

## Il valore prognostico della copeptina nello scompenso cardiaco

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### RIASSUNTO

Lo Scompenso Cardiaco (SC) è una patologia grave, a volte letale ad elevata incidenza, caratterizzata dall'improvvisa e rapida insorgenza di segni di peggioramento dell'insufficienza cardiaca. Oltre i convenzionali marcatori BNP e NT-proBNP utilizzati per la diagnosi e il monitoraggio dello SC, è stata associata la determinazione della Copeptina (COOP) che sembra svolgere un importante ruolo predittivo di insorgenza di eventi avversi e può essere considerato un marcatore di patologia acuta, in quanto le sue concentrazioni ematiche aumentano in queste situazioni risultando così un indice non specifico di criticità. Il nostro studio ha arruolato prospetticamente 53 pazienti afferenti presso l'AORN "Monaldi" di Napoli, tra Giugno 2021 e Settembre 2022. L'età media dei pazienti in esame era pari a  $68 \pm 3,5$  anni di cui 40 maschi e 13 femmine. Tutti sono stati sottoposti a un prelievo ematico alla comparsa di un evento acuto (T0) per valutare i seguenti marcatori: COOP, BNP, NT-proBNP. Dei 26 pazienti in cui il valore della COOP era elevato al T0, 9 hanno sviluppato un evento avverso di vario grado e natura nei 3 mesi di follow up (T1), rispetto a 1 paziente con valore più basso di COOP al T0. È quindi risultato evidente che i pazienti che mostravano valori più elevati di COOP al T0, presentavano un maggiore rischio di sviluppare un evento avverso a breve termine, rispetto ai pazienti con valori di COOP al T0 più bassi. Si evince che esiste una correlazione positiva tra le elevate concentrazioni di COOP al T0 e lo sviluppo di eventi cardiovascolari avversi. L'associazione nell'analisi dei valori di COOP e NT-proBNP, potrà arricchire la valutazione del quadro clinico del paziente.

**Parole chiave:** Copeptina; Scompenso Cardiaco; Peptidi Natriuretici; Biomarcatore

### ABSTRACT

**Prognostic value of copeptin in heart failure. Background.** Heart failure is a serious disease, can be fatal with high incidence, affecting about 2% of the population in the Western world, the increase of which is mainly related to progressive aging. Acute Heart Failure (ACS) is characterized by the sudden and rapid onset of signs of heart failure and has long been considered an irreversible disease. However, recent studies have shown that appropriate therapy can halt or partially reverse decompensation, greatly extending patients' life expectancy. The assays of many biochemical markers have been proposed to facilitate clinical practice, both to highlight early signs of heart failure in asymptomatic subjects and to monitor disease progression: the assay of the natriuretic markers BNP/NT-proBNP and the determination of a new biomarker, Copeptin (COOP), which appears to play an important predictive role in the onset of adverse events. **Objectives.** The aim of the study is to measure COOP (C-terminal precursor fragment of Vasopressin) in association with the BNP and pro-BNP natriuretic peptide assay, in patients who have developed ACS, in order to assess the possible prognostic significance and its contribution to monitoring disease progression. **Methods.** The study selected 53 patients afferent to the Unit of Electrophysiology, Study and Therapy of Arrhythmias at the AORN "Monaldi" in Naples, in the time interval between June 2021 and September 2022. The mean age of the test patients was  $68 \pm 3.5$  years of whom 40 were male and 13 were female. All of them had blood sampling at baseline from the onset of the acute event (T0) in order to assess the following markers: COOP, BNP, NT-proBNP in addition to routine examinations. At 3-month follow-up, patients were re-evaluated for the primary endpoint of mortality from any cause, or new hospitalization related to heart failure or heart failure. **Results.** Assessing the results obtained from the BNP/NT-proBNP assay of the 53 patients at T0, we proceeded by stratifying our population into 4 quartiles by increasing values. BNP values were elevated in 88.6% of cases with a mean value of 3561 pg/mL. For the results obtained from the COOP assay at T0, we used the same stratification. COOP values were elevated in 48% of cases with a mean value of 38.98 pmol/L. Deepening the analysis of both diagnostic and clinical findings, it could be seen that for patients with high COOP concentrations at T0, the risk of developing an adverse event at 3 months was higher than for patients with lower COOP values at T0. In addition, a direct correlation was observed between high values at T0 and disease severity. **Discussion.** The assay of the COOP fraction, which is produced in amounts equimolar to AVP in the bloodstream, is simpler and more reliable, which is why COOP can be used as a surrogate marker of the blood concentration of Vasopressin. The COOP assay has clinical interests in relation to multiple functions: cardiovascular, renal, and stroke, although its biological function, to date, is still unclear. In ACS, in addition to the natriuretic peptide assay, the COOP assay may be performed, which would appear to play an important predictive role on patients' mortality and composite cardiovascular endpoint. Hence, its evaluation in this disease, could take on a major prognostic role by flanking its assay with those of the tests already in use. **Conclusions.** Diagnostic data cross-referenced with clinical data from the patients under study showed that high COOP concentrations at T0 correlated with increased mortality from any cause, or new hospitalizations related to worsening clinical status within 3 months of disease onset. In addition, a higher concentration of COOP at T0 appears to be associated with more severe forms of ACS and correlated with prognostic values of BNP, giving important information about patients' risk of developing an adverse event. Updating Laboratory Diagnostics can provide the clinician with more weapons for monitoring and treating the patient with heart failure. We hope that the Copeptin assay can enter common laboratory practice for the evaluation and diagnosis of patients with ACS.

**Key-words:** Heart Failure; Copeptin; N-terminal proBNP; Cardiovascular biomarker