

Acromegaly significantly impacts employees' health benefit costs and increases work absenteeism

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BACKGROUND

- Acromegaly is a rare (11.7 cases per million person-years in the United States) chronic disorder of growth hormone (GH) hypersecretion¹ that is most commonly diagnosed during patients' most-productive working years.²
- Data on acromegaly's impact on employer's health benefit (direct and indirect) costs and work absenteeism are limited.

OBJECTIVE

- The aims of this research were to understand:
 - Differences in comorbidities of patients vs. matched controls.
 - Utilization of drug treatments between patients vs. controls and patient use of acromegaly treatments.
 - The impact on employers in terms of health benefit costs and lost work time.

METHODS

- This research analyzed information (recorded January 2010 to April 2019) from the Human Capital Management Services Research Reference database of de-identified health claims (with information on 2.9 million employees, including human resource data on payments and absenteeism).
- Patients with acromegaly were retrospectively identified based on claims with International Classification of Disease (ICD)-9 code 253.0 (acromegaly or gigantism)³ or ICD-10 code E22.0 (acromegaly or pituitary gigantism).⁴
- Patients (18–64 yr) with acromegaly who were included in the study had ≥ 2 diagnoses of acromegaly ≥ 30 days apart, or 1 diagnosis of acromegaly during the study period plus either a diagnosis of pituitary adenoma or 1 claim for pituitary surgery (hypophysectomy) or stereotactic radiosurgery.

- Patients were excluded if they were not continuously employed during the 12-month follow-up or had < 12 continuous months of claims information available.
- For each eligible patient with acromegaly, 20 control employees who did not have acromegaly were matched by: demographics (age, gender, race, marital status), job-related variables (salary, full-time or part-time status), region of the country, and index date.
- Cost data were adjusted to constant dollars using components of the Consumer Price Index (CPI)⁵: medical costs used the medical CPI, prescription drugs used the prescription drug CPI, and indirect costs used the general CPI.
- Outcomes included direct costs (medical and pharmacy), indirect costs (absence payments by benefit type), and lost time (absences by benefit type).
- Outcomes were analyzed using 2-part stepwise regression (logistic followed by generalized linear) models for outcome, demographic, and job-related variables.
- In each case, the regression models controlled for the impact of such confounding factors as age, gender, marital status, race, exempt/nonexempt status, full-time/part-time status, salary, region, and the Charlson Comorbidity Index (CCI) score.

RESULTS

Cohort comparison analysis

- 47 eligible patients with acromegaly were identified and matched to 940 control subjects (Table 1).
- Employees with acromegaly:
 - Were 64.3% more likely to have undergone an MRI scan than the matched controls ($p < 0.0001$).
 - Did not always use acromegaly-indicated medications (57.0% had no use) during their 12-month follow-up.

Table 1: Baseline characteristics of the study populations

Variable†	Employees with acromegaly (N = 47)	Matched controls (N = 940)	p value
	Mean [Standard error]	Mean [Standard error]	
Age* (years)	47.8 [1.8]	45.7 [0.4]	0.2243
Tenure* (years)	7.7 [1.5]	7.8 [0.3]	0.9110
Gender (% Female)	40.4% [7.2%]	46.7% [1.6%]	0.3998
Married	14.9% [5.2%]	13.5% [1.1%]	0.7871
Not Married	21.3% [6.0%]	11.1% [1.0%]	0.0325
Married Missing	63.8% [7.1%]	75.4% [1.4%]	0.0737
White	19.1% [5.8%]	16.2% [1.2%]	0.5896
African American	2.1% [2.1%]	1.6% [0.4%]	0.7781
Hispanic	6.4% [3.6%]	4.0% [0.6%]	0.4326
Other Race	0.0% [0.0%]	2.3% [0.5%]	0.2888
Race Missing	72.3% [6.6%]	75.9% [1.4%]	0.5840
Exempt From Overtime†	27.7% [6.6%]	28.4% [1.5%]	0.9120
Annual Salary*‡	\$72,907 [\$7,724]	\$72,904 [\$1,702]	0.9996

* At index date. † An indicator of the percentage of the employee population who are classified as management versus other employees. ‡ For annual salary, data were based on 33 patients and 660 matched controls. Note: Sums may not equal 100.0% because of rounding.

- Of those taking an acromegaly medication:
 - 90% used a single drug, 5% used two agents, and 5% used three agents.
 - Somatostatin analogs were the most commonly used drugs [lanreotide (10.6%), long-acting octreotide (10.6%), and octreotide (2.1%)], followed by dopamine agonists [cabergoline (19.1%) and bromocriptine (4.2%)] and GH-receptor antagonists.
 - Ten patients (21.3%) underwent pituitary tumor surgery, with the majority (70%) receiving transnasal or transeptal excision.

Comorbidity analysis

- Employees with acromegaly had a higher CCI score than their control counterparts (0.60±0.15 vs. 0.30±0.03; $p = 0.029$).
 - Patients had significantly more claims for medical services associated with arthritis, chronic lung disease, diabetes, hyperlipidemia, hypertension, and thyroid disease (Figure 1).

Figure 1. Percent of cohort with comorbid condition claims

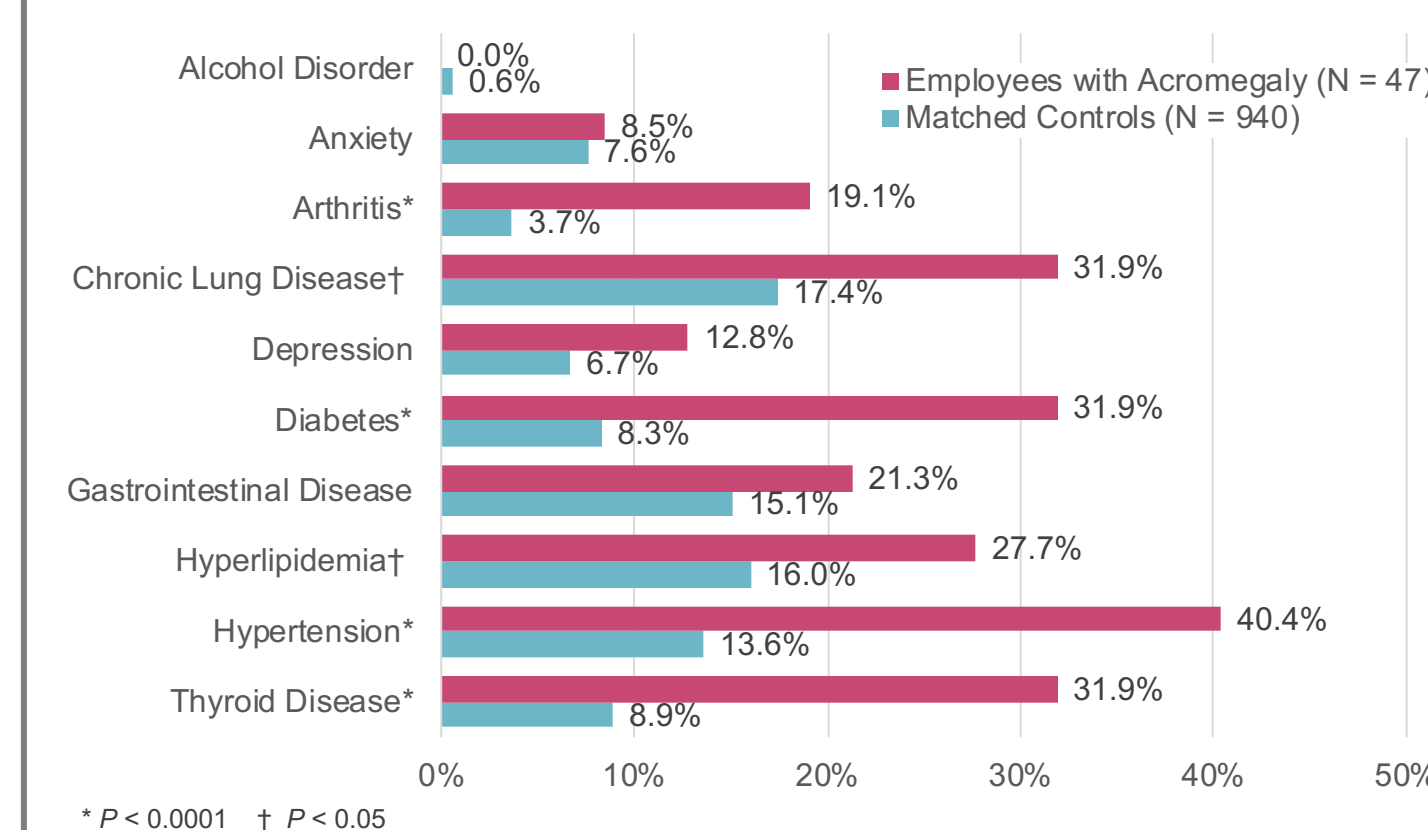


Figure 2. Direct and indirect cost comparison (means)

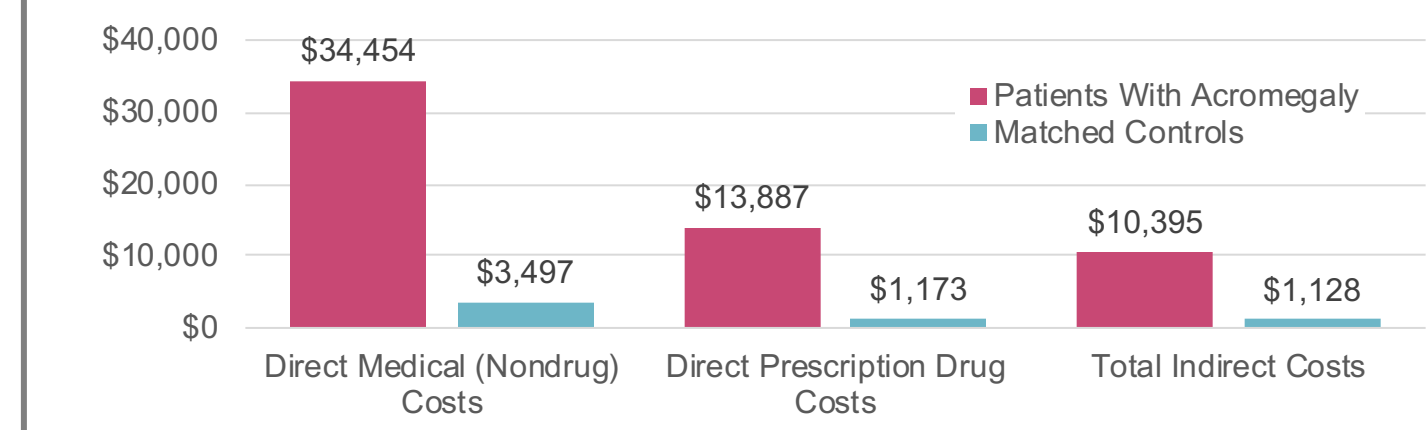


Table 2: Employee lost work time

Absence category	Employees with acromegaly		Matched controls		comparison	
	N	Adjusted* mean days [Standard error]	N	Adjusted* mean days [Standard error]	Δ	p value
Sick Leave	9	1.6 [1.4]	209	1.1 [0.1]	0.5	0.7039
Short-Term Disability	25	9.6 [3.6]	469	0.6 [0.2]	9.0	0.0117
Long-Term Disability	21	86.9 [86.9]	439	1.3 [1.3]	85.7	0.3362
Workers' Compensation	31	0.0 [0.0]	610	0.1 [0.1]	-0.1	0.1212
Total Absence Days†		98.2		3.1		95.1

† Sum of above (Sick Leave + Short-Term Disability + Long-term Disability + Workers' Compensation)
*Means adjusted by two-part regression models controlling for age, tenure, gender, marital status, race, exempt status, salary, region of the country, spouse vs. employee indicator variable, and Charlson Comorbidity Index score.

Health cost analysis

- The direct medical (nonpharmaceutical) costs, prescription drug costs, and total indirect costs of patients with acromegaly were greater than that for matched controls (Figure 2).
- Prescription drugs costs were 88.9% greater in patients with acromegaly than in controls.
 - Acromegaly-related drug costs (\$9,925 ± \$3,037) were 20.5% of the total direct medical expenditures in employees with acromegaly.
 - The cost of other prescription drugs was approximately double in the acromegaly cohort (\$2,255 ± \$506) compared with the matched controls (\$1,194 ± \$63, $p = 0.038$).
- Total mean direct health costs (medical and pharmaceutical) and total indirect costs were higher for individuals with acromegaly, with short-term and long-term disability combining to explain 96% of the difference, whereas workers' compensation costs were lower compared with the controls.

Lost work time analysis

- Employees with acromegaly had more total days absent, used more short-term disability time, but had similar number of sick days compared with the controls (Table 2).

CONCLUSIONS

- Acromegaly is linked to substantially higher total health benefit costs and work absenteeism compared with adults without acromegaly.

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