



Vitamin D serum levels and association with musculoskeletal symptoms in patients with Chikungunya fever: a possible biomarker?

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BACKGROUND

Chikungunya (CF) fever is a viral disease transmitted to humans by the *Aedes aegypti* mosquito, infected by the Chikungunya virus (CHIKV), causing disabling musculoskeletal symptoms. Some studies have associated levels of vitamin D with musculoskeletal symptoms, although this relationship has not yet been studied in CF. The aim of the present study was to analyze vitamin D levels and their possible association with debilitating musculoskeletal symptoms.

MATERIALS AND METHODS

Data were extracted from a cohort study that included 78 patients diagnosed with CF, with a follow-up of 3 years (2016-2019). For analyzes we divided the patients into groups: vitamin D levels below 30ng/ml (low-level group) and equal or above 30ng/ml (normal-level group). Laboratory and clinical data were collected in 3 quarterly visits.

RESULTS

In the first trimester after chikungunya onset, we analyzed 33 patients. Values of HAQ were higher in patients with low vitamin D levels compared to normal-level group [2.500 (IQR:1.625-2.873) vs. 1.563 (IQR:1.063-2.469); $p=0.0281$]. There was a negative correlation ($p=0.0169$; $r=-0.4192$) between vitamin D levels and visual analogic scale (VAS) score for fatigue in this period.

In second trimester, in which 45 patients were evaluated, number of swollen joints was higher in patients with low serum vitamin D [1(IQR:0-6) vs. 0(IQR:0-0); $p=0.0170$]. Also, in this period, there was a negative correlation of vitamin D levels with number of swollen joints ($p=0.0091$, $r=-0.3843$) and with VAS score for pain ($p=0.0271$, $r=-0.3476$).

In the third trimester, 44 patients were analyzed. Patients with low levels had higher VAS scores for morning stiffness [3.700 (IQR:1.050-8.450) vs. 1.250 (IQR:0-4.075); $p=0.0165$]. There was a negative correlation ($p=0.0208$; $r=-0.3476$) between vitamin D levels and morning stiffness EVA score.

Twenty-seven patients were analyzed in first trimester and were compared to their own clinical parameters in third trimester. Both groups improved in several clinical parameters. Of note, the low-level group ($n=16$) improved in VAS score for fatigue and Erythrocyte sedimentation rate whereas the normal-level group ($n=11$) did not improve in these parameters. However, this improvement was associated with

increase in serum levels of vitamin D in patients in low-level group, and it did not occur in the normal-level group. This must have happened mainly to vitamin D supplementation during the follow-up.

CONCLUSION

Low levels of vitamin D may be associated with worse clinical musculoskeletal symptoms in patients affected by Chikungunya Fever. This study suggests that vitamin D might be used as a biomarker of disease severity in the disease.