Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 27s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Incidence Of Constipation in Appendicitis Patients Who Underwent Laparoscopic / Open Appendicectomy - Retrospective Questionaire Study

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Cite this paper as: Dr. Meera Gobikha S, Dr Kishore Babu E.P, Dr Affee Asma, Dr Shyam Prashad K, (2025) Incidence Of Constipation in Appendicitis Patients Who Underwent Laparoscopic / Open Appendicectomy - Retrospective Questionaire Study, *Journal of Neonatal Surgery*, 14 (27s), 1005-1009

ABSTRACT

Background: Acute appendicitis is a common surgical emergency, often linked to luminal obstruction. Constipation, a potential contributor to such obstruction, has not been thoroughly studied as a predisposing factor.

Objective: To assess the incidence and associated factors of constipation in patients undergoing appendectomy for acute appendicitis.

Methods: This retrospective, questionnaire-based observational study was conducted at Chettinad Hospital and Research Institute. Fifty patients who underwent laparoscopic or open appendectomy were surveyed regarding bowel habits and lifestyle factors prior to symptom onset.

Results: Of the 50 patients (mean age 32 years; 66% male), 58% reported constipation before surgery. Constipation was more prevalent among females (65%) and those with comorbidities (91% vs. 44%, $p = 0.015$). Significant associations were found between constipation and unbalanced diet (75% vs. 35%, $p = 0.004$), as well as low water intake (<1.5 L/day, $p = 0.02$). Trends toward increased constipation were observed with frequent outside food consumption, poor sleep, and lack of exercise, though not statistically significant. Smoking and alcohol use showed no significant association.

Conclusion: Constipation is prevalent among appendicitis patients and is significantly associated with comorbidities, poor diet, and inadequate hydration. The high incidence of constipation in this cohort, along with its significant associations, supports the hypothesis that constipation may play a causative role in the development of acute appendicitis. By contributing to luminal obstruction through fecal stasis or fecalith formation, constipation may initiate or exacerbate the inflammatory process within the appendix. Identifying and addressing these modifiable factors may aid in risk stratification, early diagnosis, and preventive strategies in surgical populations

Keywords: *Acute appendicitis, surgery, constipation, poor diet, luminal obstruction*

1. INTRODUCTION

Acute appendicitis is one of the most common surgical emergencies, characterized by inflammation of the appendix. Despite its high prevalence, the exact aetiology of appendicitis remains multifactorial and not fully understood. Traditionally, luminal obstruction of the appendix due to lymphoid hyperplasia, fecoliths, foreign bodies has been proposed as a primary triggering

factor in the pathogenesis of appendicitis. Constipation, defined as infrequent bowel movements (fewer than three per week) which may be accompanied by difficulty in passing stool, discomfort, and a sense of incomplete evacuation may play a significant role in the development of luminal obstruction. Hard stool masses or fecaliths can obstruct the appendiceal lumen, leading to increased intraluminal pressure, bacterial overgrowth, and subsequent inflammation. While fecaliths have been identified in a subset of appendicitis cases, the broader association between constipation and the development of appendicitis has not been comprehensively investigated. In this context, constipation may act as a modifiable risk factor for appendicitis, especially in populations with dietary patterns low in fiber or with limited physical activity. This retrospective questionnaire-based study aims to assess the incidence of constipation prior to the onset of appendicitis symptoms among patients who underwent either laparoscopic or open appendectomy. By evaluating patient-reported bowel habits leading up to the acute episode, this study seeks to explore the possible correlation between constipation and the development of appendicitis

2. MATERIALS AND METHODS

This was a retrospective, questionnaire-based observational study conducted among patients who underwent surgical management for acute appendicitis at Chettinad Hospital And Research Institute in the department of General surgery between January 2025 and May 2025. Both laparoscopic and open appendectomy cases were included. Ethical approval obtained.

Inclusion Criteria: Patients diagnosed with appendicitis who underwent either laparoscopic or open appendectomy and willing to participate in the study.

Exclusion Criteria: Patients with incomplete medical records, those lost to follow-up, or those not willing to participate in the study.

Eligible patients were contacted via phone or follow up visits by the principle investigator and were asked self-designed questionnaire. The demographic section collected basic information such as name, age, gender, occupation, and body mass index (BMI). Participants were then asked if they experienced constipation and, if so, for how long. They were also queried about their bowel habits, specifically whether they often ignored the urge to defecate. Hydration practices were assessed by asking about the average daily water intake. Dietary habits were explored through questions about balanced meal consumption and frequency of eating outside food. Lifestyle aspects were covered with queries about regular physical activity and sleep patterns. Lastly, participants were asked whether they had any known health conditions, including details of current or past treatments, and about their use of substances such as tobacco and alcohol.

Data were entered and analyzed using SPSS software.

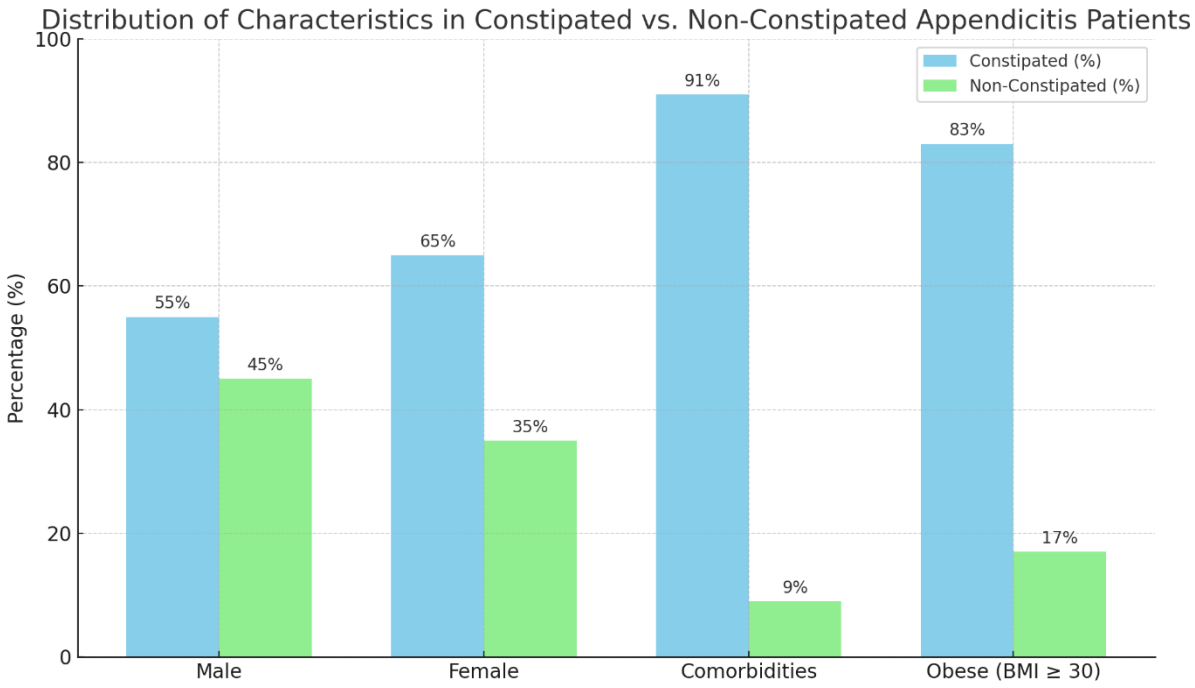
3. RESULTS

In this cohort of 50 acute appendicitis patients (mean age is 32 years, range 12–65; 66% are male), constipation prior to developing appendicitis was common. Overall, 29 of 50 patients (58%) reported constipation prior to surgery. Among constipated patients, most reported chronic symptoms (many lasting years; range 1 week to 30 years).

Constipation was slightly more prevalent in women than men (65% of females vs 55% of males).

The mean age of constipated patients was 38.0 ± 9.2 years, while non-constipated patients had a mean age of 28.1 ± 6.9 years. Though older age showed a trend toward more constipation, it was not statistically significant (t-test, $p \approx 0.18$).

Characteristic	Constipated (n = 29)	Non-Constipated (n = 21)	Total (n = 50)
Age (mean ± SD)	38.0 ± 9.2	28.1 ± 6.9	32
Male (n = 33)	18 (55%)	15 (45%)	33 (66%)
Female (n = 17)	11 (65%)	6 (35%)	17 (34%)
Comorbidities (n = 11)	10 (91%)	1 (9%)	11 (22%)



Among the 50 patients, 12 (24%) were classified as obese (BMI ≥ 30). Of these, 10 patients (83%) reported constipation prior to appendicitis. In contrast, among the 38 non-obese patients, only 19 (50%) experienced constipation. This difference was statistically significant (χ^2, p = 0.045), indicating a strong association between obesity and preoperative constipation.

Group	Constipated (n)	Total (n)	Constipation Rate (%)	p-value	Significant?
Obese (BMI ≥ 30)	10	12	83%	0.045	Yes
Non-Obese	19	38	50%		

11 patients had comorbidities such as hypertension or diabetes. Among these, 10/11 (91%) had constipation, versus 17/39 (44%) of those without comorbidities. This difference was statistically significant (χ^2, p = 0.015).This suggests underlying health conditions may increase risk of preoperative constipation.

26 patients (52%) reported eating a balanced diet. Among them**, 9/26 (35%)** had constipation. In contrast, **18/24 (75%)** of those without a balanced diet had constipation. This difference was **statistically significant** (χ^2, **p = 0.004).**

Among the 50 patients, **60% (30 patients)** reported a daily water intake below the recommended levels (<1.5 litres/day).Patients with reduced water intake were found to have a higher risk of developing appendicitis compared to those with adequate water consumption . (p = 0.02).

Only 7 patients (14%) reported regular exercise. Constipation was found in 5/7 (71%) of exercisers and 22/43 (51%) of non-exercisers (p ≈ 0.29), not statistically significant.

23/50 (46%) reported a regular sleep schedule. Constipation rates were 15/23 (65%) in those with regular sleep versus 12/27 (44%) without it. Though the trend was suggestive, it did not reach statistical significance (p ≈ 0.10).30 patients consumed outside food at least weekly.

Constipation was present in 20/30 (67%) of frequent outside eaters versus 7/20 (35%) of those eating out less frequently. This trend approached significance (p ≈ 0.08), indicating a potential role for processed food intake.

Factor	Group	Constipated (n)	Total (n)	Constipation Rate (%)	p-value	Significant?
Diet	Balanced	9	26	35%	**0.004**	Yes
	Unbalanced	18	24	75%		
Water Intake	< 1.5 L/day	20	30	60%	0.02	Yes
Exercise	Regular (n = 7)	5	7	71%	0.29	No
	Sedentary (n = 43)	22	43	51%		
Sleep Schedule	Regular	15	23	65%	0.10	No
	Irregular	12	27	44%		
Outside Food Intake	≥1×/week	20	30	67%	0.08	No
	<1×/week	7	20	35%		

10patients (20%) were smokers, and 7 (14%) consumed alcohol. Constipation was observed in 4/10 (40%) of smokers vs 23/40 (58%) of non-smokers and 4/7 (57%) of drinkers vs 23/43 (53%) of non-drinkers .Neither smoking nor alcohol showed significant association with constipation (p > 0.3).

Substance Use	Group	Constipated (n)	Total (n)	Constipation Rate (%)	p-value	Significant?
Smoking	Smoker	4	10	40%	>0.3	No
	Non-smoker	25	40	63%		
Alcohol Use	Drinker	4	7	57%	>0.3	No
	Non-drinker	25	43	58%		

4. DISCUSSION

This study highlights a high prevalence of preoperative constipation among patients with acute appendicitis, with 58% of the 50-patient cohort reporting constipation prior to surgery. Several clinical and lifestyle factors were examined for associations with constipation, and our analysis revealed **statistically significant relationships** with **comorbidities, diet quality, and daily water intake. Obesity was also found to be significantly associated with preoperative constipation.** In our study, 83% of obese patients reported constipation, compared to 50% among non-obese individuals. This relationship may be explained by obesity-related reductions in colonic motility and increased prevalence of sedentary behaviours, which contribute to fecal stasis . Importantly, since obesity itself is a modifiable risk factor, this reinforces the need for integrated lifestyle and nutritional counselling in populations vulnerable to appendicitis .Constipation was significantly more common among patients with underlying comorbidities such as hypertension and diabetes. Of the 11 patients with comorbidities, 91% were constipated, compared to only 44% among those without comorbidities (p = 0.015). This finding suggests a possible physiological link between systemic health conditions and impaired gastrointestinal motility. Comorbidities such as diabetes may affect autonomic function and colonic transit, contributing to chronic constipation. These results are consistent with prior literature indicating that metabolic disorders are associated with altered bowel habits and delayed colonic transit. Dietary habits emerged as a key modifiable factor. Patients reporting a balanced diet had significantly lower rates of constipation (35%) compared to those with unbalanced diets (75%, p = 0.004). A fiber rich diet, commonly associated with

balanced nutritional intake, likely promotes better stool consistency and frequency. These findings align with previous epidemiological studies where low fiber intake was strongly linked to functional constipation. This result reinforces the importance of dietary assessment and intervention in gastrointestinal health, particularly among at-risk surgical populations. A striking and highly significant relationship was observed between water intake and constipation. Constipation was present in 60% of patients consuming < 1.5 litres of water daily($p < 0.02$). The statistical strength of this relationship suggests hydration remains a critical factor .While regular exercise and sleep patterns were not significantly associated with constipation in this study, trends toward reduced constipation with physical activity and structured sleep were observed. These findings echo broader literature suggesting that sedentarism and sleep disturbances may contribute to dysregulation of gut motility, but our sample size may have limited power to detect small-to-moderate effects. Similarly, higher constipation rates were observed in patients consuming outside food more frequently, approaching statistical significance ($p \approx 0.08$), indicating a potential role of processed or low-fiber meals in constipation risk. Neither smoking nor alcohol consumption was significantly associated with constipation in our study. Although some studies have proposed a link between tobacco use and bowel function, our findings suggest no clear relationship in this surgical cohort. Alcohol's effects on motility are also complex and dose-dependent, which may have masked any associations given the low prevalence of alcohol use in this population. These findings underscore the importance of **screening for constipation and modifiable lifestyle factors** in patients presenting with appendicitis. Preoperative constipation may contribute to diagnostic delay, atypical symptoms, or complicated postoperative recovery. Recognizing patients at higher risk—particularly those with comorbidities or suboptimal diets—may allow for earlier intervention or education on bowel health. Furthermore, this study suggests that lifestyle counselling should be an integral component of surgical and pre-surgical care, especially in young adults prone to dietary imbalances and poor hydration. This study is limited by its modest sample size and cross-sectional design, which prevents causal inferences. Patient-reported measures (e.g., diet quality, water intake) may be subject to recall or reporting bias. Additionally, the observed association between higher water intake and constipation likely reflects reverse causality, emphasizing the need for prospective studies to validate these findings. Preoperative constipation is prevalent in patients with acute appendicitis and is significantly associated with comorbidities, poor diet, and reported high water intake (possibly in response to existing constipation). These insights may improve perioperative risk stratification and highlight the need for broader nutritional and lifestyle assessment in emergency surgical settings. Future prospective, multicentre studies are warranted to better understand the temporal and mechanistic links between these factors.

5. CONCLUSION

This study reveals a high prevalence of preoperative constipation among patients with acute appendicitis, suggesting a potential link between bowel habits and the pathogenesis of appendicitis. Statistically significant associations were identified between constipation and key modifiable lifestyle factors, including poor dietary habits, inadequate water intake, and the presence of comorbid conditions. Obesity was also significantly associated with constipation, highlighting another modifiable risk factor that may contribute to the development of appendicitis. Integrating weight management strategies alongside bowel health interventions could improve surgical outcomes and potentially reduce the incidence of appendicitis linked to constipation.These findings underscore the importance of assessing gastrointestinal health and lifestyle behaviours in patients at risk for appendicitis.

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