International Journal of Advances in Medicine
*Kumar R et al. Int J Adv Med. 2023 Oct;10(10):695-704*
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: https://dx.doi.org/10.18203/2349-3933.ijam20232834

**Original Research Article**

# Chronic constipation with associated comorbid conditions: a physician survey on clinical perspectives on its diagnosis and management

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**Received:** 25 July 2023
**Accepted:** 02 September 2023

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## ABSTRACT

**Background:** This survey aimed to investigate physicians' perspectives on chronic constipation in patients with comorbidities, diagnosis and management of CC, and preferred laxatives used for treating CC in these patients.
**Methods:** A 32-item, questionnaire-based online survey was conducted among 243 consulting physicians to gather information about CC with comorbidities, diagnosis and management strategies, and preferred laxatives.
**Results:** The survey showed that 10%-39% of patients experienced CC for >3 months as reported by 61.7% of physicians, with diabetes being the most common comorbid condition. Patient noncompliance (93.8%) was identified as the main factor affecting management outcomes. The most preferred laxative by physicians in adult patients and the elderly was the combination of liquid paraffin+MOM+sodium picosulfate. The primary parameters considered by physicians when choosing a laxative were efficacy and tolerability. The laxative containing liquid paraffin + MOM + sodium picosulfate was reported to be effective for overnight relief by 44.9% of physicians in 60%-89% of patients. Physicians largely opined that side effects such as nausea/vomiting, abdominal cramps/pain, and anal seepage/ incontinence occurred in <1% of patients treated with liquid paraffin+MOM+sodium picosulfate.
**Conclusions:** Clinical features aid in diagnosing CC and physicians prioritize treatment effectiveness when selecting laxatives. The participating physicians opined that combination laxatives consisting of liquid paraffin+MOM+sodium picosulfate are effective and well-tolerated for managing CC in patients with comorbidities. Hence, it is essential to consider their use for effective management of CC with comorbidities.

**Keywords:** Chronic constipation, Comorbidities, Laxatives, Liquid paraffin, Milk of magnesia, Sodium picosulfate

## INTRODUCTION

Chronic constipation (CC) is a prevalent issue in medical practice globally with the prevalence estimates for the condition ranging from 2% to 24% in the Western world.[1,2] In spite of the scarcity of data, available studies indicate CC to be a common health problem in India.[3] Experts in the country have held the view that epidemiology, clinical features, diagnosis, treatment requirements, and patient expectations differ somewhat from those in the Western world, but there has been a lack of supporting data.[1] The definition of CC varies among patients and physicians, as well as among different physicians, leading to inconsistent prevalence rates reported in various epidemiological studies.[4]

However, the presence of symptoms such as infrequent, difficult, or incomplete defecation that persist for a significant period and prompt the patient to seek medical attention may suggest the presence of CC.[1]

The Rome criteria are considered the gold standard for diagnosing CC, as they provide a clinical definition of constipation based on both objective and subjective clinical symptoms. First introduced in 1994 as the Rome I criteria, they have since undergone several revisions.[5,6] CC often manifests as a secondary symptom in a range of conditions, including neurological and metabolic disorders, anorectal disorders, and as a result of surgery. Additionally, medications prescribed for treating various chronic medical conditions may contribute to the development of constipation.[7] German Chronic Constipation (GECCO) study reported a high prevalence of putative CC, which was found in 62.9% of cases.[8]

Constipation is not a natural consequence of ageing, but its prevalence tends to increase among older adults due to a combination of various factors. These include decreased mobility, medications, underlying medical conditions, and rectal sensory-motor dysfunction.[9] The precise prevalence of constipation is unknown, but approximately 2% of the population experiences persistent and recurring constipation, with a higher prevalence in women than in men. Self-reported constipation rates range from 24% to 37% in the general population. Among institutionalized elderly individuals, up to 50% report constipation, and up to 74% use laxatives regularly.[10] Performing a detailed medical history and physical examination, including a digital rectal examination, is crucial to identify any evacuation disorder that may be contributing to constipation. Additionally, physiological tests like colonic transit assessment, anorectal manometry, and the balloon expulsion test can aid in categorizing patients into different subtypes of constipation for appropriate management.[11]

Most patients with CC receive non-operative treatment that typically involves lifestyle modifications, pharmacotherapy, and biofeedback therapy.[2] Effective educational interventions and self-management programs, which focus on medication management and counselling, can further improve treatment outcomes, including clinical, humanistic, adherence, and cost outcomes.[12] According to current practice guidelines based on consensus in India, the initial treatment for CC involves lifestyle changes and osmotic laxatives.[3] However, the evidence supporting the use of laxatives for constipation remains weak. The aim of this survey was to investigate Indian physicians' perspectives on CC in patients with comorbid conditions, as well as to explore physicians' opinions on the diagnosis and management of CC and preferred laxatives used for treating CC.

## METHODS

### *Survey questionnaire*

The purpose of this questionnaire-based survey was to investigate the Indian clinicians' opinions on the clinical features, diagnosis, management, and role of the combination laxative containing liquid paraffin, milk of magnesia (MOM) and sodium picosulfate in the treatment of CC with comorbid conditions. Physicians involved in the clinical practice of chronic constipation management were approached to participate in the survey. The internet-based, structured survey questionnaire consisted of 32 questions (Table 1) and was conducted from October 2022 to December 2022 in accordance with International conference on harmonization-good clinical practice (ICH-GCP) guidelines, with informed consent obtained from participating physicians and confidentiality maintained throughout the survey and data processing. As the survey did not involve direct patient intervention, independent ethics review board clearance was not sought.

**Table 1: Survey questionnaire.**

| Sections | Questions |
|---|---|
| **Section 1** | **Clinical features and diagnosis of chronic constipation with associated comorbid conditions in the Indian population** |
| Q1 | How many patients have complaints of constipation for >3 months? (Total to be 100%) |
| | a) <9%, b) 10%-39%, c) 40%-79%, d) ≥80% |
| Q2 | In your clinical practice, what is the most common age group you see suffering from chronic constipation? |
| | a) ≤19 years, b) 20-39 years, c) 40-59 years, d) ≥60 years |
| Q3 | What are the most common symptoms patients complain about when suffering from chronic constipation? (Rank in order of preference, 1 = most common, 2 = common, 3 = average; 4 = less common, 5 = least common) |
| | a) Strain/sense of difficulty while passing stools, b) Feeling of incomplete evacuation, c) Hard stools, d) Prolonged time to defecate, e) Need for manual maneuvers to pass stools |
| Q4 | How do you diagnose patients with chronic constipation? (Rank in order of preference, 1 = most common, 2 = common, 3 = average; 4 = less common, 5 = least common) |
| | a) Clinical features, b) ROME IV criteria, c) Contrast-enhanced computed tomography, d) Colonoscopy, e) Proctological examination |
| Q5 | Do you see patients with constipation symptoms associated with the following diseases? |
| | a) Diabetes mellitus (Yes/No), b) Hypertension (Yes/No), c) Thyroid disorders (Yes/No), d) Any other |
| Q6 | What percentage of patients with diabetes suffer from chronic constipation? |

Continued.

| Sections | Questions |
|---|---|
| | a) <19%, b) 20%-39%, c) 40%-59%, d) 60%-79%, e) ≥80% |
| Q7 | What percentage of patients with hypertension suffer from chronic constipation? |
| | a) <19%, b) 20%-39%, c) 40%-59%, d) 60%-79%, e) ≥80% |
| Q8 | What percentage of patients with thyroid disorder suffer from chronic constipation? |
| | a) <19%, b) 20%-39%, c) 40%-59%, d) 60%-79%, e) ≥80% |
| **Section 2** | **Management of chronic constipation associated with comorbid conditions and preference of laxatives in these patients** |
| Q9 | Do you educate patients suffering from chronic constipation associated with comorbid conditions on lifestyle modifications? |
| | a) Yes, b) No |
| Q10 | Do the following factors affect outcomes in the management of chronic constipation patients with comorbid conditions? |
| | a) Patient adherence/noncompliance issue (Yes/No), b) Treatment response rates (Yes/No), c) Lack of treatment options (Yes/No), d) Managing treatment-related side-effects e.g. diarrhea and others (Yes/No) |
| Q11 | What are the most important parameters for choosing a laxative for patients with chronic constipation? (Rank in order of preference, 1 = most common, 2 = common, 3 = average; 4 = less common, 5 = least common) |
| | a) Efficacy, b) Tolerability, c) Price, d) Availability, e) Dosage form |
| Q12-13 | In your clinical practice, which among the following laxatives is the most preferred for chronic constipation relief in Q12) adult population and Q13) elderly patients? (Rank in order of preference: 1 = most common, 2 = common, 3 = average; 4 = less common, 5 = least common) |
| | a) Bulk laxatives (e.g., Ispaghula), b) Osmotic laxatives (e.g., polyethylene glycol 3350, lactulose), c) Stimulant laxatives (e.g., sodium picosulfate, bisacodyl), d) Lubricant laxatives (e.g., liquid paraffin), e) Combinations (e.g., sodium picosulfate+liquid paraffin+milk of magnesia), f) Ayurvedic preparations |
| Q14-18 | Which is/are the most preferred laxatives for chronic constipation used in Q14) adult patients, Q15) elderly patients (i.e., more than 65 years of age), Q16) patients with diabetes, Q17) patients with hypertension, and Q18) patients with thyroid disorders? (Rank in order of preference, 1 = most common, 2 = common, 3 = average; 4 = less common, 5 = least common) |
| | a) Lactulose, b) Lactulose + fibers, c) Polyethylene glycol + electrolytes, d) Sodium picosulfate, e) Liquid paraffin + milk of magnesia, f) Liquid paraffin + milk of magnesia + sodium picosulfate, g) Prucalopride, h) Bisacodyl, i) Any other |
| **Section 3** | **Efficacy of liquid paraffin + milk of magnesia + sodium picosulfate in patients with chronic constipation and associated comorbid conditions** |
| Q19 | As per your clinical practice experience, which among the following laxative options, do you feel help in most rapid relief from chronic constipation associated with comorbid conditions? |
| | a) Lactulose, b) Lactulose + fibers, c) Polyethylene glycol + electrolytes, d) Sodium picosulfate, e) Liquid paraffin + milk of magnesia, f) Liquid paraffin + milk of magnesia + sodium picosulfate, g) Prucalopride, h) Bisacodyl, i) Any other |
| Q20 | What percentage of patients get overnight relief after taking liquid paraffin + milk of magnesia + sodium picosulfate from chronic constipation associated with comorbid conditions? |
| | a) ≤29%, b) 30%-59%, c) 60%-89%, d) ≥90% |
| Q21 | As per your clinical practice experience, which among the following laxative options, do you feel help in both evacuation and relief of bloating? |
| | a) Lactulose, b) Lactulose + fibers, c) Polyethylene glycol + electrolytes, d) Sodium picosulfate, e) Liquid paraffin + milk of magnesia, f) Liquid paraffin + milk of magnesia + sodium picosulfate, g) Prucalopride, h) Bisacodyl, i) Any other |
| Q22 | In your clinical practice, how will you rank the overall efficacy of liquid paraffin + milk of magnesia + sodium picosulfate for managing chronic constipation associated with comorbid conditions? |
| | a) Excellent, b) Good, c) Average, d) Poor |
| **Section 4** | **Tolerability of liquid paraffin+milk of magnesia+sodium picosulfate in patients with symptoms of chronic constipation and associated comorbid conditions** |
| Q23 | What percentage of patients do you see having nausea/vomiting after taking liquid paraffin + milk of magnesia + sodium picosulfate? |
| | a) ≤1%, b) 1%-5%, c) 5%-10% |
| Q24 | What percentage of patients do you see having abdominal cramps/pain after taking liquid paraffin + milk of magnesia + sodium picosulfate? |
| | a) ≤1%, b) 1%-5%, c) 5%-10% |

Continued.

| Sections | Questions |
|---|---|
| Q25 | What percentage of patients do you see having watery/loose stools after taking liquid paraffin + milk of magnesia + sodium picosulfate? |
| | a) ≤1%, b) 1%-5%, c) 5%-10%, d) 10%- 15% |
| Q26 | What percentage of patients do you see having anal seepage/incontinence after taking liquid paraffin + milk of magnesia + sodium picosulfate? |
| | a) ≤1%, b) 1%-5%, c) 5%-10%, d) 10%- 15% |
| Q27 | In your clinical practice, will you rank the overall tolerability of liquid paraffin + milk of magnesia + sodium picosulfate for managing chronic constipation associated with comorbid conditions? |
| | a) Excellent, b) Good, c) Average, d) Poor |
| Q28 | Have you observed any drug-drug interactions with liquid paraffin + milk of magnesia + sodium picosulfate in your experience? |
| | a) No, b) Yes |
| Q29 | In your clinical practice, how is your experience in terms of the patients' convenience and acceptability of liquid paraffin + milk of magnesia + sodium picosulfate for managing chronic constipation associated with comorbid conditions? |
| | a) Excellent, b) Good, c) Average, d) Poor |
| Q30 | Do you feel individualized dose titration is necessary while prescribing liquid paraffin + milk of magnesia + sodium picosulfate in chronic constipation patients associated with comorbid conditions? |
| | a) Yes, b) No |
| Q31 | What in your opinion should be the daily recommended dose of liquid paraffin + milk of magnesia + sodium picosulfate in adult patients with chronic constipation? |
| | a) 5 ml, b) 10 ml, c) 15 ml, d) 20 ml |
| Q32 | For what duration in your opinion can liquid paraffin + milk of magnesia + sodium picosulfate be given safely to adult patients suffering from chronic constipation associated with comorbid conditions? |
| | a) 1-2 weeks, b) 2-3 weeks, c) 3-4 weeks, d) >4 weeks |

### *Statistical analysis*

The data were summarized using counts/percentages where appropriate. To analyze rank data, a weighted linear combination method was used, which determined the most preferred choice for each question. The weight of the most preferred choice (ranked as 1) was the largest, while the weight of the least preferred choice (ranked last) was 1, with fixed weights within a question. The statistical analyses were conducted using SPSS software version 25.0 (IBM Corp., Armonk, NY, USA) and Microsoft Excel (Microsoft Corporation 2019).

## RESULTS

### *Physicians' perspectives on clinical features, and diagnosis of CC with comorbidities in clinical practice*

A total of 243 physicians participated in the questionnaire-based survey on CC with comorbidities. Among the participants, 61.7% reported that constipation was present in 10%-39% of their patients for more than 3 months. Meanwhile, 25.9%, 9.9% and 2.5% reported its presence in 40%-79%, <9%, and ≥80% of their patients, respectively (Table 2). In the survey, 54.3% of physicians reported that the age group of 40-59 years was the most commonly affected by CC with comorbidities, while 37.4% of physicians reported that the most vulnerable group was ≥60 years. According to 96.7% of physicians, constipation symptoms were associated with diabetes mellitus. Other comorbidities were thyroid disorders and hypertension as reported by 88.5% and 72.4% of physicians, respectively. Among the surveyed physicians, 42.8% reported that CC was present in 20%-39% of patients with diabetes, 39.9% reported that CC was present in <19% of patients with hypertension, and 35.8% reported that CC was present in 20%-39% of patients with thyroid disorders (Table 2). According to 179 physicians, the most common method for diagnosing CC patients was based on clinical features, followed by ROME IV criteria as reported by 39 physicians, proctological examination reported by 21 physicians, colonoscopy by 11 physicians, and contrast-enhanced computed tomography by 10 physicians. According to 98 physicians, the most common symptom of CC was strain or sense of difficulty while passing stools, followed by feeling of incomplete evacuation as reported by 82 physicians, hard stools reported by 57 physicians, prolonged time to defecate reported by 36 physicians, and the need for manual maneuvers to pass stools reported by 11 physicians.

### *Physicians' perspectives on the management of CC associated with comorbidities in clinical practice*

Majority of the physicians (98.8%) provided lifestyle modification education to CC patients with comorbidities. Most physicians (93.8%) identified patient adherence or noncompliance as the main factor affecting management outcomes, followed by response rates to treatment (90.5%), treatment side effects (81.5%), and lack of treatment options (53.1%) (Table 2).

**Table 2: Profiles of patients with CC and comorbidities and factors affecting management outcomes (n=243).**

| Parameters | | | | | N (%) |
|---|---|---|---|---|---|
| **Constipation as a symptom for more than 3 months (%)** | | | | | |
| <9 | | | | | 24 (9.9) |
| 10-39 | | | | | 150 (61.7) |
| 40-79 | | | | | 63 (25.9) |
| ≥80 | | | | | 6 (2.5) |
| **Age group of patients with CC (years)** | | | | | |
| ≤19 | | | | | 2 (0.8) |
| 20-39 | | | | | 18 (7.4) |
| 40-59 | | | | | 132 (54.3) |
| ≥ 60 | | | | | 91 (37.4) |
| **Comorbidity in patients with CC** | | | | | |
| Diabetes | | | | | 235 (96.7) |
| Hypertension | | | | | 176 (72.4) |
| Thyroid disorders | | | | | 215 (88.5) |
| Any other | | | | | 111 (45.7) |
| **Association of CC symptoms with type of comorbidity** | **<19%** | **20%-39%** | **40%-59%** | **60%-79%** | **≥80%** |
| Diabetes | 22 (9.1) | 104 (42.8) | 88 (36.2) | 28 (11.5) | 1 (0.4) |
| Hypertension | 97 (39.9) | 78 (32.1) | 54 (22.2) | 13 (5.3) | 1 (0.4) |
| Thyroid disorders | 52 (21.4) | 87 (35.8) | 67 (27.6) | 35 (14.4) | 2 (0.8) |
| **Factors affecting management outcomes** | | | | | |
| Patient adherence/noncompliance | | | | | 228 (93.8) |
| Treatment response rates | | | | | 220 (90.5) |
| Lack of treatment options | | | | | 129 (53.1) |
| Treatment related side-effects | | | | | 198 (81.5) |

**Table 3: Physicians' perspectives on rapid relief and relief from evacuation and bloating provided by various laxatives.**

| Proportion of physicians, Frequency (%) | Rapid relief, N=245 | Evacuation/bloating, N=243 |
|---|---|---|
| **Lactulose** | 42 (17.3) | 15 (6.2) |
| **Lactulose + fibers** | 53 (21.8) | 45 (18.5) |
| **Polyethylene glycol + electrolytes** | 15 (6.2) | 13 (5.3) |
| **Sodium picosulfate** | 9 (3.7) | 11 (4.5) |
| **Liquid paraffin + milk of magnesia** | 19 (7.8) | 30 (12.3) |
| **Liquid paraffin + milk of magnesia and sodium picosulfate** | 99 (40.7) | 123 (50.6) |
| **Prucalopride** | 2 (0.8) | 4 (1.6) |
| **Bisacodyl** | 2 (0.8) | 0 (0.0) |
| **Any other** | 2 (0.8) | 2 (0.8) |

**Table 4: Physicians' perspectives on efficacy and tolerability of liquid paraffin + milk of magnesia + sodium picosulfate in CC with comorbidities (n=243).**

| Proportion of physicians | N (%) | | | | |
|---|---|---|---|---|---|
| **Proportion of patients** | **≤29%** | **30%-59%** | **60%-89%** | **≥90%** | **-** |
| Overnight relief | 22 (9.1) | 74 (30.5) | 109 (44.9) | 38 (15.6) | - |
| **Proportion of patients** | **≤1%** | **1%-5%** | **5%-10%** | **10%-15%** | **Missing data** |
| Nausea/vomiting | 117 (48.1) | 115 (47.3) | 10 (4.1) | - | 1 (0.4) |
| Abdominal cramps/pain | 113 (46.5) | 105 (43.2) | 24 (9.9) | - | 1 (0.4) |
| Watery/loose stools | 54 (22.2) | 106 (43.6) | 63 (25.9) | 19 (7.8) | 1 (0.4) |
| Anal seepage/incontinence | 130 (53.5) | 85 (35.0) | 24 (9.9) | 3 (1.2) | 1 (0.4) |

When choosing laxatives for patients with CC, physicians ranked efficacy as the most important factor, followed by tolerability, availability, dosage form, and price. The (Figure 1) shows the preferences of survey physicians for various laxative types by type of patient population. Combination laxatives were most preferred followed by osmotic laxatives and bulk laxatives in adult patients as well as the elderly. With regard to specific laxative types, the most preferred laxative by physicians in adult patients and the elderly was the combination of liquid paraffin+ MOM and sodium picosulfate. For patients with diabetes as well, a combination of liquid paraffin+MOM+ sodium picosulfate was most preferred, whereas in patients with hypertension and thyroid disorders, the combination of liquid paraffin+MOM+sodium picosulfate was the second preference of physicians after lactulose (Figure 2). The (Table 3) displays the proportion of physicians reporting rapid relief and relief from evacuation and bloating with the use of various laxatives. Among all the laxative choices, the combination laxative containing liquid paraffin+MOM+ sodium picosulfate provided rapid relief according to 40.7% of physicians, and relief from evacuation and bloating according to 50.6% of physicians.

***Physicians' perspectives on efficacy and tolerability of the combination laxative containing liquid paraffin, MOM, and sodium picosulfate***

Liquid paraffin+MOM+sodium picosulfate was reported to be effective for overnight relief in 60%-89% of patients by 44.9% of physicians (Table 4).

Nausea/vomiting and abdominal cramps/pain were reported to be present in <1% of patients by 48.1% and 46.5% of physicians, respectively. Watery/loose stools were reported to be present in 1%-5% of patients by 43.6% of physicians.

**Table 5: Recommended dosage and safe duration of liquid paraffin + MOM + sodium picosulfate in adults with CC with comorbidities (n=243).**

| Proportion of physicians | N (%) |
|---|---|
| **Daily recommended dosage (ml)** | |
| 5 | 6 (2.5) |
| 10 | 92 (37.9) |
| 15 | 121 (49.8) |
| 20 | 10 (4.1) |
| **Safe use duration (weeks)** | |
| 1-2 | 56 (23.0) |
| 2-3 | 73 (30.0) |
| 3-4 | 68 (28.0) |
| >4 | 36 (14.8) |

Anal seepage/ incontinence was reported by 53.5% to occur in <1% of patients. Most physicians (93.0%) stated that they did not encounter any drug-drug interactions with liquid paraffin+MOM+sodium picosulfate. The most recommended daily dose for this combination according to survey physicians was 15 mL (49.8%), and the most recommended safe duration of use was 2-3 weeks (30.0%) (Table 5). In all, 14.8% of physicians recommended using it for >4 weeks. As per the survey findings, 73.7% of physicians believed that individualized dose titration is essential when prescribing liquid paraffin+MOM+sodium picosulfate to patients with CC and associated comorbid conditions. The overall efficacy, tolerability and patients' convenience and acceptability of the laxative combination containing liquid paraffin, MOM, and sodium picosulfate were rated as excellent by 62.6%, 51.4%, and 50.2%, respectively (Figure 3).

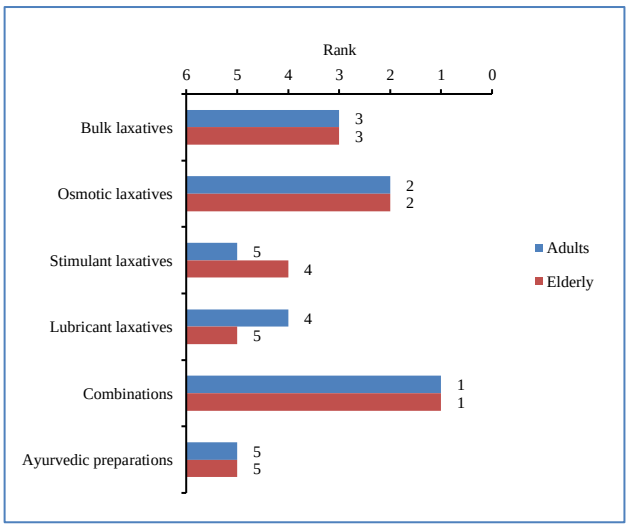


**Figure 1: Preference for types of laxatives by patient population for relief from CC (Rank in order of preference, 1=most common, 2=common, 3=average; 4=less common, 5=least common).**

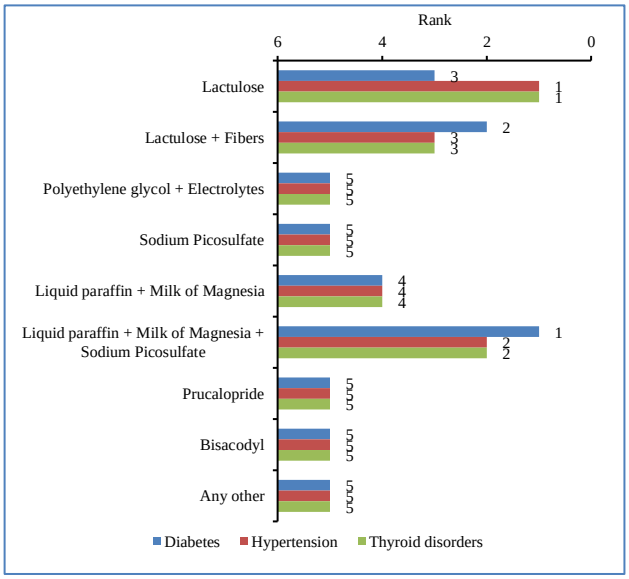


**Figure 2: Physicians' preferred laxatives for patients with diabetes, hypertension, and thyroid disorders (Rank in order of preference, 1=most common, 2=common, 3=average; 4=less common, 5=least common).**

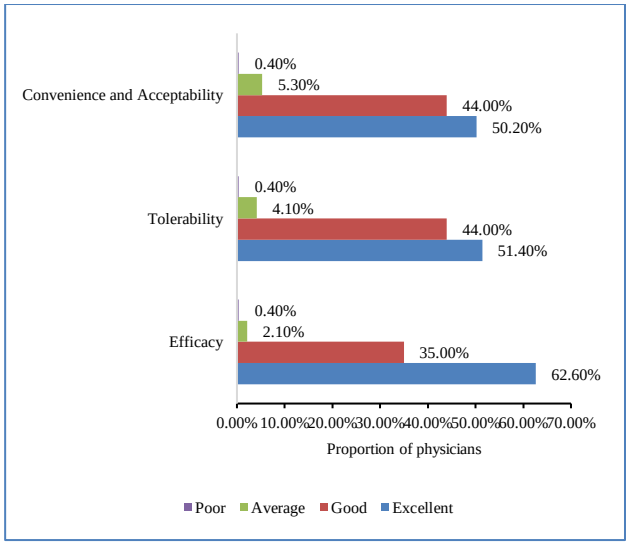


**Figure 3: Physicians' rating of laxatives containing liquid paraffin+milk of magnesia+sodium picosulfate.**

## DISCUSSION

This survey was conducted among experienced physicians managing patients with CC and comorbid conditions such as diabetes, hypertension, and thyroid disorders in India to gain a better understanding of the clinical features, diagnosis, and management of CC with a specific focus on the combination laxative containing liquid paraffin, MOM, and sodium picosulfate. The National health portal of India (NHP) reports that self-reported constipation is prevalent in 24% to 37% of the population, and CC affects 22% of adult Indians, with 13% experiencing severe constipation and 6% suffering from CC with comorbidities.[10,13] In a community-based survey conducted in India, it was reported that the prevalence of self-reported constipation within the past year was 24.8%.

However, when evaluating participants based on the Rome II criteria for constipation, the prevalence was found to be 16.8% while in a rural northern Indian community, 11.6% had CC.[14,15] Our survey results align with these statistics, with the majority of participating physicians reporting CC occurrence in 10%-39% of patients in their clinical settings.

The elderly population is at a higher risk for developing constipation.[10] In a study evaluating the constipation symptoms in 331 Indian patients seeking medical advice, it was found that 65% of patients were over 60 years of age.[16] Another study conducted in the Eastern Indian population evaluated defecation frequency and found that individuals aged >35 years had lower stool frequency, with a reduction in stool frequency starting in the mid-forties.[17] Our survey also found similar results, with a majority of the participating physicians reporting that the common age of patients with CC was >40 years of age. While the reported studies identified colonoscopy and blood tests as the primary diagnostic tools for patients with chronic constipation, our physician-based survey revealed that clinical features were the most used diagnostic tool by Indian practitioners.[18] However, the Italian association of hospital gastroenterologists (AIGO) and the Italian society of colorectal surgery (SICCR) recommend taking a comprehensive medical history as the first step toward diagnosis of CC to identify related events for designing an effective treatment plan.[19] CC is often a secondary symptom of metabolic disorders. Patients with diabetes and hypothyroidism frequently report experiencing CC as a secondary symptom.[7] The results of a research study carried out on Japanese individuals with type 2 diabetes indicated that patients who experienced constipation were notably older and had been living with diabetes for a longer period compared to those who did not experience constipation.[20] Piper et al concluded that constipation occurs more frequently in adults diagnosed with diabetes as opposed to the general population.[21] An Indian study found that diabetes was present in 13.9% of patients with CC, while hypothyroidism was present in 13.4% of CC patients.[16] A pilot study conducted in China on hospitalized elderly patients with CC, revealed reduced T4 to T3 conversion and atypical biofeedback regulation within the thyroid axis. These alterations in the production of thyroid hormones may be a contributing factor to the occurrence of CC among the elderly.[22] Another study conducted at various centers in India reported diabetes to be a commonly associated condition in 35% of patients and hypothyroidism in 12.9% of patients.[23] A significant proportion (77.78%) of Indian patients with hypothyroidism have previously reported constipation as their main complaint.[24] Constipation is also a risk factor for cardiovascular disease, and individuals with cardiovascular disease tend to experience constipation.[25] A cohort study carried out on the Danish population revealed a correlation between constipation and a heightened risk of various cardiovascular diseases, such as myocardial infarction, stroke, heart failure, and other arterial events.[26] Our survey results are corroborated by these findings, as the participating physicians reported that diabetes, hypertension, and thyroid disorders were common occurrences in their patients with CC. The results of both a SMART-2 real-world study and our survey results are consistent in that both found that the most common symptom of constipation as per the Rome IV diagnostic criteria was straining or difficulty while passing stools. In the SMART-2 study, this symptom was reported by 44.62% of participants.[23]

In a randomized controlled study, the intervention group received guidance on a constipation education program, while the control group received routine treatment. After four weeks, a statistically significant difference ($p<0.05$) was observed between the groups in terms of the quality of life of CC patients and the severity of constipation.[27] In our survey, almost all physicians were involved in providing education. In line with the recommendation for constipation management to prioritize treatment effectiveness via dietary fiber supplementation and the appropriate use of stimulant and/or osmotic laxatives, our survey also found that physicians considered efficacy as

the primary factor when selecting a laxative for patients.[28] Typically recommended agents for treating constipation comprise bulk laxatives, osmotic agents, stimulant laxatives, and lubricants.[29] Studies have shown that lactulose, an osmotic laxative, helps increase bowel movement frequency per week and may have a prebiotic effect that improves bowel function.[30] In a survey, examining pediatricians' perspectives on the management of constipation, a higher percentage of pediatricians preferred using MOM over polyethylene glycol (PEG) 3350, a potent osmotic laxative, for disimpaction (57.3% vs 43.9%) and maintenance (50.9% vs. 33.9%).[30,31] In a trial with 64 geriatric long-stay patients aged ≥65 years, magnesium hydroxide showed greater effectiveness compared with bulk laxatives. It resulted in more frequent bowel habits (13.2 vs. 10.4 per 4 weeks, $p<0.001$) and demonstrated improvement in stool consistency during the treatment course.[32]

In a randomized clinical trial for pediatric functional constipation, both PEG 3350 and liquid paraffin were found to be equally effective. Importantly, liquid paraffin demonstrated comparable efficacy to PEG 3350, an effective and safe laxative for both children and adults, in improving defecation frequency and reducing encopresis in functional constipation.[33-35] Sodium picosulfate is a well-researched stimulant laxative and was found to be highly effective and well-tolerated (5-10 mg daily, 4 weeks) for managing CC.[30,36] Stimulant laxatives work by stimulating the intestinal mucosa and nerve plexus to promote water and electrolyte secretion, leading to peristaltic contractions and faster colonic transport. Stimulant laxatives are known to be effective, and their potential side effects are well-documented. Despite this, the chronic use of stimulant laxatives does not seem to cause tolerance or rebound constipation.[37] The efficacy and tolerability of two potent stimulant laxatives, bisacodyl and sodium picosulfate, are comparable in treating CC for 4 weeks.[36] However, a UK study found that bisacodyl had a higher rate of severe adverse events (6.5%) compared to the placebo group (1.7%), whereas in a German placebo-controlled trial of sodium picosulfate, adverse events were observed with a similar frequency in both treatment groups.[38,39]

A study conducted in India using a combination laxative therapy of MOM, liquid paraffin, and sodium picosulfate showed improvements in stool frequency, consistency, and straining in constipated patients. The therapy was well tolerated and safe, with good patient adherence.[40] Our survey findings indicate that the combination laxative containing liquid paraffin, MOM, and sodium picosulfate was a preferred option for managing constipation in patients with comorbid conditions with excellent efficacy and tolerability.

### *Limitations*

This survey had several limitations. First, the survey relied solely on self-reported data from participating physicians, which may introduce recall bias and potential errors in data recording. Moreover, the survey was conducted online, which may have excluded physicians who do not have access to the Internet or who do not use it regularly. The sample size of 243 physicians may also be considered small, although it is noteworthy that this was a cross-sectional survey and not a clinical trial. Finally, the survey did not include patient-reported outcomes or clinical endpoints, such as bowel movement frequency or quality of life, which could provide a more comprehensive assessment of treatment effectiveness. Overall, these limitations suggest that further research is needed to confirm the efficacy and safety of the combination of liquid paraffin, MOM, and sodium picosulfate in the management of CC with comorbidities in India.

## CONCLUSION

In summary, CC is prevalent in India, affecting a significant proportion of the population, particularly the elderly. Patients with comorbid conditions such as diabetes, hypertension, and thyroid disorders frequently experience constipation as a secondary symptom. Clinical features of the patient are essential in diagnosing CC, and physicians prioritize treatment effectiveness when selecting laxatives for patients. In the present survey, the combination of liquid paraffin, MOM, and sodium picosulfate was reported by physicians to be effective and well-tolerated in managing CC in patients with comorbidities. Nevertheless, prospective, real-world evidence studies are warranted.

## ACKNOWLEDGEMENTS

Authors would like to thank Alpha MD for providing writing support for this manuscript.

*Funding: The survey was funded by Abbott India Ltd.*
*Conflict of interest: None declared*
*Ethical approval: Physician confidentiality and anonymity were maintained throughout the survey conduct and data analysis. As this survey did not involve any intervention to the patient, ethical approval by an Independent Ethics Review Board was not obtained*

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**Cite this article as:** Kumar R, Ramakrishnan SR, Kulkarni A. Chronic constipation with associated comorbid conditions: a physician survey on clinical perspectives on its diagnosis and management. Int J Adv Med 2023;10:695-704.