

Health-Related Quality of Life Burden in Endogenous Cushing's Syndrome: A Retrospective Medical Chart Audit Study

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INTRODUCTION

Endogenous Cushing's syndrome (CS) is a rare, debilitating disorder caused by chronic overproduction of cortisol¹⁻³

AIM

To evaluate the overall burden of endogenous CS as experienced by treated patients

METHODS

- A retrospective review of medical chart data of treated patients with confirmed endogenous CS was conducted and data were abstracted by board-certified or board-eligible endocrinologists in the United States
- A quantitative cross-sectional survey of the endocrinologists managing these patients was conducted concomitantly
- The survey included a web-enabled questionnaire that captured physician-level data and a case report form that captured patient medical chart data
- Statistical analysis was conducted using SAS 9.4 (SAS Institute Inc., Cary, NC, USA) and Q Research Software 5.6. (Q Research Software, New York, NY)
- Eligibility criteria for medical charts were:
 - Patients were ≥ 21 years of age
 - Patients had received a physician confirmed diagnosis of endogenous CS at least 3 months before the study
 - Patients had received at least one therapy to treat their endogenous CS within the past 12 months or were receiving therapy at the time of the study
- Patients who were diagnosed with adrenal or pituitary carcinomas were excluded

RESULTS

TABLE 1. PATIENT DEMOGRAPHICS AND CLINICAL CHARACTERISTICS

Characteristics	N = 273
Female, n (%)	165 (60%)
Age at diagnosis, (Mean \pm SD)	40.2 \pm 12.3 years
Age at the Most Recent Visit, (Mean \pm SD)	46.5 \pm 13.4 years
BMI at Diagnosis (kg/m ²) (Mean \pm SD)	33.3 \pm 8.3
BMI at the Most Recent Visit (kg/m ²), (Mean \pm SD)	31.6 \pm 8.3
Race/Ethnicity, n (%)	
White or Caucasian	147 (54%)
Black or African American	40 (15%)
Hispanic or Latino	36 (13%)
Asian	22 (8%)
Biracial/Multiracial	15 (5%)
Other	13 (4%)
Patient Insurance Type, n (%)*	
Private/Commercial	167 (61%)
Medicare/Medicaid	82 (30%)
Do not know/unsure	21 (8%)
Veteran's Administration/ Government/Military	6 (2%)
Other	0 (0%)
Cash-pay/None	1 (0%)
Top 3 Tumor Locations at Diagnosis, n (%)	N = 44
Pituitary adenoma	19 (43%)
Adrenal hyperplasia	11 (25%)
Adrenal adenoma	10 (23%)

*Note: Patients were allowed to select multiple insurance types, if applicable

Abbreviations: BMI: Body Mass Index; SD: Standard Deviation

- Sixty-nine physicians abstracted data from 273 unique medical charts of patients (Table 1)
- The mean \pm SD age of patients at the time of the survey was 46.5 \pm 13.4 years, with a 60:40 (female : male) gender split (Table 1)
- The mean duration of endogenous CS was 4.1 years

TREATMENT SUMMARY

TABLE 2. PATIENT THERAPY EXPERIENCE, AT THE TIME OF THE STUDY

Therapy Type, n (%)	N = 273
Drug Monotherapy Only	82 (30%)
Patients with Surgery	180 (66%)
Surgery Only	79 (29%)
Surgery and Drug Monotherapy	74 (27%)
Surgery and Radiation	11 (4%)
Surgery and Drug Combination	11 (4%)
Other (Including Surgery)*	5 (2%)
Other (Excluding Surgery)**	11 (4%)

Note: All treatments indicated are at the time of the study; * Surgery and Combination Pharmacotherapy and Radiation, Surgery and Monotherapy and Radiation ** Combination Pharmacotherapy only, Radiation only, Monotherapy and Radiation, Combination Pharmacotherapy and Radiation

- The majority (66%; n=180) of patients captured in the medical chart audit had received surgery with or without pharmacotherapy or radiotherapy within the past 12 months
- Of the patients who received surgery (n=180), 44% (n=79) had not undergone any further treatment post-surgery and 47% (n=85) were also being treated with drug monotherapy or combination pharmacotherapy (Table 2)
- 30% (n=82) of all patients were treated with drug monotherapy without surgery, at the time of the study (Table 2)
- Patients on monotherapy or combination pharmacotherapy (n=181) had a discontinuation rate of 25%

SYMPTOMATIC BURDEN

- The most reported symptoms across the care paradigm were fatigue, weight gain, acne, and muscle weakness
- Notably, symptoms declined post treatment, but none were eliminated
- None of the declines observed in symptom frequency reached statistical significance
- Most patients (79%), experienced 1-6 symptoms and 21% experienced ≥ 7 symptoms post-treatment

FIGURE 1. CS SYMPTOM GROUPINGS AT DIAGNOSIS (N=273)

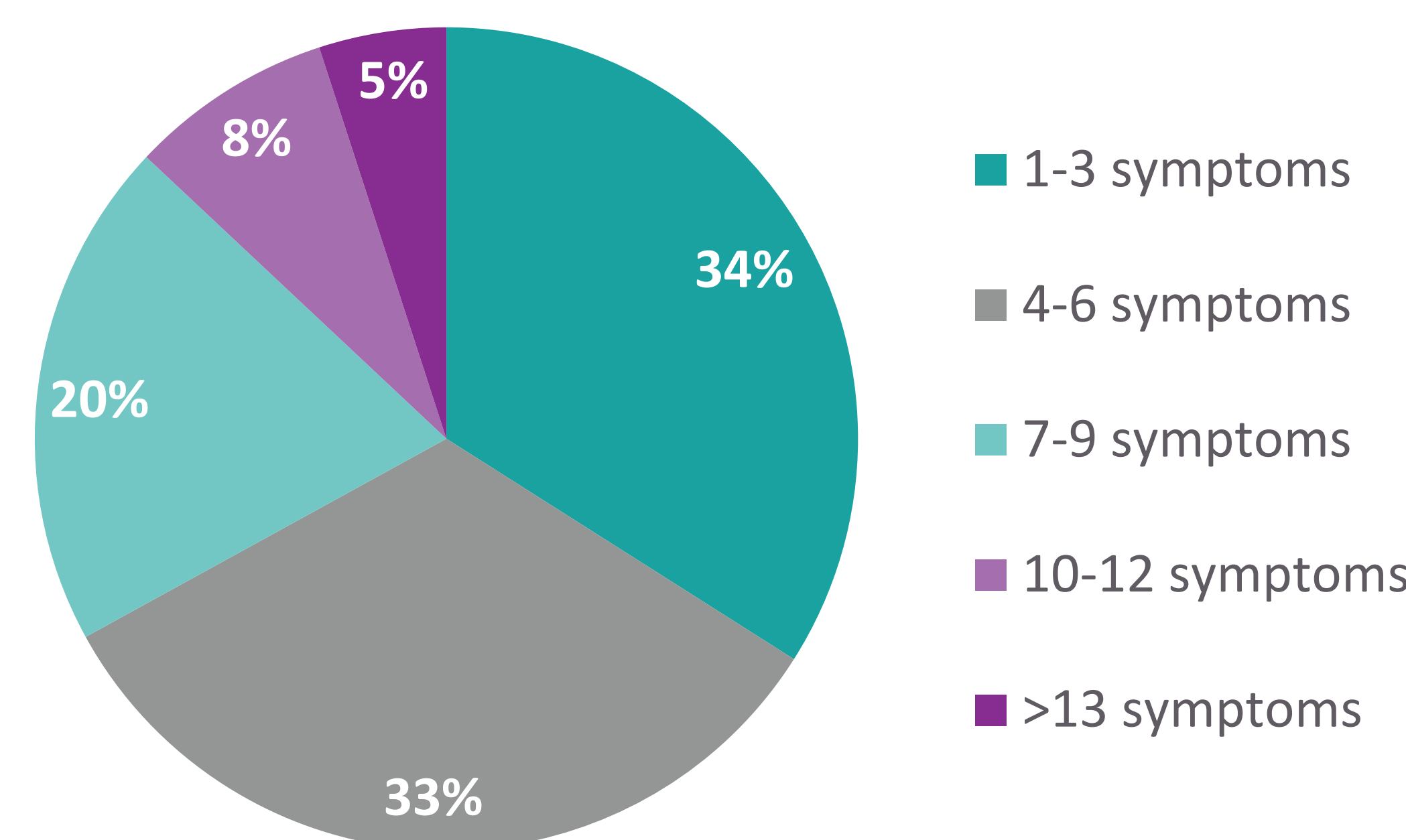


FIGURE 2. TOP 10 SYMPTOMS OF CS OVER TIME (N=273)

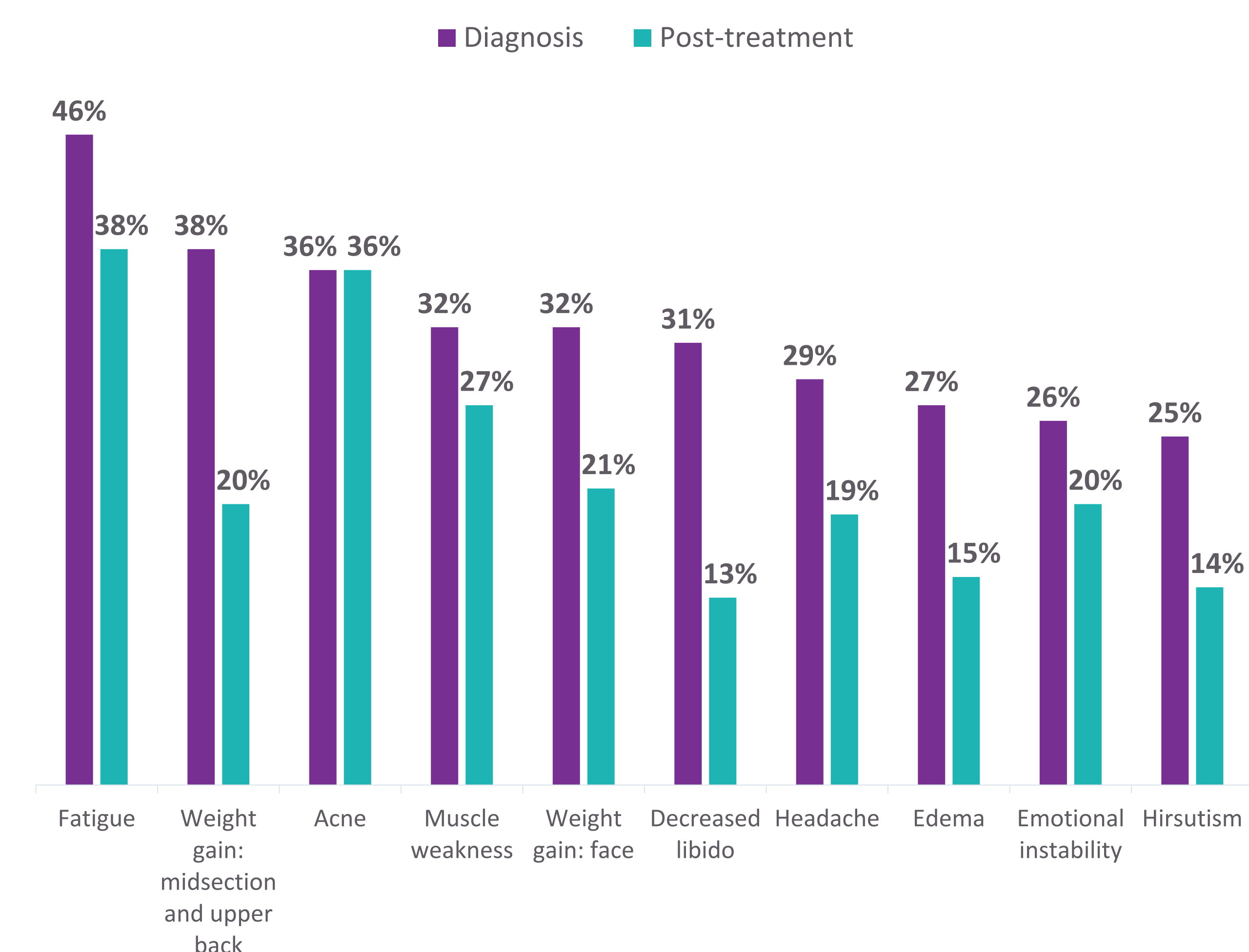
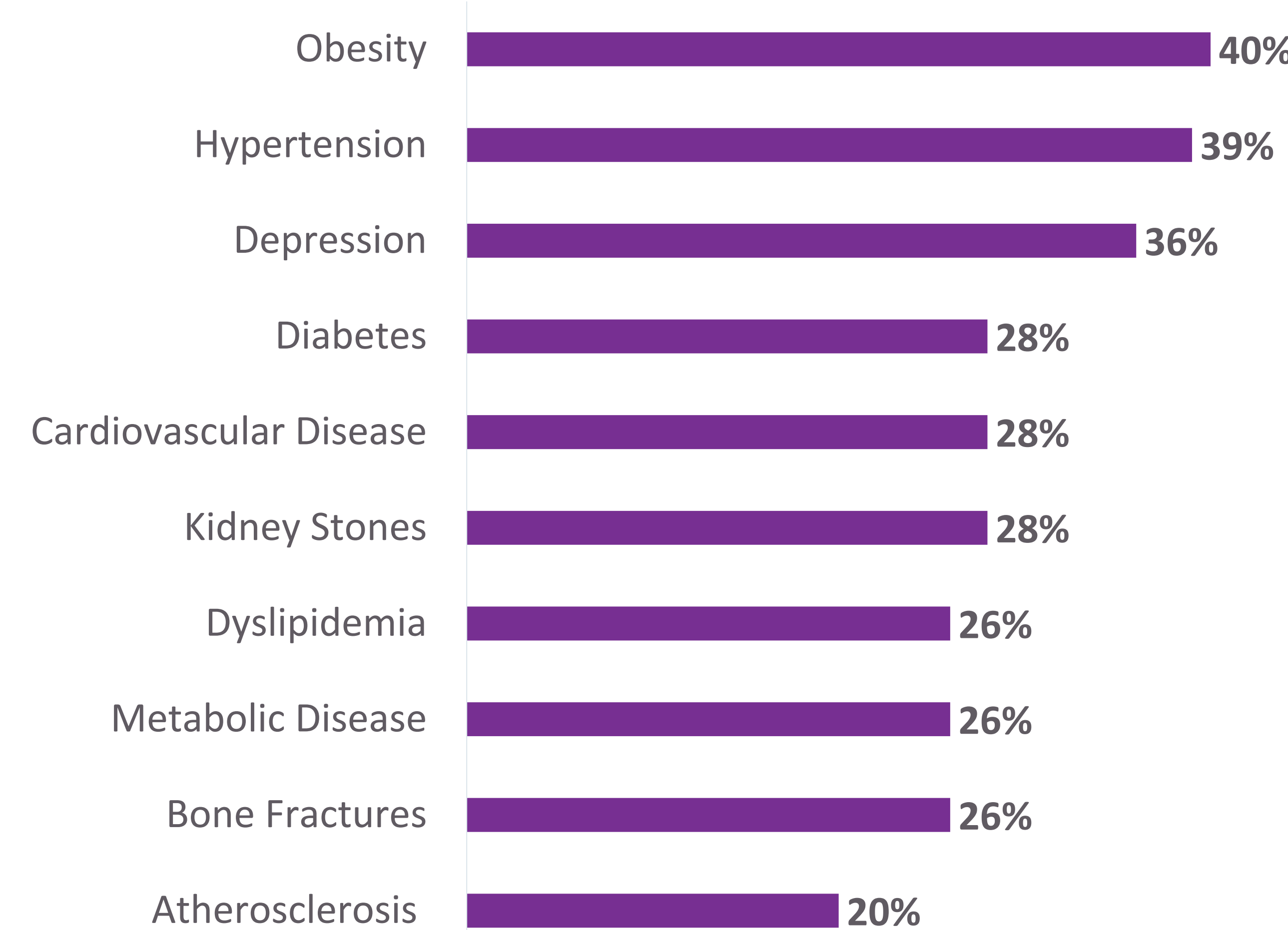


FIGURE 3. TOP 10 COMORBIDITIES REPORTED AT DIAGNOSIS (N=273)



ECONOMIC BURDEN*

- Patients required 1.0 \pm 1.4 hospitalizations annually due to complications from CS with a mean inpatient length of stay of 4.3 \pm 3.1 days per incident (Table 3)
- A mean of 4.3 \pm 6.3 outpatient visits or consultations annually due to complications were required
- Annually, patients required an average of 0.6 emergency room visits with no hospitalizations due to endogenous CS complications

*Economic burden data reflects reported annualized averages from responding physicians, based on patient charts

TABLE 3. HEALTHCARE RESOURCE UTILIZATION RELATED TO CS

Visit Type	Mean	Range	N
Annual Hospitalizations	1.0	0-10	273
Average Length of Inpatient Stays	4.3	1-21	140
Annual ER Visits	0.6	0-7	273
Annual Outpatient Visits	4.3	0-90	273

DISCUSSION

- This chart audit study confirmed the findings from a previous burden of illness (BOI) study conducted by the authors that demonstrated a holistic burden of cumulative endogenous CS symptoms on patients
- Patients continue to experience a high symptomatic burden even after seeking and receiving treatment to normalize their cortisol levels
- The inpatient care needs align with the national mean however, the above-average outpatient visits exceed the national average indicating there is an ongoing burden for the healthcare system in terms of outpatient direct costs⁵⁻⁸
- Among CS patients, high frequency health care visits driven by the high symptomatic burden may negatively affect health-related quality of life

CONCLUSIONS

- Patients with endogenous CS have a high symptomatic burden at diagnosis and continue to experience symptoms after receiving treatment
- The clinical burden of endogenous CS results in a direct economic burden in the form of healthcare resource utilization
- Further research should focus on addressing the long-term burden CS patients experience despite treatment

LIMITATIONS

- A limitation of this study is reporting bias. Physicians who extracted medical chart data at times lacked access to their patients' entire medical history (or associated details) including medical history prior to endogenous CS diagnosis, endogenous CS related procedures or treatments, and treatments unrelated to endogenous CS
- Given study objectives and the variability in treatment lines across the study population, statistical analyses across patients and over time were not conducted
- This study does not follow patients longitudinally, but rather at two points in time, pre and post treatment. This snapshot does not account for changes in symptoms, or comorbidities and other important events in the patient journey

ACKNOWLEDGEMENTS

Medical editorial assistance was provided by Diarra Oden and the Delivery And Quality Support team of Trinity Life Sciences. Funding for this study was provided by Strongbridge Biopharma plc, a wholly owned subsidiary of Xeris BioPharma Holdings, Inc.

