Reviewer's report

Title: Low Vitamin D Level Was Associated With Metabolic Syndrome And High Leptin Level In Subjects With Nonalcoholic Fatty Liver Disease: A Community-based Study

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Reviewer: Anam Khan

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In this cross-sectional study, Chen and colleagues examine the association of serum vitamin D levels and risk of metabolic syndrome and hepatic steatosis severity.

The manuscript has a few limitations. The authors use abdominal ultrasound to determine the severity of hepatic steatosis. On page 12, line 206-208, the authors state "The degree of fatty liver disease was graded as normal (absent), mild, moderate or severe, on the basis of the intense reflection level of echogenicity". Liver biopsy is currently the most reliable approach for identifying for the presence of steatohepatitis and fibrosis in patients with NAFLD. Imaging tests such as ultrasound do not reliably reflect the spectrum of liver histology in patients with NAFLD. Imaging such as with magnetic resonance elastography or transient elastography are validated noninvasive imaging modalities for assessment of advanced fibrosis in patients with NAFLD which were not used by the study authors.

The authors do calculate the NAFLD fibrosis score which is a validated clinical decision aid to predict likelihood of advanced fibrosis. However according to the authors, most subjects with NAFLD did not have an advanced fibrosis status. On page 13, line 281, the authors state "77% of subjects present a NAFLD fibrosis score <1.455, indicating a low degree of fibrosis (F0-2). Only 6 subjects with a NAFLD fibrosis score >0.674 (high degree of fibrosis, F3-4) were identified in this study". Hence, the authors could not draw any conclusions regarding an association between vitamin D levels and fibrosis in subjects with NAFLD.

Hence, this reviewer recommends that the association of vitamin D with severity of NAFLD be removed from the primary aim if using abdominal ultrasound alone to determine severity of NAFLD. The primary aim should be limited to determine the association of vitamin D with NAFLD.
The authors have mentioned that one of the strengths of their study was that they measured the serum levels of inflammatory cytokines e.g. adiponectin, leptin, CRP and TNF-alpha. The secondary aim of the study should be explicitly stated to reflect that the association between serum vitamin D levels and levels of adiponectin, leptin, CRP and TNF-alpha was to be determined.

Overall, the authors have done a good job of demonstrating that serum vitamin D levels are associated with metabolic syndrome independently of confounders such as obesity and NAFLD status.

The authors should include that one of the limitations of their study was the inclusion of a majority of patients with NAFLD without advanced fibrosis based on NAFLD fibrosis scores. This could explain why no association was found between serum vitamin D levels and NAFLD.

Are the methods appropriate and well described?  
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?  
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?  
If not, please explain in your comments to the authors.

No

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