Exploring the Relationship Between White Blood Cell Count and Early Hematoma Expansion in Spontaneous Intracerebral Hemorrhage

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DESCRIPTION

Spontaneous Intracerebral Hemorrhage (ICH) is a devastating form of stroke with high morbidity and mortality rates. Early hematoma growth within the first hours after onset is a critical determinant of patient outcomes. This study aimed to investigate the association between White Blood Cell (WBC) count and ultra-early hematoma growth in patients with spontaneous ICH. We conducted a retrospective analysis of patients admitted with spontaneous ICH within 6 hours of symptom onset. Clinical data including initial WBC count and baseline hematoma volume were collected. Ultra-early hematoma growth was defined as an increase in hematoma volume of ≥ 6 mL within the first 6 hours. Univariate and multivariate analyses were performed to assess the association between WBC count and ultra-early hematoma growth, adjusting for potential confounders.

A total of patients were included in the analysis. Our results demonstrated a significant association between elevated WBC count on admission and ultra-early hematoma growth (Odds Ratio (OR) 95% Confidence Interval (CI), p<0.05). After adjusting for confounding factors including age, sex, baseline hematoma volume, and comorbidities, elevated WBC count remained independently associated with ultra-early hematoma growth (adjusted OR [95% CI], p<0.05). Subgroup analysis revealed that this association was consistent across different demographic and clinical subgroups. In conclusion, elevated WBC count on admission is independently associated with ultra-early hematoma growth in patients with spontaneous ICH. Further prospective studies are warranted to elucidate the underlying mechanisms and explore the potential implications for therapeutic interventions.

Spontaneous Intracerebral Hemorrhage (ICH) is a devastating subtype of stroke characterized by bleeding into the brain parenchyma, resulting in high morbidity and mortality rates [1]. Early hematoma growth within the first few hours after onset has been identified as a critical determinant of poor outcomes in patients with spontaneous ICH [2]. Despite advances in medical management, effective strategies to prevent or mitigate hematoma expansion remain elusive [3]. Therefore, there is an urgent need to identify reliable biomarkers and therapeutic targets for early intervention in patients at risk of hematoma growth.

White Blood Cells (WBCs) play a important role in the pathophysiology of various inflammatory and thrombotic disorders, including stroke [4]. Previous studies have suggested that systemic inflammation, as evidenced by elevated WBC count, may contribute to the development and progression of ICH-related brain injury [5]. However, the association between WBC count and ultra-early hematoma growth in patients with spontaneous ICH remains poorly understood.

This retrospective cohort study included patients admitted with spontaneous ICH within 6 hours of symptom. Clinical data, including demographics, medical history, laboratory results, radiological findings, and outcomes, were retrieved from electronic medical records. The primary exposure of interest was the initial WBC count on admission. The primary outcome was ultra-early hematoma growth, defined as an increase in hematoma volume of ≥ 6 mL within the first 6 hours of admission.

In this retrospective cohort study, we found a significant association between elevated WBC count on admission and ultra-early hematoma growth in patients with spontaneous ICH. These findings suggest a potential role of systemic inflammation in the pathogenesis of hematoma expansion in ICH. Previous studies have demonstrated that inflammatory mediators released in response to acute brain injury can lead to disruption of the blood-brain barrier and exacerbate secondary brain injury processes. Our study adds to the growing body of evidence supporting the involvement of inflammation in the pathophysiology of hematoma growth in ICH. However, further prospective studies are warranted to elucidate the underlying mechanisms and explore the therapeutic implications of targeting inflammation in mitigating hematoma growth and improving outcomes in patients with spontaneous ICH.

CONCLUSION

Elevated WBC count on admission is independently associated with ultra-early hematoma growth in patients with spontaneous ICH. These findings highlight the potential role of systemic inflammation in the pathogenesis of hematoma expansion in ICH. Further research is needed to validate these findings and explore the therapeutic implications of targeting inflammation in improving outcomes in patients with spontaneous ICH.

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