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The socioeconomic impact on presentation and clinical course of celiac disease

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Introduction

- Celiac Disease (CD) is a chronic autoimmune condition primarily affecting the small intestine
- CD is triggered by ingestion of gluten and the only effective treatment for CD involves strict and lifelong elimination of dietary gluten.
- Compliance with the gluten free diet (GFD) relies on purchasing gluten-free foods. Studies have shown the cost of a GFD to be from 76% to 518% more expensive than gluten containing counterparts. Because of this, the economic burden that CD patients face may be substantial, placing these patients at high risk for dietary neglect.
- Financial limitation aside, GFD availability also varies by differing neighborhoods, resulting in economic food deserts across the country.

Aims

- Determine whether household income affects the presentation of celiac disease and gluten free diet (GFD) adherence as well as time to mucosal healing

Methods

- A single center retrospective chart review
- Cohorts were categorized as low income (LI), medium income (MI), and high income (HI)
- Primary outcomes: histologic and laboratory markers of CD activity at initial presentation and follow-up
- Secondary outcomes: GFD adherence, initial presentation and time to mucosal healing

Demographic Information

Number of Patients	193
Gender, n = 193	Female 149 (77.2%) Male 44 (22.8%)
Average Age at Presentation (Years)	Mean: 39.3; Std Dev: 15.6 Median: 40; Q1-Q3: 26-51
Ethnicity, n = 193	Caucasian 144 (74.6%) African American 2 (1.1%) Hispanic 1 (0.5%) Asian 0 (0%) Unknown/Undisclosed 46 (23.8%)
Mean BMI (kg/m ²)	Mean: 27.6 ; Std Dev: 12.7 Median: 24.8; Q1-Q3: 21.9-32.2
Median Household Income (\$ USD)	Median: \$77,500; Q1-Q3: \$61754-10,0729

Results

	Low Household Income (1 st to 49 th percentile)	Medium Household Income (50 th -70 th percentile)	High Household Income (70 th -99 th Percentile)	P-value
Number of Patients	49	95	49	
Median Household Income (\$ USD) (median; Q1-Q3)	50,162; 42,418-56,018	77,500; 73,231-92,137	117,488; 106,934-126,705	
Age at Presentation (yrs) (mean; st dev)	39.8; 17.0	39.5; 15.7	38.4; 13.9	p = 0.961
BMI at Presentation (kg/m ²) (median; Q1-Q3)	24.8; 22.4-30.1	24.5; 21.6-30.2	25.7; 23.1-33.0	p = 0.591
Hemoglobin at Presentation (g/dL) (mean; st dev)	12.9; 1.5	13.5; 1.3	14.8 ; 5.9	p = 0.372
Cholesterol at Presentation (mg/dL) (mean; st dev)	196.5; 55.9	166.7; 40.7	172.4; 36.8	p = 0.704
GI Symptom Present at Initial Visit (%)	37 (88.1%)	80 (87.9%)	38 (90.5%)	p = 0.952
Adherence to GFD	Always adherent 31 (72.1%) Somewhat adherent 5 (11.6%) Never adherent 7 (16.3%)	Always adherent 58 (67.4%) Somewhat adherent 24 (27.9%) Never adherent 4 (4.7%)	Always adherent 34 (87.2%) Somewhat adherent 5 (19.2%) Never adherent 0 (0.0%)	p = 0.005
Time to Mucosal Healing (months) (median; Q1-Q3)	64; 48-99	35; 24-48	32 ; 19-61.5	p = 0.273
Marsh Classification at Diagnosis	Class 0 3 (10.7%) Class 1 6 (21.4%) Class 2 1 (3.6%) Class 3A 7 (25%) Class 3B 7 (25%) Class 3C 4 (14.3%)	Class 0 3 (4.8%) Class 1 11 (17.7%) Class 2 2 (3.6%) Class 3A 19 (30.6%) Class 3B 20 (32.3%) Class 3C 7 (11.3%)	Class 0 2 (7.1%) Class 1 8 (28.6%) Class 2 1 (3.6%) Class 3A 8 (28.6%) Class 3B 8 (28.6%) Class 3C 1 (3.6%)	p = 0.909
Marsh Classification at Repeat EGD	Class 0 17 (48.6%) Class 1 9 (25.7%) Class 2 0 (0.0%) Class 3A 4 (11.4%) Class 3B 3 (8.6%) Class 3C 2 (5.7%)	Class 0 21 (36.2%) Class 1 17 (29.3%) Class 2 3 (5.2%) Class 3A 12 (20.7%) Class 3B 4 (6.9%) Class 3C 1 (1.7%)	Class 0 17 (60.7%) Class 1 7 (25.0%) Class 2 0 (0.0%) Class 3A 3 (10.7%) Class 3B 1 (3.6%) Class 3C 0 (0.0%)	p = 0.532
Normalization of TTG IGA	Yes 9 (69.2%) No 4 (30.8%) Always normal 3	Yes 18 (72.0%) No 7 (28.0%) Always normal 13	Yes 11 (84.6%) No 2 (15.4%) Always normal 8	p = 0.616

- GFD **non-adherence** was self-reported to be highest in LI cohort (16.3% in LI; 4.7% in MI, 0.0% in HI).
- HI cohort reported the highest rate of always being adherent to GFD (72.1% in LI; 67.4% in MI; 87.2% in HI).
- Intermittent adherence to GFD was highest in the MI cohort (11.6% in LI; 27.9% in MI; 19.2% in HI).

Conclusion

Income was found to effect adherence to the GFD but there was no significant difference in presentation, disease severity or time to normalization of TTG IgA or mucosal healing in patients with celiac disease.