



CHAPTER V

DISCUSSION CONCLUSION AND RECOMMENDATION

Discussion

Constipation is a common pediatric problem in childhood. Most cases are associated by painful defecation classified as functional constipation. Although constipation is quite common, there were very few studies comparing different laxatives in children (13-17). Age groups of study patients, inclusion criteria, and outcome assessment of these studies were different. Four randomized controlled trials by Gremse et al , Voskuil et al , Dupont et al, Attar,et al (14-16, 26) were conducted to compare 2 laxatives, PEG vs lactulose. They found that patients in the PEG groups had more stool frequency after treatment than patients in the lactulose groups. Two studies, 1 case control study and another 1 randomized controlled trial by Loening-Baucke et al, compared PEG vs MOM in treatment of childhood constipation (13,17). These studies were performed in children aged more than 4 years. The results did not demonstrate superior effectiveness of PEG compared with MOM. However, high dropout rate in the latter study (17).

This randomized controlled study is the first study in which all eligible patients were enrolled using clearly defined new Rome III criteria for infants and children aged 1-4 years with functional constipation (6). This is to the best of our knowledge also the first study performed to compare 2 laxatives, PEG and MOM, in this young age group. Moreover, the primary outcome of this study was the proportion of patients who exhibited improvement after 4 weeks of treatment, not only the increase in stool frequency as in some former studies. To our knowledge, the increase in stool frequency alone is not representative of improvement without considering the stool consistency and child's symptoms such as pain or other difficulty on defecation. Therefore, the Bristol stool form scale (35) for evaluation of stool consistency was used in this study. Moreover, specifically designed parental record forms, which parents used to record the

daily details of their child's bowel movement and symptoms during the intervention period, provided on valid and reliable method of assessing the outcomes of this study. It was not possible to perform a blinded study because these 2 medications were administered to children in different ways

The aim of this trial is to assess the difference in effectiveness between the 2 laxatives, PEG and MOM, for the treatment of functional constipation in infants and young children. We evaluated the short term outcomes at 4 weeks in term of improvement, stool frequency, adverse effects and the compliance rate. All baseline characteristics were balance. Age, body weight, sex, duration of constipation before treatment, family history of constipation and previous laxative treatment were not significantly different. Moreover, the amount of dietary fiber intake was also analyzed using the dietary records of every patient. We found that our study patients in both group had low dietary fiber intake per day and this was not significantly different between groups. We considered this as it might be a potential confounder that affected the outcome of treatment if there was an imbalance between groups.

Our findings demonstrated more improvement in the PEG, compared to the MOM group at 4 weeks. (improvement rate 91% vs 65%, $p = 0.003$). The effect size as the difference in proportion of patients with improvement between 2 groups after 4 weeks of treatment, was 26 % (95% CI 9.8, 43%). The calculated number needed to treat was 4. It means that, 4 patients treated with PEG are required to achieve one more case of improvement. Similar effects was still preserved when performed a sensitivity analysis as the intention to treat principle. Those who were lost to follow up at the end of the study were included, assuming that this individuals did not improve after treatment. The patients in the PEG group still had more improvement than the patients in the MOM group (improvement rate 89% vs 60%, $p=0.001$).

The difference in the effectiveness of treatment between 2 medications could also be observed at 2 weeks follow up visit in our study. We found that patients in the PEG group had more improvement than the MOM group at this time ($p=0.045$). The treatment response was earlier than expected. It may be due to the younger age group.

of our study patients when compared with former studies (13,17). Older patients have a longer duration of constipation and more stasis in the colon and will have more difficulty with treatment.

Similar to previous studies (13-17), this study shows that PEG and MOM were not associated with any serious adverse effects. Although some adverse events, such as abdominal pain/ discomfort and bloating/ flatulence, were often observed by parents of children in both treatment groups, all the symptoms were mild and transient, and there were no complaints from the parents. Diarrhea occurred more frequently in MOM treatment group than the PEG group, but the symptoms resolved after reducing the dosage.

Compliance with taking PEG was superior (89%), compared with MOM-treated patient (72%). This finding was similar to the study by Loening-Baucke et al (17), but with lesser difference. The advantage of PEG 4000 is that it has a good taste, orange-grapefruit flavored, and can be mixed in fruit juice. MOM does not have good palatability and its taste is difficult to hide even when it is mixed with foods. However, the compliance of patients is important in successful treatment of constipation, especially long term treatment.

Conclusion

Our study showed that PEG had more effectiveness, and had better patient compliance than MOM for the management of functional constipation in infants and children aged 1-4 years.

Expected Benefit and Application

It provides more information for pediatricians and general practitioners about a new laxative (PEG 4000 without electrolytes) and the common used one (MOM). From this study, PEG was more effective, and more patient compliant than MOM. Therefore, pediatricians and general practitioners will have a new choice of medication for

treatment of functional constipation in infant and children. Furthermore, when the functional constipation was managed early, especially since the young age group period, with more effective medication, the patients will be resolved early, not further develop chronic constipated symptoms in the older childhood or adulthood period which are more difficult, more complex to manage and more complications.

Recommendation

Further study should be conducted to evaluate long term outcome as the recovery of functional constipation , performed in different age groups of the patients and also the cost-effectiveness analysis of these 2 laxatives.