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Report

Survey of Drug Treatment for Constipation in Patients Undergoing Hemodialysis

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Patients undergoing hemodialysis are prone to gastrointestinal complications such as constipation, indigestion, abdominal pain, and reflux, with constipation being a particular problem. Various reasons, including fluid intake and dietary restrictions, decreased bowel motility due to changes in body water content, decreased physical activity during dialysis, and the use of serum potassium suppressants and phosphorus-adsorbing drugs, can explain this. However, there are no guidelines for treating constipation in patients undergoing hemodialysis, and physicians still use their own judgment when selecting medications. In this study, we investigated the use of laxatives in patients undergoing hemodialysis and evaluated their safety. The results showed that 40.0% of the patients regularly used laxatives. The laxative Macrogol (Movicol®) accounted for more than 80% of the patients. No changes in body weight or serum potassium levels were observed after 3 months of Movicol® initiation, suggesting that the drug is safe for patients undergoing hemodialysis.

Key words hemodialysis, constipation, macrogol

INTRODUCTION

Owing to an increase in underlying diseases such as diabetes mellitus, the number of patients undergoing hemodialysis in Japan was estimated to be approximately 350,000 in December 2023. Patients are prone to gastrointestinal complications such as constipation, indigestion, abdominal pain, and reflux, with constipation being a particular problem.^{1,2)} Various factors, including fluid intake, dietary restrictions, decreased bowel motility due to changes in body water content, decreased exercise during hemodialysis, and the use of serum potassium suppressants and phosphorus adsorbents, may explain this.

The World Gastroenterological Association and American Gastroenterological Association have proposed guidelines for the medical management of constipation.^{3,4)} The first recommendation is that lifestyle modifications (e.g., fluid intake, exercise, and fiber supplementation) are important in treating chronic constipation. The next step is to add osmotic laxatives (e.g., polyethylene glycol (PEG), lactulose, and magnesium). Magnesium oxide preparations, which are laxatives with low drug costs and are not habit-forming due to long-term administration, are widely used for the treatment of constipation in Japan.⁵⁾ However, the package inserts of magnesium oxide preparations warn against hypermagnesemia in patients with impaired magnesium excretion, such as those with impaired renal function. Hypermagnesemia can lead to the development

of gastrointestinal symptoms such as anorexia, nausea, vomiting, and arrhythmia, and in severe cases, can cause death.

Many patients undergoing hemodialysis with severe constipation have difficulty improving their lifestyle, such as fluid and fiber intake, due to the risk of excessive fluid accumulation and hyperkalemia. Owing to the wide variety of medications used, they require medication for constipation owing to the wide variety of medications used. However, there are no guidelines for treating constipation in patients undergoing hemodialysis, and physicians still use their own judgment when selecting medications.

In this study, we investigated laxatives used by patients undergoing hemodialysis and evaluated their safety.

METHODS

This retrospective investigation included patients undergoing hemodialysis at Ina Hospital (Ina-machi, Saitama Prefecture) between June 1, 2024, and September 30, 2024. The sex, age, whether or not they were taking laxatives, and the type of laxatives were investigated retrospectively. Changes in body weight (kg) and serum potassium levels (mEq/L) at the beginning and 3 months after the start of Macrogol (Movicol®) were also investigated. This study was approved by the Institutional Hospital Ethics Committee (Approval No. 148).

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RESULTS

This study included 100 patients (70 males and 30 females) with a mean age of 69.4 years. Of the 100 patients, 40 used laxatives regularly. The laxatives used and the number of patients are listed in Table 1. In total, 33 of the 40 patients (82.5%) were taking Macrogol (Movicol®), and the mean age was 73.8 years. Patients prescribed macrogol received either 6.9 g/day (n=11) or 13.7 g/day (n=22), all administered once daily dissolved in water. Table 2 shows the changes in body weight and serum potassium levels of the patients using Movicol®. Body weight and serum potassium levels were similar 3 months of initiation with no change from the time of initiation.

DISCUSSION

This study was conducted at Ina Hospital, a single hemodialysis center in Japan. Macrogol (Movicol®) was the most commonly used medication for treating constipation in patients undergoing hemodialysis (over 80%). Magnesium oxide, which is considered problematic in patients with impaired renal function, was not used. The high proportion of macrogol use may reflect a preference for non-magnesium-based agents in hemodialysis patients, who are at greater risk of hypermagnesemia.⁶⁾ Additionally, its low systemic absorption and favorable safety profile make macrogol a suitable first-line treatment for constipation in this setting. On the other hand, Movicol® is dissolved in water and contains sodium chloride, sodium bicarbonate, and potassium chloride, which are present in trace amounts but require caution in hemodialysis patients, there are safety concerns regarding water content and electrolyte balance. Given these concerns, body weight and serum potassium were selected in this study as primary safety indicators. However, no changes in body weight or serum potassium levels were observed 3 months after starting Movicol®, suggesting that the drug can be safely used in patients undergoing hemodialysis. In addition, since Movicol® is indicated for pediatric use and the mean age of the patients in this study was 73.8 years, it was inferred that the drug can be used in patients of a wide range of ages. Furthermore, the 3-month observation period was considered appropriate from a clinical standpoint, as it aligns with the standard evaluation periods used in previous studies on macrogol treatment.^{7,8)}

Compared to linaclotide and elobixibat, which may pose issues such as diarrhea or high cost, macrogol is cost-effective and easy to administer. Although linaclotide is effective

for functional constipation, its role in hemodialysis patients remains less studied.⁹⁾ In our study, its use was limited to only five patients, suggesting cautious application in this population.

Patients on hemodialysis are often required to restrict potassium and fluid intake due to renal impairment. Potassium restriction leads to a reduced intake of fruits and vegetables, which leads to inadequate fiber intake. Fluid restriction may also lead to a reduction in the water content of stool, which is likely to contribute to constipation. Constipation in hemodialysis patients can significantly impair quality of life (QOL), contributing to reduced appetite, discomfort, and poor adherence to nutritional therapy.¹⁰⁾ By alleviating these symptoms, macrogol may indirectly support improved QOL and treatment outcomes. Recent population aging has also contributed to inactivity and prolonged bed rest, which can lead to gastrointestinal tract dysfunction and reduced peristalsis. In addition, patients undergoing hemodialysis take a wide variety of medications. Despite the high prevalence of chronic constipation in patients undergoing hemodialysis, few clinical reports have been published.

This study has several limitations. First, it was conducted at a single institution with a relatively small sample size. Second, the study period was limited to three months, which may not reflect long-term safety, and additional indices such as blood pressure or other electrolytes were not evaluated. Third, individual differences in drug adherence or usage details were not controlled. These factors should be addressed in future studies.

This study provides a valuable foundation for the treatment of constipation in patients undergoing hemodialysis and highlights the need for further clinical validation in broader patient populations.

Conflict of interest The authors declare no conflict of interest.

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Table 1. Types of Laxatives Used and Number of Patients Undergoing Hemodialysis Using Them

Name of laxative	Number of patients (%)
Macrogol 4000 (Movicol®)	33(82.5%)
Linaclotide (Linzess®)	5(12.5%)
Elobixibat (Goofice®)	1(2.5%)
Sodium picosulfate (Laxoberon®)	1(2.5%)

Table 2. Changes in Body Weight and Serum Potassium Levels in patients Using Macrogol Formulations

	Beginning	One month after the start	Three months after the start
Body weight (kg)	56.2	56.7	56.4
Serum potassium levels (mEq/L)	4.8	4.8	4.8