resulting in an overall percent increase from baseline of 4.7±6.1%. BMD increased by an amount ≥ the least significant change (LSC) for the lumbar spine in 13 patients (61.9%). The lumbar Z score also increased in these patients from -1.22±1.15 to -0.88±1.22, P=0.006). Pre and Post VNA femoral BMD was measured in only 11 patients and, of those 3 showed a significant increase in BMD, 1 a significant decrease and 7 no change.

Conclusion:

The implantation of a VNS was associated with an increase in lumbar BMD. This study could lead to a new application for VNS in the treatment of osteoporosis.