The economic burden of chronic idiopathic constipation in the US: a systematic literature review

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BACKGROUND AND OBJECTIVES

- Chronic idiopathic constipation (CIC) is a functional gastrointestinal disorder characterized by symptoms of difficult, infrequent or incomplete defecation.[1]
- The prevalence of CIC in the US is 4–20%.[2,3]
- This systematic review aimed to evaluate the healthcare resource use (HCRU), direct costs, indirect costs, and utilities associated with CIC in the US, and the cost-effectiveness of prescription drugs for CIC in the US.

METHODS

- Electronic databases (PubMed, Embase, the Cochrane Library, EconLit, and the Cumulative Index to Nursing and Allied Health Literature) were searched for English-language articles reporting the economic burden of CIC, utilities associated with CIC, or the cost-effectiveness of prescription drugs for CIC in the US that were published between January 1, 2006 and March 1, 2017.
  - Key search terms for the population of interest included: 'chronic idiopathic constipation' and 'functional constipation'.
  - Key search terms for studies of interest included: 'economic evaluation', 'cost', 'resource use', 'indirect cost', and 'utility'.
  - Congress abstracts were limited to those published between January 1, 2015 and March 1, 2017.
- Studies were included if they met all the following criteria:
  - The study population comprised adult patients aged 18 years or older with CIC or functional constipation.
  - Outcomes included HCRU, utilities, cost-effectiveness results, direct costs, and indirect costs or measures of lost productivity.
  - Data were from US-based economic models or prospective, retrospective or cross-sectional studies.
- Reference lists from systematic reviews were used to identify primary articles. Systematic reviews were then excluded.

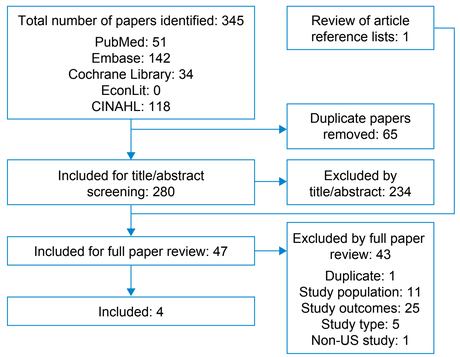
RESULTS

- A total of 345 papers and 1 record from a review of reference lists were identified for screening (Figure 1).
  - Of these, four papers met the inclusion criteria (Table 1).

HCRU and costs

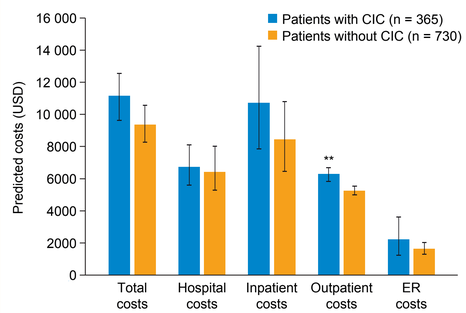
- Three studies reported HCRU and costs associated with CIC in the US.
- Of these, one study compared the costs for hospital, inpatient, outpatient, and emergency room visits in patients with CIC with age- and sex-matched individuals without CIC over 2 and 10 years.[4]
  - Overall, no significant differences in total costs were found between patients with CIC and those without CIC over 2 and 10 years.[4]
  - However, outpatient costs were significantly higher for patients with CIC than those without CIC over 2 years ($6284 vs $5254, respectively; $p < 0.05$; Figure 2).

Figure 1: Flow diagram of study selection



CINAHL, Cumulative Index to Nursing and Allied Health Literature.

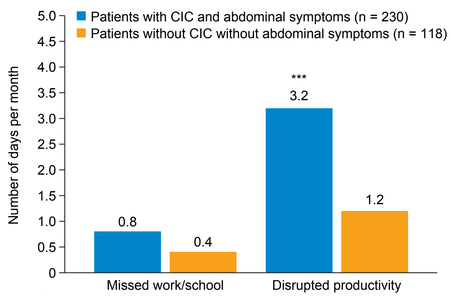
Figure 2: Mean predicted costs (2007–2008) for patients with CIC and matched controls



**$p < 0.05$
Data source: Herrick *et al.* 2017[4]
CIC, chronic idiopathic constipation; ER, emergency room; USD, United States dollar.

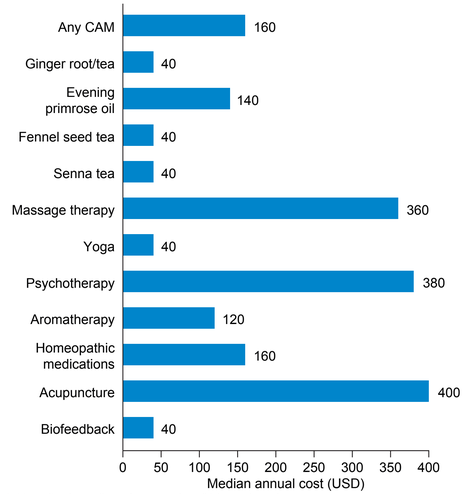
- The second study reported that patients with CIC and abdominal symptoms experienced a significantly higher number of days per month of disrupted productivity over 12 months than those with CIC without abdominal symptoms (3.2 vs 1.2, respectively; $p < 0.001$; Figure 3).[5]
  - Abdominal symptoms included abdominal pain, abdominal discomfort, stomach cramping, and/or bloating.[5]
  - A significantly greater proportion of patients with CIC and abdominal symptoms sought physician care over 12 months than those with CIC without abdominal symptoms (43.3% vs 33.9%, respectively; $p < 0.04$).[5]
  - In addition, patients with CIC and abdominal symptoms missed a higher number of days of work/school per month than those with CIC without abdominal symptoms (0.8 vs 0.4, respectively; p = not significant; Figure 3).[5]
- The third study reported that 32.1% of patients with CIC (n = 51/159) incurred costs from the use of complementary and alternative medicines (CAMs), which ranged from $40 to $400 per year (Figure 4).[6]
  - The most expensive CAM identified was acupuncture, with a median annual cost of $400 (Figure 4).[6]
  - Ginger root/tea was the most frequently used CAM; 16.4% of patients with CIC (n = 26/159) had used this in the past 3 months.[6]

Figure 3: Mean number of days per month of missed work/school and disrupted productivity in patients with CIC with or without abdominal symptoms



***$p < 0.001$
Data source: Heidelbaugh *et al.* 2015[5]
CIC, chronic idiopathic constipation.

Figure 4: Median annual costs of complementary and alternative medicines used by patients with CIC



CAMs are listed according to frequency of use (highest to lowest).
Data source: Van Tilburg *et al.* 2008[6]
CAM, complementary and alternative medicine; CIC, chronic idiopathic constipation; USD, United States dollar.

Table 1: Overview of articles included

Study	Study type	Parameters investigated	Study objective	Data source(s)	Study duration	Number of patients with CIC/functional constipation
[4]Herrick LM *et al. Am J Med Econ* 2017;20:273–9	Population-based retrospective study	HCRU Direct costs	To describe HCRU and compare medical costs for patients with CIC and matched controls without CIC	EMR Patient survey Health insurance fee schedule	2 years and 10 years	365
[5]Heidelbaugh JJ *et al. Am J Gastroenterol* 2015;110:580–7	Population-based cross-sectional survey	HCRU Direct costs	To characterize symptom and disease burden in patients with CIC with or without abdominal symptoms	Patient survey	1 year	552
[6]Van Tilburg MA *et al. BMC Complement Altern Med* 2008;24:46	Prospective survey	HCRU Indirect costs	To determine the prevalence, types, and costs of complementary and alternative medicine in patients with CIC	EMR Patient survey Administrative claims at HMO	6 months	159
[7]Huang H *et al. Manag Care* 2016;25:41–8*	Cost-utility analysis using a decision-tree model	Cost-effectiveness	To evaluate the cost-effectiveness of linaclotide compared with lubiprostone	Clinical trial data Physician survey Health insurance fee schedule	4 weeks	1000

*Study involved the development of a cost-effectiveness model: study duration refers to the modeled time horizon; the number of patients with CIC/functional constipation refers to the number of simulated patients.
CIC, chronic idiopathic constipation; EMR, electronic medical records; HCRU, healthcare resource use; HMO, health maintenance organization.

Cost-effectiveness of treatment for CIC

- One study investigated the cost-effectiveness of lubiprostone (24 µg twice daily) compared with linaclotide (145 µg once daily) for the treatment of CIC in the US using a decision-tree model.[7]
  - When treatment response was based on a global assessment of treatment efficacy, a lower direct cost per patient was reported for linaclotide ($946) than for lubiprostone ($1015).
  - When treatment response was based on the frequency of spontaneous bowel movements, a lower direct cost per patient was reported for linaclotide ($727) than for lubiprostone ($737).
  - Quality-adjusted life-years (QALYs) were the same for both treatments (0.07) irrespective of response basis.[7]

LIMITATIONS

- Only a small number of studies met the inclusion criteria, making it difficult to draw firm conclusions on the economic burden of CIC or the cost-effectiveness of prescription drugs for CIC in the US based on this review.
- Available data from the included studies could not be pooled owing to variability in the analyses performed and the data presented.

CONCLUSIONS

- Available data suggest that US patients with CIC have higher HCRU and direct costs than individuals without CIC.
  - In addition, patients with CIC often incur costs from CAMs.
- Lower productivity and higher work/school absenteeism have been reported in patients with CIC and abdominal symptoms than in those with CIC without abdominal symptoms.
  - No studies comparing indirect costs in patients with CIC and individuals without CIC were identified, suggesting a gap in these data.
- One study on the cost-effectiveness of prescription drugs for CIC in the US was identified.
  - Linaclotide was reported to be less costly than lubiprostone; QALYs were the same for both treatments.
- No health utility studies in the US were identified.

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DISCLOSURES

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