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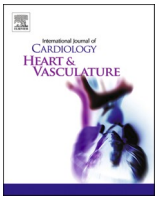

Editorial

The burden of congestion monitoring in acute decompensated heart failure: The need for multiparametric approach

The evaluation of congestion and hemodynamic in patients with acute decompensated heart failure (ADHF) is the cornerstone for the correct management of the clinical course of the diseases [1,2].

Previous studies [3] demonstrated the negative prognostic impact of residual congestion in patients with ADHF in pre-discharge phase. Rubio-Gracia et al. [3] observed that more than 75 % of patients with ADHF were discharged with congestive status ranging from mildly to moderate/severe as assessed by composite congestion score. This was associated to 88 % increased risk in re-admissions rate for heart failure and 54 % in all-cause mortality risk [3].

Meanwhile, the higher the congestion degree of patients admitted for ADHF, the longer the hospital stay [4], thus negatively impacting on the overall financial burden of ADHF management.

The 2021 Guidelines from the European Society of Cardiology (ESC) on the management of heart failure clearly defined the evaluation of congestion and perfusion as the primum movens in the diagnostic and therapeutic work-up of patients with ADHF, as they defined the correct behaviour for the application of pharmacological treatments in the acute phase [2]. Indeed, the scant reproducibility of signs and symptoms of congestion [2] forced physicians to find different roadmaps – mainly integrated ones [5,6] – for better evaluating patients with ADHF.

The accumulation of excess fluid in the lungs and peripheral tissues is a central aspect of AHF, leading to symptoms such as dyspnea, edema, and elevated jugular venous pressure. However, the pathways leading to congestion in AHF are complex and multifaceted, necessitating a thorough reevaluation of current understandings and treatment approaches. For this reason, the evaluation of patient with ADHF by physical examination might be considered as simplistic and could provide inaccurate data and negative impact on patients' prognosis [7].

The diagnostic value of clinical markers of congestion is limited. Like flipping a coin, the hazardous evaluation of congestion by mainly clinical signs and symptoms leads to decreased identification rate of residual congestion [8].

The application of technology in intensive care units (ICUs) improves the efficacy and efficiency of teams in providing prompt help to individuals who are in worsening phase [9].

Bioimpedance vector analysis (BIVA) could be considered as a possible technique for a comprehensive evaluation of the burden of congestion of patients with ADHF [10]. BIVA previously demonstrated a higher reproducibility rate in detecting peripheral congestion in ADHF as compared to brain natriuretic peptide (BNP) [10]. Indeed, single approach techniques to the identification of residual congestion might be detrimental for the correct evaluation of patients with ADHF. A multiparametric approach would be much more insightful for diagnostic and prognostic information on patients with ADHF [6]. The recent position statement from the Heart Failure Association of the European Society of Cardiology [11] underlines the need for a comprehensive evaluation of congestion status of patients with ADHF during the pre-discharge phase. Nevertheless, continue monitoring of congestion during hospital stay is fundamental in order to provide data to clinicians for instant modification of therapies and updated management of patients [7].

Different scores that imply the use of clinical and non-clinical parameters – might be applied in ICU for monitoring patients with congestion [12], but their complexity and the need for waiting for answers might delay the exact evaluation of patients.

Dedicated technological instruments might alleviate this challenging issue by helping clinicians to better delineate the congestive status of patients with ADHF [13].

Continuous Monitoring System Technology (CMST) – for example – proved to be reduced the length of stay in ICU and correspondingly promote effective estimated cost savings [9]. CMST might effectively reduce ICU utilization, shorten lengths of stay, and lower healthcare costs. By leveraging real-time data and early intervention capabilities, CMST can enhance patient care and streamline hospital operations. However, successful implementation requires careful consideration of workflow integration, data management, and cost-effectiveness. As technology advances, the potential for CMS to transform healthcare delivery will only grow, making it an indispensable tool in modern medicine.

Within this setting, the pulse contour cardiac output monitor PiCCO seems able to calculate hemodynamic parameters of preload, afterload, cardiac output, systemic vascular resistance and extravascular lung water [14,15]. By integrating all of these data, a daily – or even instant by instant – evaluation of the hemodynamic situation of patients would be available, thus allowing adequate modifications of therapies and more specific management of congestion.

Such a proposal might be really interesting when dealing with ultrafiltration. Ultrafiltration represents current option for counteracting congestion status in ADHF but issues related to monitor therapy and preventing volume depletion still represent a critical point for implementing treatment options in ADHF [16].

Although attempts have been performed with point of care ultrasonography (POCUS) by studying the characteristics of the waveform of the major abdominal veins [17], limitations persist in this specific setting.

Combined clinical and instrumental evaluations in this setting would certainly improve the management of this specific category of patients,

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thus allowing amelioration in their outcomes and quality of life.

Further analysis and clinical trials are needed in order to better address the evaluation of "hard outcomes" in the setting of multiparametric approach to congestion evaluation in ADHF patients. Nevertheless, the need for approaching the congestion evaluation in HF with a multiparametric vision should be the next level action of physicians when dealing with this type of patients.

Author statement

Dr Pietro Scicchitano and Dr Francesco Massari approve the final version of the manuscript being submitted. We warrant that the article is the authors' original work, hasn't received prior publication and isn't under consideration for publication elsewhere.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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