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LETTER TO THE EDITOR Open Access

A critical evaluation of berberine in NAFLD management: recommendations for improved research methodology

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Dear editor,

I was intrigued by the study conducted by Qilong and colleagues, which underscores the efficacy of berberine in improving liver enzymes, lipid profiles, and insulin sensitivity in patients with non-alcoholic fatty liver disease (NAFLD) [1]. This research contributes significantly to the understanding of NAFLD; however, we believe there are critical areas related to study design, methodology, and outcome assessment that could be refined to foster a more comprehensive understanding of this multifaceted disease.

Firstly, the evaluation of NAFLD should incorporate a wider array of biomarkers and clinical parameters. Fasting insulin levels are essential for assessing insulin resistance, a pivotal factor in the pathogenesis of NAFLD. Studies have shown that insulin resistance is one of the most common metabolic abnormalities in NAFLD patients. Therefore, regular monitoring of insulin levels could provide valuable insights for clinical interventions. Furthermore, including assessments such as fasting blood glucose and oral glucose tolerance tests is essential for identifying risks associated with metabolic syndrome, which is closely linked to NAFLD. In terms of imaging evaluations, abdominal ultrasound serves as a non-invasive, practical method for assessing hepatic fat accumulation and providing preliminary diagnoses of fatty liver. Additionally, a more comprehensive approach to liver function tests is warranted; besides the standard transaminases (ALT and AST), including alkaline phosphatase (ALP) and total bilirubin (TBIL) can yield crucial information regarding liver health and help clinicians assess the severity of liver injury [2, 3].

Moreover, serum biomarkers such as C-reactive protein (CRP) are valuable indicators of inflammation. Elevated CRP levels often signify systemic inflammation, a significant contributor to NAFLD progression [4]. Utilizing advanced techniques like FibroScan can assess liver stiffness, providing important data on liver fibrosis and facilitating more informed prognostic and treatment decisions. Additionally, measuring various types of serum fatty acids can deepen our understanding of lipid metabolism in NAFLD, thus guiding the development of personalized dietary strategies aimed at improving patients' metabolic profiles [5].

Regarding participant characteristics, we recommend that the authors provide more comprehensive data, including age, sex, underlying comorbidities, and the specific classification of NAFLD. Such details will enhance the understanding of the study population and how these variables might influence the applicability and limitations of the results. For example, metabolic characteristics may vary significantly across different age groups and genders, potentially affecting disease trajectory and treatment responses.

In describing the intervention, it is vital to specify the exact dosage of berberine, the route of administration,

See the article "The clinical efficacy and safety of berberine in the treatment of non-alcoholic fatty liver disease: a meta-analysis and systematic review" in volume 22, 225.

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and the duration of treatment. These details are critical for assessing the comparability of intervention effects and for ensuring that other researchers can replicate or build upon the study findings effectively. The impact of different routes of administration on the bioavailability of berberine could also be significant, affecting its therapeutic efficacy.

Furthermore, ensuring consistency in treatments between the control and experimental groups is crucial for maintaining the integrity of the research. The treatments administered to the control group should be aligned closely with those given to the experimental group to exclude potential confounding variables. Clarity regarding the methodologies used for measuring outcome indicators, including specific time points and evaluation criteria, is essential for ensuring the reproducibility of the results.

Lastly, in the context of conducting meta-analyses, employing standardized measurement methods and clearly defined time points is fundamental for ensuring comparability of outcomes across studies. We suggest that the authors include additional information regarding the time frame for study inclusion and the criteria for assessing the quality of the research design, including the tools used for quality evaluation. This will significantly bolster the study's rigor and validity, making its findings more applicable in both clinical practice and academic research.

In conclusion, while the study provides valuable insights into the efficacy of berberine in managing NAFLD, it is imperative to adopt a broader assessment framework and enhance methodological transparency to enrich the findings. By incorporating a wider range of biomarkers and clinical parameters, as well as detailing participant characteristics and intervention protocols, future research can achieve a more comprehensive understanding of NAFLD. Such improvements not only strengthen the validity of the findings but also facilitate the development of tailored therapeutic strategies, ultimately contributing to enhanced patient care and outcomes in the management of this complex condition.

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Author contributions
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Data availability
Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
Not applicable.

Author disclosure
The author is currently the Chief Physician of the First Affiliated Hospital of Gannan Medical University and a visiting scholar at Weill Cornell Medical College, USA.

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