Economic Evaluation of Healthcare Resource Utilization and Costs for Patients With Newly Diagnosed Light-Chain Amyloidosis

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INTRODUCTION

- Amyloid light-chain (AL) amyloidosis is a rare disease characterized by the deposition of amyloid light-chain fibrils into organs, most frequently the heart and kidneys[1,2]
- Patients with AL amyloidosis experience organ damage and dysfunction, and if left untreated the disease can be fatal[1,2]
- The prognosis of patients with AL amyloidosis is poor, and management and treatment can be costly[3]

OBJECTIVE

- To compare rates of inpatient hospitalizations, outpatient specialist visits, sickness absences, and direct and indirect costs in patients with newly diagnosed AL amyloidosis vs individuals without AL amyloidosis in Sweden

METHODS

- Patients with amyloidosis were identified from the Swedish National Patient Register, and linked with the Cancer Register, the Prescribed Drug Register, the Cause of Death Register, and the Longitudinal Integrated Database for Health Insurance and Labour Market Studies
- Adult patients ≥18 years at index date (date of first observed diagnosis code) with newly diagnosed AL amyloidosis were identified (**Supplemental Data**) based on having ≥2 diagnosis codes for amyloidosis (Swedish implementation of *International Classification of Diseases, Tenth Revision* [*ICD-10-SE*] codes E85.4x, E.85.8x, E85.9) from January 1, 2011, to December 31, 2019, plus ≥1 of the following:
  - Receipt of antiplasma cell therapy
  - An amyloidosis diagnosis made in a hematology/oncology clinic

  and/or
  - A diagnosis code specific to AL amyloidosis (*ICD-10-SE* E85.8A)
- For each case of AL amyloidosis, individuals without any type of amyloidosis were selected and matched from the Swedish Total Population Register with a maximum ratio of 1:5 based on age, sex, calendar year, and county
- Per-patient-per-year (PPPY) outcome measures (eg, all-cause medical/pharmacy and medical costs, hospitalizations, and outpatient visits) were compared between the 2 groups to account for variable lengths of follow-up
- Inpatient and outpatient costs were estimated using diagnosis-related group costs while prescription costs were captured as an exact measurement from the Prescribed Drug Register

HEME OTHER

RESULTS

Baseline characteristics

- 846 patients with newly diagnosed AL amyloidosis and 4227 matched comparators were identified
- Baseline sociodemographic and clinical characteristics are shown in the **Table**
  - Overall, the median age was 70 years and 41% of all individuals were female
- Compared with comparators, patients with AL amyloidosis had a significantly higher mean Charlson Comorbidity Index (CCI; *P*<0.001) and higher rates of heart failure (*P*<0.001) and renal failure (*P*<0.001) at baseline
- Percentage of working-age patients with AL amyloidosis who were in employment was significantly lower than that of controls at index year

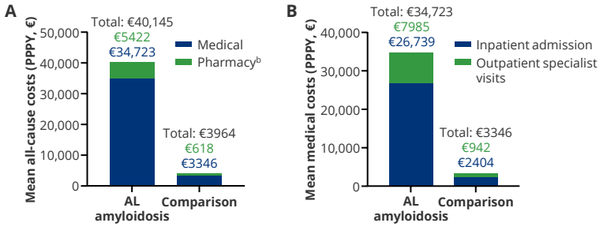
TABLE: Sociodemographic and clinical characteristics

	Patients with AL amyloidosis (n=846)	Comparison group (n=4227)	Standardized difference	*P*-value
Age, median (range), years	70 (22–93)	70 (22–93)	0	0.991
Female, n (%)	347 (41.0)	1735 (41.0)	0.001	1.000
Multiple myeloma diagnosis prior to AL amyloidosis diagnosis, n (%)	84 (9.9)	4 (0.1)	0.463	<0.001
CCI, mean (SD)	1.7 (1.8)	0.4 (1.0)	0.895	<0.001
Comorbid conditions, n (%)[a]				
Heart failure	251 (29.7)	199 (4.7)	0.701	<0.001
Renal failure	105 (12.5)	69 (1.6)	0.432	<0.001
Employment status at index year, n (%)				
Working-age patients	280 (33.1)	1400 (33.1)		
Employed among working-age patients	153 (54.6)	927 (66.2)		<0.001

[a]Pre-index period started January 1, 2006.

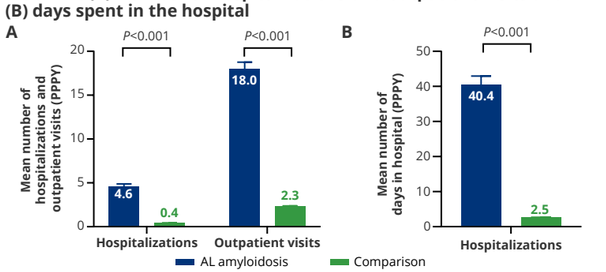
- Patients with AL amyloidosis incurred €36,181 (*P*<0.001) higher average PPPY all-cause direct costs, with an incremental difference of €31,377 (*P*<0.001) due to medical costs from inpatient admissions and outpatient specialist visits (**Figure 1**)
- Patients with AL amyloidosis had €3688 (*P*=0.004) higher average PPPY indirect costs than comparators (mean [SD]: AL amyloidosis, €4088 [36,956]; comparator, €400 [3256])
- During follow-up, patients with AL amyloidosis had higher PPPY number of hospitalizations, outpatient visits (**Figure 2A**), and days in the hospital than the comparison group (**Figure 2B**)

FIGURE 1: (A) All-cause medical/pharmacy and (B) medical costs[a]



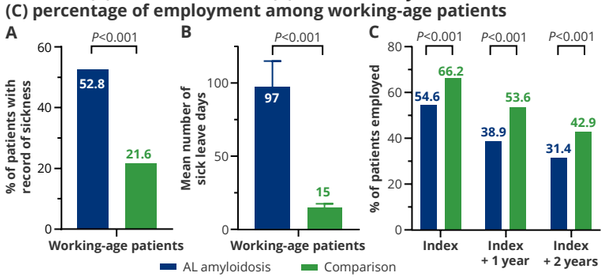
[a]Costs were adjusted for inflation using Sweden's labor cost index for 2019 and converted to € using the 2019 average conversion rate of SEK 1 = € 0.0945. [b]Pharmacy costs reflected outpatient pharmacy prescriptions. Costs associated with intravenous and subcutaneous agents administered in a clinic or hospital setting were not captured.

FIGURE 2: (A) Number of hospitalizations and outpatient visits and (B) days spent in the hospital



- Among working-age patients (AL amyloidosis, n=280; comparators, n=1400), patients with AL amyloidosis had 10.4% higher percentage of sickness absence (*P*<0.001; **Figure 3A**) and significantly higher days of sick leave (**Figure 3B**)
- Lower percentages of patients with AL amyloidosis were employed in the index year (54.6%) than the comparison group (66.2%) and over time (**Figure 3C**)

FIGURE 3: (A) Sickness absence, (B) sick leave days, and (C) percentage of employment among working-age patients



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KEY TAKEAWAY

The results from this study highlight the substantial healthcare costs of AL amyloidosis to patients, employers, and society in Sweden

CONCLUSIONS

- Incremental total costs associated with AL amyloidosis consisted mainly of medical care and inpatient admission costs
- Drug cost estimates were underestimated since costs associated with intravenous/subcutaneous antineoplastic therapy and other drugs administered in a hospital or clinic were not reflected in these cost estimates. Healthcare utilization costs were also underestimated due to the lack of primary care data in the Swedish registers
- Patients with AL amyloidosis had higher rates of hospitalization, outpatient visits, and absences from work due to sickness and lower overall employment rates

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DISCLOSURES

U-HM has received honoraria from Janssen and Celgene. **QC**, **LLH**, and **EMA** are currently employed by and hold equity in Janssen. **MG** was employed by Janssen at the time of the study. **AA** and **MT** are currently employed by Janssen. **JB** and **IR** are employed by SDS Life Science, Sweden. **MH** has nothing to disclose.

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