CONTEMPORARY NATURAL HISTORY OF HEART FAILURE IN NOVA SCOTIA, CANADA

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BACKGROUND

- Heart failure imposes an enormous burden on individuals and on society, being among leading causes of hospitalization in Canada. This burden is the highest among the elderly.
- In the 1990’s in Nova Scotia, within the year following an initial hospitalization for heart failure, over half (51%) were either rehospitalized (31%) or died (29%).
- There is a remarkable paucity of contemporary information on the epidemiology and treated natural history of heart failure in Canada.

OBJECTIVES

- The objective of this study was to determine occurrence, hospitalization and mortality from heart failure in the province of Nova Scotia, using more recent data.

METHODS

- We undertook a retrospective cohort study using population-based administrative health databases including hospital discharge abstracts, outpatient physician claims data, and medication dispensation claims from Nova Scotia (2014 population 922,000).
- All study subjects were adults with a first hospitalization diagnosis of heart failure between April 2009 and March 2013. The subjects were followed until March 2014, yielding between a minimum of one and up to five years follow-up for each subject.
- Outcomes included incidence of heart failure hospitalizations, demographics, heart failure treatments received, and one-year mortality and readmission after an initial hospitalization for heart failure.
- Data on dispensed medications were available for the subset of subjects aged 65 years and older.
- Diagnoses in hospital were coded using the International Classification of Diseases, Tenth Revision, and medications were coded using the Anatomical Therapeutic Chemical Classification System.
- Kaplan-Meier analyses were conducted to characterize time to death and to readmission for heart failure.

RESULTS

- Between April 2009 and March 2013, 12,957 subjects had a first hospitalization for heart failure.
- The sample included approximately equal numbers of women and men (Table 1).
- The mean age at hospitalization was 76.2 years (standard deviation [SD] = 12.9).
- In 2012-2013, the annual incidence per 100,000 was 274 among women and 287 among men.
- Following the initial hospitalization, the median survival was 3.2 years (95% confidence interval [CI] 3.1-3.3).
- At one year (Figure 1): • Mortality was 35% (95% CI 34%-36%). • Rehospitalization for heart failure was 33% (95% CI 32%-34%). • The composite outcome of re-hospitalization or death was experienced by 53% (95% CI 52%-54%). • At five years: • Mortality was 60% (95% CI 59%-61%). • Rehospitalization for heart failure was 56% (95% CI 54%-58%).
- The composite outcome of re-hospitalization or death was experienced by 77% (95% CI 76%-79%).
- Drug claims dispensation data was available for a subset of 8,758 (69.5%) subjects over age 65 years (Table 2).
- The most common treatments received were diuretics (73%), beta-blockers (64%), anti-hypertensive agents (53%), and ACE inhibitors (45%).

DISCUSSION

- This study reaffirms the observation that heart failure continues to be a leading and rapidly progressing cause of morbidity and mortality in Canada.
- In Nova Scotia, the proportions of patients rehospitalized and dying within one year of an initial hospitalization has remained the same since the 1990s. This finding highlights the lack of improvement in treating heart failure in Canada.

Table 1: Age and sex distribution of N=12,957 individuals hospitalized for heart failure, for individuals with pharmaceutical coverage

<table>
<thead>
<tr>
<th>Sex (n, %)</th>
<th>n / mean / median</th>
<th>% / SD / IQR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>6,343</td>
<td>50.4</td>
</tr>
<tr>
<td>Female</td>
<td>6,254</td>
<td>49.6</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>(Mean, SD)</th>
<th>(Median, IQR)</th>
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</thead>
<tbody>
<tr>
<td>18–40</td>
<td>76.2</td>
<td>68, 86</td>
</tr>
<tr>
<td>41–65</td>
<td>73.0</td>
<td>69, 82</td>
</tr>
<tr>
<td>66–70</td>
<td>71.9</td>
<td>71, 81</td>
</tr>
<tr>
<td>71–75</td>
<td>71.5</td>
<td>71, 80</td>
</tr>
<tr>
<td>76–80</td>
<td>71.8</td>
<td>72, 83</td>
</tr>
<tr>
<td>&gt;80</td>
<td>71.6</td>
<td>72, 83</td>
</tr>
</tbody>
</table>

Table 2. Medications dispensed following first observed heart failure diagnosis, for N=8,758 Nova Scotians aged 65 years and over after a first hospitalization for heart failure between April 2009 and March 2013 followed for up to five years

<table>
<thead>
<tr>
<th>Overall follow-up</th>
<th>First 365 days</th>
<th>First 30 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>n / %</td>
<td>n / %</td>
<td>n / %</td>
</tr>
</tbody>
</table>

Table 3. Medications dispensed following first observed heart failure diagnosis, for N=8,758 Nova Scotians aged 65 years and over after a first hospitalization for heart failure between April 2009 and March 2013 followed for up to five years

REFERENCES

ACKNOWLEDGEMENTS

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<85<75<70<65<60<50<40<30<20<10<0