International Journal of Nursing and Medical Science 2026:15(02), 39-41

IJNMS ISSN: 2454-6674

INTERNATIONAL JOURNAL OF NURSING AND MEDICAL SCIENCE

Nursing Education Health Science Research

PANACEA INTERNATIONAL JOURNAL | PRL PUBLISHER

Original Research Article **Volume 15 Issue 02** **March - April 2026**

ULTRASOUND ASSESSMENT OF HEMODYNAMIC INCOMPETENCE OF THE INTERNAL JUGULAR VEIN VALVE

Ozodova Nargiza Muminjanovna

Assistant, Department of Military Therapy, Hematology and Diagnostic Radiology,

Urganch State Medical Institute, Urganch, Uzbekistan

Introduction: Cerebral venous outflow is a critically important component of brain hemodynamics, and its impairment is considered a significant pathogenetic factor in the development of chronic cerebrovascular dyscirculation. The internal jugular vein (IJV) functions as the main conduit for venous return from the cranial cavity. Its valvular apparatus provides an anti-reflux mechanism, preventing retrograde transmission of intrathoracic pressure in the cranial direction. Valvular incompetence leads to pathological retrograde blood flow, venous hypertension, and microcirculatory disturbances, contributing to the development of venous encephalopathy and cognitive dysfunction.

Keywords: Internal jugular vein, venous insufficiency, duplex ultrasonography, venous reflux, cerebral hemodynamics, Doppler

Objective: To perform a comprehensive morphofunctional and hemodynamic assessment of the internal jugular vein valvular apparatus using modern ultrasonographic techniques, to identify diagnostically significant criteria of valvular incompetence, and to evaluate their clinical relevance.

Materials and Methods: The study was conducted using high-resolution duplex ultrasonography, including B-mode imaging, color and power Doppler mapping, and spectral flow analysis. Examinations were performed at rest and under functional loading (Valsalva maneuver and respiratory maneuvers), allowing the detection of both overt and latent forms of valvular dysfunction. Morphometric parameters (venous diameter, thickness and mobility of valvular leaflets), venous compliance, linear blood flow velocity, flow phasing, direction, and turbulence were assessed.

Results: Valvular incompetence of the IJV was characterized by dilation of the venous lumen, incomplete coaptation of valve leaflets, and reduced elastico-tonic properties of the venous wall. The primary ultrasonographic marker was retrograde blood flow lasting >0.5 seconds under functional loading. Doppler analysis revealed decreased antegrade flow velocity, disorganization of flow phasing, loss of synchronization with respiratory and cardiac cycles, and the presence of turbulent flow, indicating pronounced hemodynamic instability.

Conclusions: Valvular incompetence of the internal jugular vein represents a key pathophysiological mechanism underlying impaired venous outflow and the formation of chronic venous dyscirculation. Duplex ultrasonography demonstrates high sensitivity and specificity in detecting anatomical and functional signs of valvular dysfunction,

enabling timely diagnosis and optimization of patient management in cases of cerebral hemodynamic impairment.

References

1. Aytimova G.Y., Alimboyeva S.H., Nodirbekova M.U. Importance of ultrasound examination in valvular insufficiency of the internal jugular veins. Ta'lim innovatsiyasi va integratsiyasi. 2025.
2. Moschovaki N., Spiliotaki E., Brozou V. et al. Point-of-care internal jugular vein ultrasound for perioperative hemodynamic assessment: a critical review. J Clin Ultrasound. 2026;54(2):415–426.