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Importance of Copeptin in New Biomarker of the Midregion

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INTRODUCTION

The hypothalamic-pituitary-adrenal system is activated in response to stress. One of the hypothalamic activation hormones is arginine vasopressin, a hormone involved in hemodynamic and osmoregulation. Copeptin, the C-terminal portion of the arginine vasopressin precursor peptide, is a sensitive and stable surrogate marker of arginine vasopressin release. Measurement of copeptin levels has proven useful in a variety of clinical scenarios, especially as a prognostic marker for acutely ill patients such as lower respiratory tract infections, heart disease, and stroke.

DESCRIPTION

Measurement of copeptin levels can provide important information for risk stratification in various clinical settings. So the emergency room seems like the ideal place to use them. This review summarizes recent advances in determining the prognostic and diagnostic value of copeptin in the emergency department. Copeptin is an important new mid-range biomarker discovered in recent years. This is a fragment of the vasopressin prohormone prepro vasopressin. Preprovasopressin is divided into copeptin and vasopressin in the posterior pituitary gland. After cleavage of both copeptin and vasopressin, equimolar amounts are released into the circulation and excreted by the kidneys. It is well known that vasopressin is the main cause of hypernatremia. Furthermore, elevated vasopressin levels have been regularly observed in patients with severe heart failure, highlighting the potential of vasopressin as a prognostic biomarker. However, due to its rapid clearance and *in vitro* instability, vasopressin is not widely used in clinical practice. Unlike vasopressin, copeptin is highly stable *in vitro*, making it an ideal surrogate biomarker for vasopressin. In the BACH study, the largest study evaluating copeptin in patients with acute heart failure, elevated copeptin levels were associated with increased mortality, heart failure-related readmissions, and heart failure-related emergency room visits. In addition, copeptin was elevated and mortality was significantly increased in patients with hypernatremia. These results highlight the prognostic utility of copeptin in patients with acute heart failure and open the door to future studies of copeptin-induced therapy with vasopressin antagonists in patients with acute heart failure. Copeptin is a novel blood biomarker for acute ischemic stroke designed to assist physicians in decision making. Serum copeptin may accurately reflect vasopressin concentrations that play a role in exacerbating inflammatory responses, ionic and neurotransmitter dysfunction. The aim of this study was to investigate the relationship between copeptin levels as a blood biomarker and short-term prognosis after 3 months of acute ischemic stroke. The current study included 45 patients with first-ever acute ischemic stroke and 45 healthy subjects as controls. Clinical evaluation, brain CT and MRI, NIHSS on admission and mRS at 3 months were performed on the patients, and all patients and controls underwent assessment of serum levels of copeptin by ELISA technique. Suspected acute myocardial infarction is one of the leading reasons for admission to the emergency department. Over the past decade, biomarkers have revolutionized the treatment of patients with suspected acute coronary syndromes. In addition to their core support in timely diagnosis, biomarkers provide additional information for risk stratification. Cardiac troponin I and T are the most sensitive and specific markers of acute myocardial injury. However, novel biomarker candidates sensitive to early disease stages are being extensively investigated to overcome the remaining limitations of these markers [1-4].

CONCLUSION

Among them, copeptin, a stable peptide derived from the precursor of vasopressin, has emerged as a promising biomarker to assess suspected acute myocardial infarction. In this review, we summarize currently available evidence for the usefulness of copeptin in the diagnosis and risk stratification of patients

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with suspected acute myocardial infarction compared to conventional biomarkers.

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CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.

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