Echocardiographic characteristics of patients admitted with acute heart failure with a previous history of cancer: a single-centre observational study

Todd F.1; Wong C.1; Mohamed A.1; Hewitson L.1; Doolub G.1; Gogola L.1; Skyrme-Jones A.1; Aziz S.1; Sammut E.3; Dastidar A.1

1Southmead Hospital, Bristol, United Kingdom of Great Britain & Northern Ireland
2Barts Heart Centre, London, United Kingdom of Great Britain & Northern Ireland
3University Hospitals Bristol and Weston NHS Foundation Trust, Bristol, United Kingdom of Great Britain & Northern Ireland

Funding Acknowledgements: Type of funding sources: None.

Background

Cancer and heart failure frequently co-exist, with cancer and chemotherapy exerting a number of pathological effects on the myocardium. Despite this, our understanding of the clinical impact of previous history of cancer in acute heart failure remains unclear. We therefore performed a retrospective cohort study to identify the echocardiographic characteristics in patients admitted with acute heart failure with and without a diagnosis of solid organ cancer.

Methods:

Consecutive patients with signs and/or symptoms of acute heart failure admitted over a period of 33 weeks (7th January – 28th August 2020) were identified. Discharge summaries, electronic notes and shared care networks were manually searched to determine baseline demographics, admission bloods, comorbidities, cancer diagnoses, imaging and echocardiography. Univariate and multivariate Cox regression analysis was performed to identify clinical and biochemical predictors of mortality.

Results

In total, 478 patients were admitted with acute heart failure over the study period (mean age 80 ± 11 years, 53.6% were male and mean NT pro-BNP was 9106). 386 had echocardiography available for review. Of these, 64 (16.6%) had a past or current history of solid organ cancer.

Patients with a past or current history of solid organ cancer had a significantly higher ejection fraction (48% (±9%) vs 44% (±11%), p = 0.003), higher incidence of heart failure with preserved ejection fraction (57.8% vs 33.5%, p < 0.001) and lower incidence of right ventricular impairment (defined using both visual inspection and TAPSE measurements) (25.0% vs 47.8%, p < 0.001).

There were no significant differences in any valvular pathologies between groups (overall prevalence 71.9% vs 71.7%, p = 0.982) No difference was observed between the rate of prior myocardial infarction (28.1% vs 26.0%, p = 0.727) or lung disease (34.4% vs 37.0%, p = 0.692).

Overall, mortality at six months follow up was significantly higher in the group with a current or previous cancer diagnosis (43.4% vs 32.0%, p = 0.046) compared to the group without.

Conclusion: Patients admitted with acute heart failure and a past or current history of cancer have a significantly higher ejection fraction and lower prevalence of right ventricular impairment. Despite the higher ejection fraction their prognosis is worse. Further work is needed to determine potential mechanisms for this, as well as its clinical implications.

Abstract Figure. Six Month Survival Kaplan Meier Graph

Six-month Survival: Cancer vs non-Cancer

![Six-month Survival Kaplan Meier Graph](image)

*Figure 2 Kaplan Meier survival graphs of patients with and without cancer over six months.*
Prevalence of echocardiographical features between groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>HFpEF</th>
<th>RV Impairment</th>
<th>Valvular Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>57.8</td>
<td>71.9</td>
<td>71.7</td>
</tr>
<tr>
<td>Non-Cancer</td>
<td>33.5</td>
<td>25.0</td>
<td></td>
</tr>
</tbody>
</table>

- HFpEF: p<0.001
- RV Impairment: p<0.001
- Valvular Disease: p=0.982