

## Low Vitamin D Levels Are Associated with Higher Opioid Dose in Palliative Cancer Patients – Results from an Observational Study in Sweden

**Reference:** Peter Bergman<sup>1</sup>, Susanne Sperner<sup>2</sup>, Jonas Höijer<sup>3</sup>, Jenny Bergqvist<sup>2,4</sup>, Linda BjörkhemBergman<sup>1,2\*</sup>

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### Abstract

**Background:** Vitamin D deficiency is common among palliative cancer patients and has been connected to an increased risk for pain, depressions and infections. Therefore we wanted to test the hypothesis that low 25-hydroxyvitamin D (25OHD) levels are associated with higher opioid dose, higher infectious burden and impaired quality of life in palliative cancer patients. The secondary aim was to investigate the association between 25OHD-levels and survival time.

**Method:** In this prospective, observational study in palliative cancer-patients (n = 100) we performed univariate and multiple linear regression analysis to assess the association of 25OHD levels with opioid dose, infectious burden (antibiotic consumption), quality of life (Edmonton Symptom Assessment Scale, ESAS) and survival time, controlling for potential confounding factors.

**Results:** The median 25OHD level was 40 nmol/L (range 8-154 nmol/L). There was a significant association between 25OHD levels and opioid dose, beta coefficient -0.67; p=0.02; i.e. a low 25OHD level was associated with a higher opioid dose. This association remained significant after adjustment for stage of the cancer disease in a multivariate analysis, beta coefficient -0.66; p = 0.04. There was no association between 25OHD levels and antibiotic use or quality of life. Univariate cox regression analysis showed a weak correlation between survival time and 25OHD levels (p < 0.05). However decreased albumin levels and increased CRP levels were superior markers to predict survival time; p<0.001 for both analyses.

**Conclusion** Low 25OHD-levels are associated with increased opioid consumption in palliative cancer patients. Future interventional studies are needed to investigate if pain can be reduced by vitamin D supplementation in these patients. In addition, this study confirms previous findings that low albumin and increased CRP levels are useful markers for survival time in palliative cancer patients.

### Strengths of study

The study is prospective design and does not appear to have industry funding.

### Weaknesses of study

Despite the authors' contention to the contrary, the study population was not well defined and the methodology, as described, appeared incomplete. Opioids used, doses and adjuvant medications were not defined. The use of supplementation was not described or commented on, nor were pertinent labs.

As the study is observational, no causality can be inferred.

### Relevance to palliative care

This is a pilot study to determine if Vitamin D levels are associated with decreased opioid use. Although the results are inconclusive, it may be worthwhile to follow subsequent studies as the authors try to determine if low 25OHD levels are associated with increased opioid use and if supplementation with Vitamin D may decrease opioid doses.