Prothrombin time

The prothrombin time (PT)—along with its derived measures of prothrombin ratio (PR) and international normalized ratio (INR)—are assayed evaluating the extrinsic pathway of coagulation. This test is also called “ProTime INR” and “PT/INR”. They are used to determine the clotting tendency of blood, in the measure of warfarin dosage, liver damage, and vitamin K status. PT measures factors I (Fibrinogen), II (Prothrombin), V (Proaccelerin), VII (Proconvertin), and X (Stuart–Prower Factor). It is used in conjunction with the activated partial thromboplastin time (aPTT) which measures the intrinsic pathway and common pathway.

For procedures where post-op mass effect from bleeding would pose a serious risk (which includes most neurosurgical operations), it is recommended that the PT should be ≈ ≤ 13.5 sec (i.e., ≤ upper limits of normal) or the INR should be ≈ ≤ 1.4 (e.g., for reference, this INR is considered safe for performing a percutaneous needle liver biopsy).

Postoperative delayed hyponatremia is a major cause of readmission after endoscopic transsphenoidal surgery (eTSS) for pituitary adenomas (PAs). However, the risk factors associated with PDH have not been well established, and the development of a dynamic online nomogram for predicting PDH is yet to be realized. Cai et al. aimed to investigate the predictive factors for PDH and construct a dynamic online nomogram to aid in its prediction.

They analyzed the data of 226 consecutive patients who underwent eTSS for PAs at the Department of Neurosurgery in Jinling Hospital between January 2018 and October 2020. An additional 97 external patients were included for external validation. PDH was defined as a serum sodium level below 137 mmol/L, occurring on the third postoperative day (POD) or later.

Hyponatremia on POD 1-2 (OR = 2.64, P = 0.033), prothrombin time (PT) (OR = 1.78, P = 0.008), and percentage of monocytes (OR = 1.22, P = 0.047) were identified as predictive factors for PDH via multivariable logistic regression analysis. Based on these predictors, a nomogram was constructed with great discrimination in internal validation (adjusted AUC: 0.613-0.688) and external validation (AUC: 0.594-0.617). Furthermore, the nomogram demonstrated good performance in calibration plot, Brier Score, and decision curve analysis. Subgroup analysis revealed robust predictive performance in patients with various clinical subtypes and mild to moderate PDH.

Preoperative PT and the percentage of monocytes were, for the first time, identified as predictive factors for PDH. The dynamic nomogram proved to be a valuable tool for predicting PDH after eTSS for PAs and demonstrated good generalizability. Patients could benefit from early identification of PDH and optimized treatment decisions [1)].

1)
Cai X, Zhang A, Zhao P, Liu Z, Aili Y, Zeng X, Geng Y, Du C, Yuan F, Zhu J, Yang J, Tang C, Cong Z, Liu Y, Ma C. Predictors and dynamic online nomogram for postoperative delayed hyponatremia after endoscopic transsphenoidal surgery for pituitary adenomas: a single-center, retrospective, observational cohort study with external validation. Chin Neurosurg J. 2023 Aug 1;9(1):19. doi: 10.1186/s41016-023-00334-3. PMID: 37525288.