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LETTER

Critical Appraisal and Future Directions for the Association Between Albumin Levels and Neonatal Acute Respiratory Distress Syndrome in Newborn Pneumoniae [Letter]

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Dear editor

We have reading the article by Yu et al on the association between albumin levels and neonatal acute respiratory distress syndrome in newborn pneumonia.[1] The authors present a valuable contribution to the field by investigating the relationship between serum albumin levels and the incidence of neonatal acute respiratory distress syndrome (NARDS) in neonates with pneumonia. The use of multivariable logistic regression and propensity score matching to adjust for potential confounding factors strengthens the conclusions drawn. The identification of hypoalbuminemia as an independent risk factor for NARDS in neonatal pneumonia patients is indeed noteworthy. The linear dose-response relationship observed between albumin levels and NARDS risk provides important quantitative data for clinicians. However, some critical insights suggest directions for future research in this area.

Firstly, the study focuses solely on the association between albumin levels and NARDS, neglecting potential underlying mechanisms. A deeper understanding of the biological pathways linking hypoalbuminemia to respiratory distress is crucial. The proposed role of hypoxia-inducible factor-1 (HIF-1) in orchestrating both the metabolic shift towards glycolysis and the initiation of the coagulation cascade, offers a promising avenue for investigation.[2] Future research should explore the roles of inflammation, oxidative stress, and surfactant dysfunction in this context. Experimental studies in animal models could provide mechanistic insights that are difficult to obtain in human subjects.

Secondly, the study lacks comprehensive information on clinical outcomes and the specific impact of albumin levels on the prognosis of NARDS. While the existing research[3] has established a strong association between early onset hypoalbuminemia (EOH) and the development of ARDS in trauma patients, it is imperative to further investigate whether maintaining optimal albumin levels can lead to improved clinical outcomes. The findings from the literature, specifically the study on hypoalbuminemia in trauma patients, highlight the significant influence of EOH on ARDS incidence and 28-day mortality.[3] Patients with EOH had 8.2 times greater odds of developing ARDS and a 7.7 times higher risk of 28-day all-cause death compared to those with normal albumin levels. These striking associations underscore the potential clinical benefits of maintaining adequate albumin levels in at-risk patients. To address these critical questions, longitudinal follow-up studies are urgently needed, including the duration and intensity of mechanical ventilation, length of hospital stay, and long-term survival rates.

Furthermore, the study overlooks the crucial aspect of nutritional status and the profound influence that both enteral and parenteral nutrition exert on serum albumin levels. It is well-documented that malnutrition is widespread among critically ill neonates, posing a significant impediment to albumin synthesis.[4] To improve future research, include

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comprehensive nutritional assessments and interventions to understand how nutrition affects albumin levels and reduces NARDS risk.

Finally, the study highlights the importance of routine assessment of serum albumin levels in neonates with pneumonia. However, it does not propose specific guidelines or thresholds for clinical action. Developing evidence-based guidelines for albumin supplementation or other interventions based on serum albumin levels could significantly impact clinical practice.[5] Collaborative efforts among clinicians, researchers, and policymakers are needed to translate these research findings into actionable recommendations.

Disclosure

All the authors declare that they have no conflict of interest in this communication.

References

1. Yu A, Hou H, Shi D, et al. Association between albumin levels and neonatal acute respiratory distress syndrome in newborn pneumoniae. *J Inflamm Res*. 2024;17:10015–10026. doi:10.2147/JIR.S492404
2. Ambade V, Ambade S. SARS-CoV-2 infecting endothelial cells, biochemical alterations, autopsy findings and outcomes in COVID-19, suggest role of hypoxia-inducible factor-1. *J Med Biochem*. 2022;41(1):14–20. PMID: 35291496; PMCID: PMC8882013. doi:10.5937/jomb0-30659
3. Kumar M, Jain K, Chauhan R, et al. Hypoalbuminemia: incidence and its impact on acute respiratory distress syndrome and 28-day outcome in trauma patients. *Eur J Trauma Emerg Surg*. 2023;49(5):2305–2314. PMID: 37402792. doi:10.1007/s00068-023-02318-5
4. Newcombe J, Fry-Bowers E. A post-operative feeding protocol to improve outcomes for neonates with critical congenital heart disease. *J Pediatr Nurs*. 2017;35:139–143. PMID: 28063770. doi:10.1016/j.pedn.2016.12.010
5. Abedi F, Zarei B, Elyasi S. Albumin: a comprehensive review and practical guideline for clinical use. *Eur J Clin Pharmacol*. 2024;80(8):1151–1169. PMID: 38607390. doi:10.1007/s00228-024-03664-y

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