Health-Related Quality of Life, Work Productivity, and Indirect Costs among Patients with Diabetic Gastroparesis

Jessica L. Abel,[1] Kate Burslem,[1] Jalpa A. Doshi,[2] Lulu Lee[3]

[1]*Allergan plc, Madison, NJ, USA;* [2]*University of Pennsylvania, Philadelphia, PA, USA;* [3]*Kantar Health, San Mateo, CA, USA*

CONCLUSIONS

1. DG imposes a considerable burden on patients in terms of reduced HRQoL, work productivity loss, and impairment in daily activities
2. Higher work productivity loss among patients with DG translates into a significant burden to employers in indirect costs
3. These findings suggest the current management of DG may be suboptimal and highlight an opportunity to alleviate the societal burden associated with this condition through more effective treatment modalities

RESULTS

Demographics and Clinical Characteristics

- The sample population included 236 respondents (118 patients with DG and matched controls)
- Mean age was 53 (standard deviation = 14) years, 58% were female, and 31% were employed (**Table 1**)

Health-Related Quality of Life

- After regression adjustment, mean EQ-5D-5L scores were significantly lower for patients with DG versus matched controls, with a mean difference of 0.06 (0.65 vs. 0.71; p=0.01) [**Figure 1**]
- Mean MCS and PCS scores were significantly lower for patients with DG versus matched controls, with mean differences of 2.91 (40.75 vs. 43.66; p=0.045) and 6.06 (37.58 vs. 43.64; p<0.001), respectively, after regression adjustment (**Figure 2A**)
- The mean SF-6D health utility score for patients with DG was also significantly lower than for matched controls, with a mean difference of 0.06 (0.59 vs. 0.65; p=0.001) [**Figure 2B**]

Work Productivity and Activity Impairment

- Compared with matched controls, patients with DG reported 2.02 times more presenteeism, 2.14 times greater overall work productivity loss, and 1.29 times greater daily activity impairment (all p<0.05) [**Figure 3**]

Indirect Costs

- Based on average overall work productivity loss, estimated total annual indirect costs were 5.96 times higher for patients with DG versus matched controls ($15,330 vs. $2,574; p=0.002)

Table 1. Demographics and Clinical Characteristics of Patients with DG and Matched Controls without Diabetes or Gastroparesis

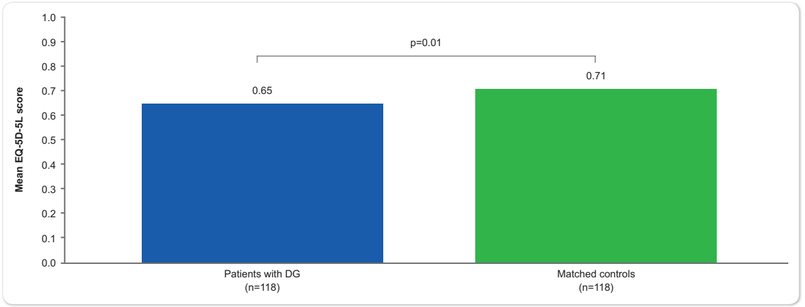
	Total (N=236)	Patients with DG (n=118)	Matched controls (n=118)	Standardized difference
Age category, years, n (%)				
18–34	26 (11)	11 (9)	15 (13)	0.11
35–44	33 (14)	19 (16)	14 (12)	0.12
45–54	66 (28)	31 (26)	35 (30)	0.08
55–64	60 (25)	33 (28)	27 (23)	0.12
>65	51 (22)	24 (20)	27 (23)	0.06
Female, n (%)	137 (58)	68 (58)	69 (58)	0.02
Race/ethnicity, n (%)				
Non-Hispanic White	144 (61)	69 (58)	75 (64)	0.10
Non-Hispanic Black	34 (14)	20 (17)	14 (12)	0.15
Hispanic	30 (13)	16 (14)	14 (12)	0.05
Other ethnicity	28 (12)	13 (11)	15 (13)	0.05
Education, n (%)				
Lower level of education than a 4-year college degree/declined to answer	138 (58)	67 (57)	71 (60)	0.07
4-year college degree or higher	98 (42)	51 (43)	47 (40)	–
Exercise, n (%)[a]				
1+ times	99 (42)	56 (47)	43 (36)	–
0 times	137 (58)	62 (53)	75 (64)	0.22
Drink alcohol, n (%)	104 (44)	58 (49)	46 (39)	0.21
Annual household income, n (%)				
<$25,000/declined to answer	104 (44)	48 (41)	56 (47)	0.14
$25,000–$49,999	61 (26)	34 (29)	27 (23)	0.14
$50,000–$74,999	28 (12)	15 (13)	13 (11)	0.05
⩾$75,000	43 (18)	21 (18)	22 (19)	0.02
Charlson Comorbidity Index score, mean (SD)	2.77 (2.57)	2.87 (2.20)	2.67 (2.89)	0.09
BMI category, kg/m^2, n (%)				
Underweight/unknown (<18.5)	4 (2)	3 (3)	1 (1)	0.13
Normal weight (18.5–<25)	42 (18)	20 (17)	22 (19)	0.04
Overweight (25–30)	63 (27)	33 (28)	30 (25)	0.06
Obese (>30)	127 (54)	62 (53)	65 (55)	0.05
Labor force participation, n (%)	73 (31)	39 (33)	34 (29)	0.09

[a]Frequency of exercise in the past week

Percentages may not equal 100 due to rounding

BMI, body mass index; DG, diabetic gastroparesis; SD, standard deviation

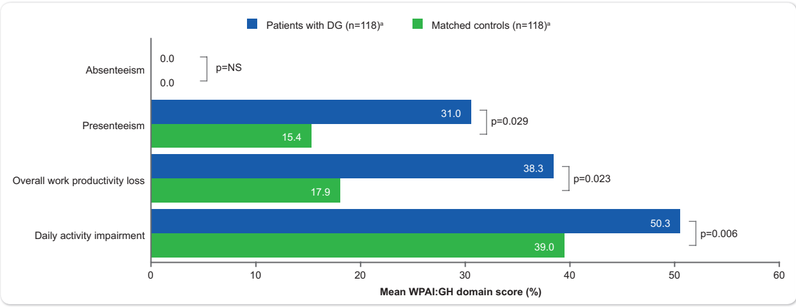
Figure 1. Mean EQ-5D-5L Scores among Patients with DG and Matched Controls



P values represent significance of the regression coefficient of patients with DG versus controls as the reference group. Covariates included ethnicity, exercise frequency, alcohol consumption, income, BMI, age, and geographic region

BMI, body mass index; DG, diabetic gastroparesis; EQ-5D-5L, 5 level EuroQoL 5 dimensions

Figure 3. Work Productivity and Activity Impairment among Patients with DG and Matched Controls

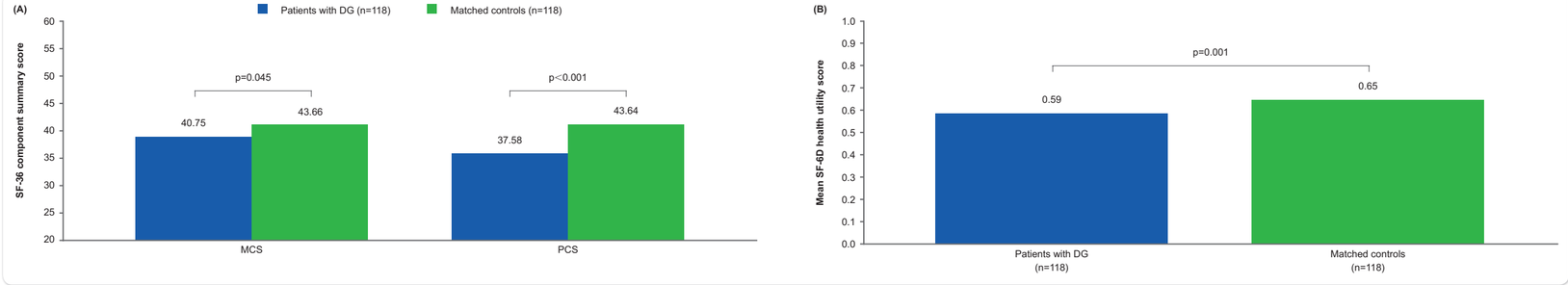


[a]Only respondents who reported being employed provided data for absenteeism, presenteeism, and overall work impairment. Absenteeism and overall work productivity loss: control n=32; DG n=36; presenteeism: control n=32; DG n=37.

P values represent significance of the regression coefficient of patients with DG versus controls as the reference group. Covariates included ethnicity, exercise frequency, alcohol consumption, income, BMI, age, and geographic region. For absenteeism, parameters may be inaccurate due to model convergence issues

BMI, body mass index; DG, diabetic gastroparesis; NS, not significant; WPAI:GH, Work Productivity and Activity Impairment Questionnaire: General Health

Figure 2. Mean SF-36 MCS and PCS Scores (A) and SF-6D Scores (B) among Patients with DG and Matched Controls



P values represent significance of the regression coefficient of patients with DG versus controls as the reference group. Covariates included ethnicity, exercise frequency, alcohol consumption, income, BMI, age, and geographic region. MCS and PCS scores are normalized to a mean of 50 and a standard deviation of 10 for the US population; higher scores indicate better HRQoL

BMI, body mass index; DG, diabetic gastroparesis; HRQoL, health-related quality of life; MCS, mental component summary; PCS, physical component summary; SF-36, Medical Outcomes Study 36-Item Short Form Health Survey Instrument version 2; SF-6D, Short Form-6 Dimensions

DISCUSSION

- Patients with DG in this population experienced, on average, significantly lower HRQoL and mental and physical well-being compared with matched controls based on mean scores for the EQ-5D-5L, MCS, PCS, and SF-6D
- Employed patients with DG in this population reported significantly higher levels of presenteeism and overall work productivity loss compared with matched controls, which translated to indirect costs of $12,756 more per employed patient per year for patients with DG in comparison with those without DG
- Patients with DG also reported greater daily activity impairment compared with both matched controls and the general US population average score of 22.1%[11]

Limitations

- As with any survey, the data are self-reported and cannot be verified by patients' medical charts or other objective data
- The data are cross-sectional in nature and do not allow for causal explanations to be made
- Although a number of respondent characteristics were controlled for, there may be additional variables that were not controlled for, potentially affecting the results
- Data extrapolated for cost analyses represent the most up-to-date information available as of the time of the study, and therefore represent a conservative estimate. However, this does not affect relative comparisons of costs across groups
- The present sample of patients with DG included in the analyzed dataset is small and was not based on sample size calculations but rather on availability of data. As such, many of the analyses conducted may be underpowered, suggesting that the present results are conservative and may underestimate the true burden of DG among patients in the US

INTRODUCTION

Background

- Diabetic gastroparesis (DG) is a complication of long-standing diabetes mellitus estimated to affect 5% and 1% of patients with type 1 and type 2 diabetes mellitus, respectively[1]
- Symptoms include abdominal pain, nausea, vomiting, postprandial fullness, early satiety, and bloating, which can have a significant impact on health-related quality of life (HRQoL) and work productivity[2,3]
- However, data quantifying the humanistic impact of DG are limited

Objective

- To assess the impact of DG on HRQoL, work productivity, activity impairment, and indirect costs among a sample of the US adult population

METHODS

Data Source

- This study was a cross-sectional patient survey based on data from the 2017 US National Health and Wellness Survey (N=75,004), a self-administered, internet-based general health questionnaire from a sample of adults aged ⩾18 years in the US
- Stratified random sampling was used to ensure that the demographic composition of the survey population was representative of the US adult population with respect to age, gender, and ethnicity, based on US census data

Sample Population

- Patients with DG were defined as those with self-reported physician diagnoses of both diabetes mellitus (type 1 or 2) and gastroparesis
- Matched controls included respondents without self-reported diagnoses of either diabetes mellitus or gastroparesis

Study Measures

- The survey included the following generic HRQoL and work productivity measures:
  - 5 level EuroQoL 5 dimensions (EQ-5D-5L)[4]
    - A measure of general health status consisting of five questions assessing five dimensions of health (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) used to define a health state for which a utility value can be derived from published algorithms.[5] A higher utility index indicates better HRQoL
    - Measured on a 0–1 scale, with a minimal important difference of approximately 0.05 points[6]
  - Medical Outcomes Study 36-Item Short Form Health Survey Instrument version 2[7,8]
    - Two summary component scores (i.e. physical component summary [PCS] and mental component summary [MCS] scores) were calculated as norm-based scores ranging from 0 to 100 (US normative mean=50, standard deviation=10), with higher scores indicating better HRQoL
    - Health utilities were derived by applying the Short Form-6 Dimensions (SF-6D) algorithm, a health state classification measure ranging from 0.0 (death) to 1.0 (best possible health state)
  - Work Productivity and Activity Impairment Questionnaire: General Health version (WPAI:GH)[9,10]
    - A measure of the impact of general health problems on patients' ability to work and perform daily activities, consisting of six items measuring four domains:
      - Absenteeism
      - Presenteeism
      - Overall work productivity loss
      - Daily activity impairment
    - All domain scores are expressed as percentages, with higher percentages indicating greater work productivity loss and activity impairment

Statistical Analyses

- A propensity scoring approach was used to create a 1:1 match between patients with DG and controls
- Scores for the WPAI:GH were calculated as follows:
  - Absenteeism = (hours missed due to health problems / [hours missed due to health problems + hours worked]) × 100
  - Presenteeism = (degree health affected productivity while working / 10) × 100
  - Overall work productivity loss = (absenteeism + [hours worked × presenteeism]) × 100
  - Daily activity impairment = (degree health affected daily activities / 10) × 100
- Estimated annual indirect costs were calculated for each employed respondent by extrapolating data from the Bureau of Labor Statistics to apply as unit costs to work productivity variables (absenteeism and presenteeism) from the WPAI:GH
- Generalized linear models were used to examine differences in health outcomes between patients with DG and controls, adjusting for variables that remained unbalanced between groups post-match (i.e. age, ethnicity, exercise, alcohol consumption, income, body mass index, and geographic region)
- Differences were considered significant at p<0.05

DISCLOSURES

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References

1. Choung RS et al. Am J Gastroenterol 2012; 107: 82–88
2. Camilleri M et al. Am J Gastroenterol 2013; 108: 18–37
3. Jaffe JK et al. J Clin Gastroenterol 2011; 45: 317–321
4. EuroQol Group. Health Policy 1990; 16: 199–208
5. Dolan P. Med Care 1997; 35: 1095–1108
6. McClure NS et al. Value Health 2017; 20: 644–650
7. Ware J, Jr. et al. Med Care 1996; 34: 220–233
8. Ware JE, Jr., Sherbourne CD. Med Care 1992; 30: 473–483
9. Reilly MC et al. Ailment Pharmacol Ther 2004; 20: 459–467
10. Reilly MC, Zbrozek AS, Pharmacoeconomics 1992; 2: 54–66
11. Witt EA, DiBonaventura MD. Poster PRS40 presented at the ISPOR 20th Annual International Meeting, Philadelphia, PA, USA, May 16–20, 2015

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