Copeptin in Pituitary surgery

Copeptin is a stable surrogate marker of vasopressin release; the peptides are stoichiometrically secreted from the neurohypophysis due to elevated plasma osmolality or nonosmotic stress. We hypothesized that following stress from pituitary surgery, patients with neurohypophyseal damage and eventual diabetes insipidus (DI) would not exhibit the expected pronounced copeptin elevation.

OBJECTIVE: The objective was to evaluate copeptin's accuracy to predict DI following pituitary surgery.

DESIGN: This was a prospective multicenter observational cohort study.

SETTING: Three Swiss or Canadian referral centers were used.

PATIENTS: Consecutive pituitary surgery patients were included.

MEASUREMENTS: Copeptin was measured postoperatively daily until discharge. Logistic regression models and diagnostic performance measures were calculated to assess relationships of postoperative copeptin levels and DI.

RESULTS: Of 205 patients, 50 (24.4%) developed postoperative DI. Post-surgically, median [25th-75th percentile] copeptin levels were significantly lower in patients developing DI vs those not showing this complication: 2.9 [1.9-7.9] pmol/L vs 10.8 [5.2-30.4] pmol/L; P < .001. Logistic regression analysis revealed strong association between postoperative copeptin concentrations and DI even after considering known predisposing factors for DI: adjusted odds ratio (95% confidence interval) 1.41 (1.16-1.73). DI was seen in 22/27 patients with copeptin <2.5 pmol/L (positive predictive value, 81%; specificity, 97%), but only 1/40 with copeptin >30 pmol/L (negative predictive value, 95%; sensitivity, 94%) on postoperative day 1.

LIMITATIONS: Lack of standardized DI diagnostic criteria; postoperative blood samples for copeptin obtained during everyday care vs at fixed time points.

CONCLUSIONS: In patients undergoing pituitary procedures, low copeptin levels despite surgical stress reflect postoperative DI, whereas high levels virtually exclude it. Copeptin therefore may become a novel tool for early goal-directed management of postoperative DI.

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Winzeler B, Zweifel C, Nigro N, Arici B, Bally M, Schuetz P, Blum CA, Kelly C, Berkmann S, Huber A, Gentili F, Zadeh G, Landolt H, Mariani L, Müller B, Christ-Crain M. Postoperative Copeptin Concentration Predicts Diabetes Insipidus After Pituitary Surgery. J Clin Endocrinol Metab. 2015 Jun;100(6):2275-82. doi: 10.1210/jc.2014-4527. Epub 2015 Apr 29. PubMed PMID: 25923040.

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