

Vitamin D Deficiency in Emergency Department Patients with Generalized Complaints

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Introduction

- Vitamin D Deficiency (VDD) has been proven to play an underlying role in multiple known disease states with symptoms ranging from fatigue and weakness to depression and cognitive impairment.
- In Emergency Department (ED) patients presenting with generalized, non-specific complaints/symptoms, vitamin D levels are not regularly evaluated.

Objectives

- This study sought to determine if VDD is associated with measures of anxiety, depression, and fatigue as well as ED utilization in ED patients with generalized chief complaints.

Materials and Methods

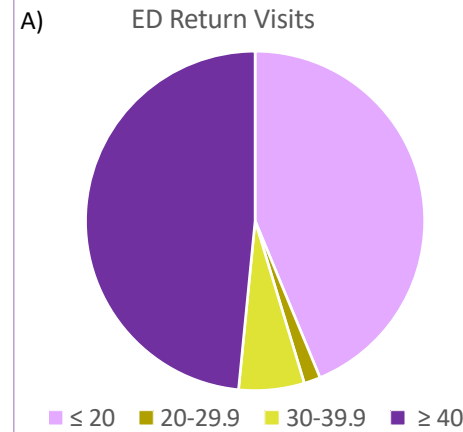
- A cross-sectional observational study was performed in an academic ED of a rural Level 1 trauma center.
- A convenience sample of 100 ED patients presenting with generalized complaints was enrolled over 12 months.
- Patients were excluded if they were <18 years, had a physical injury, life threatening condition, or a medical history of mental illness.
- National Institutes of Health Patient Reported Outcomes Measurement Information System (NIH-PROMIS) scale surveys were used to assess for depression, anxiety, and fatigue.
- Blood was collected and 25-hydroxy-vitamin D₃ levels measured using targeted mass spectrometry (VDD defined as vitamin d <40 ng/ml).
- Chi-square analysis (GraphPad Prism v9.2) determined associations between VDD and positive screenings and unpaired t-test compared number of repeat ED visits across groups.

Results

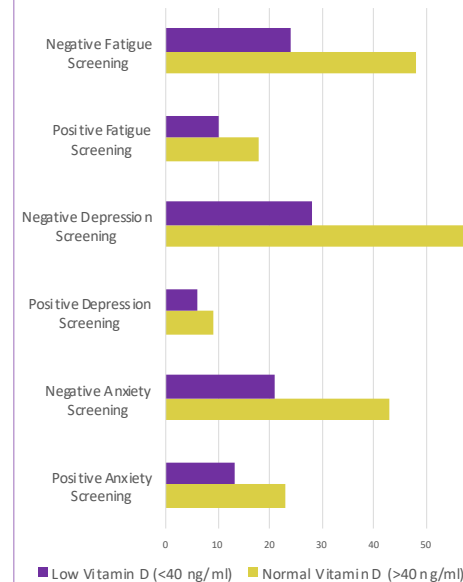
- Vitamin D deficiency and positive NIH-PROMIS screenings-** 34% of patients were vitamin D deficient and accounted for 13% of positive screenings for anxiety, 9% for fatigue and 5% for depression.
- There was no association between VDD and positive screening on the PROMIS measures (p>0.05)
- Vitamin D deficiency and repeat ED visits:** The average number of return visits for VDD patients was 3.2 +/- 0.77 vs. 2.0 +/- 0.32 for non-VDD patients (p=0.09).
- Seven patients with the most severe VDD (<20 ng/mL) represented 85% of the return visits by VDD patients.
- Only 23% who did not return to the ED had vitamin d <20 ng/ml (p=0.15; OR = 3.3; 95% CI = 0.8-12.0)
- Post-hoc analysis shows this study is powered at 61%. 52 patients in each group are needed to reach significance for an association between VDD and return ED visits.

Vitamin D Deficiency and Return ED Visits within 12 months

Return ED Visit?	≤ 20	20-29.9	30-39.9	≥ 40
Yes	7	1	3	22
No	8	7	8	44
Total Number of Return Visits	28	1	4	31



B) NIH-PROMIS Scale Survey Results



A) Number of return ED visits and patient vitamin d levels.

B) NIH-PROMIS survey results in patients with low and normal vitamin d levels.

Discussion

- No association was found between VDD and measures of fatigue, depression or anxiety in ED patients.
- The number of repeat visits from VDD patients (32 visits from 11 patients) was greater than that of non-deficient patients (31 visits from 22 patients).
- Future studies with a larger enrollment may focus on the use of severely low (<20 ng/ml) levels of vitamin d to predict outcomes.

Conclusion

- The original objective of this study was not achieved, however potential avenues for future analysis have been uncovered.
- The use of Vitamin D both as a diagnostic tool and treatment could reduce the number of return visits in patients with generalized, non-specific complaints
- If future studies were to reveal this association this could help treat patients' symptoms and reduce unnecessary usage of ED resources.

Acknowledgements

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