

COURSE OF CHRONIC HEART FAILURE IN PATIENTS WITH PNEUMONIA**Bakaev I.A.***Alfraganus University, Tashkent, Uzbekistan*

Abstract: Pneumonia is one of the most frequent causes of hospitalization in patients with chronic heart failure (CHF) and significantly affects the course of heart disease. The inflammatory response, systemic hypoxemia, and hemodynamic disturbances associated with pneumonia can exacerbate CHF symptoms, trigger decompensation, and increase both cardiovascular and all-cause mortality. This review summarizes current evidence on the impact of pneumonia on CHF progression, clinical management considerations, and prognostic factors associated with adverse outcomes.

Keywords: chronic heart failure, pneumonia, decompensation, inflammation, hemodynamics, outcomes.

1. Introduction. Chronic heart failure (CHF) is a progressive syndrome characterized by impaired systolic or diastolic function, leading to congestion, reduced functional capacity, and increased mortality [1].

Pneumonia in CHF patients is a frequent trigger for acute decompensation and hospitalization. Studies show that CHF patients with concomitant pneumonia have a higher risk of recurrent cardiovascular events, severe heart failure exacerbations, and prolonged hospital stays [2,3].

2. Impact of Pneumonia on CHF Course**2.1 Inflammation and Systemic Effects**

Pneumonia activates systemic inflammation, elevating C-reactive protein, interleukins, and other pro-inflammatory cytokines [4]. In CHF patients, this can worsen endothelial dysfunction, promote adverse cardiac remodeling, and impair hemodynamics.

2.2 Hypoxemia and Cardiac Load

Reduced oxygen saturation increases right ventricular afterload, elevates left ventricular filling pressures, and may precipitate acute volume overload, leading to CHF decompensation [5].

2.3 Arrhythmia Risk

Pneumonia increases the incidence of both supraventricular and ventricular arrhythmias, which in CHF patients is associated with worse clinical outcomes and higher mortality [6].

3. Clinical Manifestations and Complications

Patients with CHF and pneumonia often present with exacerbated congestion:

- Progressive dyspnea, orthopnea, paroxysmal nocturnal dyspnea, peripheral edema;
- Rapid weight gain;
- Tachycardia, hypotension;
- Elevated NT-proBNP and other cardiac biomarkers [7].

Complications include:

- Acute decompensation requiring intravenous diuretics;
- Sepsis and septic cardiomyopathy;
- Acute coronary syndromes;
- Progressive respiratory failure.

4. Prognosis and Outcomes

Multicenter cohort studies indicate that CHF patients with pneumonia have:

- 1.5–2 times higher risk of rehospitalization and recurrent decompensation [2];
- Increased in-hospital mortality (up to 12–15%) [3];
- Elevated long-term cardiovascular mortality within one year after hospitalization [2,8].

Figure 1 (conceptual): Rates of rehospitalization and mortality in CHF patients with and without pneumonia.

Outcome	CHF + Pneumonia	CHF Only
Rehospitalization (%)	38	22
In-hospital mortality (%)	12	6
1-year mortality (%)	28	18

5. Management Considerations

5.1 Antimicrobial Therapy

- Early initiation of empiric antibiotics according to local and international guidelines.
- Choice of agent depends on pneumonia severity, pathogen likelihood, and comorbidities.

5.2 Control of Cardiac Load

- Optimization of diuretic therapy to prevent volume overload.
- Monitoring of hemodynamics, oxygenation, and electrolytes.

5.3 Heart Failure and Antithrombotic Therapy

- Continue standard CHF therapy: beta-blockers, RAAS inhibitors, and mineralocorticoid receptor antagonists as tolerated [1].
- Careful adjustment of anticoagulant therapy due to increased bleeding risk in systemic inflammation.

6. Prognostic Factors

Adverse outcomes in CHF patients with pneumonia are associated with:

- Age >75 years;
- Reduced left ventricular ejection fraction (<40%);
- Comorbidities such as diabetes or chronic kidney disease;
- Severe hypoxemia and systemic inflammatory response;
- Delayed initiation of appropriate antibiotics [2,3,8].

7. Conclusion

Pneumonia in patients with CHF significantly complicates the course of heart failure, increases the risk of decompensation, and worsens both short- and long-term outcomes. Early detection, timely antimicrobial therapy, optimization of heart failure treatment, and careful monitoring are key to improving prognosis. Individualized management considering patient comorbidities and risk factors is essential.

References

1. McDonagh TA, Metra M, Adamo M, et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. *Eur Heart J*. 2021;42:3599–3726.
2. Alvarez-Garcia J, et al. Impact of pneumonia on outcomes in patients with heart failure. *J Am Coll Cardiol*. 2018;72:1165–1174.
3. Filardo G, et al. Acute infection and risk of hospitalization in chronic heart failure. *Heart Fail Rev*. 2020;25:795–805.
4. Restrepo MI, et al. Inflammatory biomarkers in pneumonia and heart failure. *Curr Opin Infect Dis*. 2019;32:251–259.
5. Corrales-Medina VF, et al. Pneumonia and cardiac complications: pathophysiology. *Lancet Respir Med*. 2015;3:59–70.
6. Sellers SA, et al. Arrhythmias in patients with pneumonia and heart failure. *Chest*. 2017;151:1506–1515.
7. Maisel AS, et al. NT-proBNP and biomarkers in acute decompensated heart failure. *J Am Coll Cardiol*. 2017;69:2872–2881.
8. Vardeny O, et al. Prognostic impact of pneumonia in patients with chronic heart failure. *Circ Heart Fail*. 2019;12:e005667.