Trans-Upper GI Endoscope PEG Infusion for Bowel Preparation prior to Colonoscopy: A Comparative Study of Isotonic versus Hypertonic PEG

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Background
The use of polyethylene glycol (PEG) in large volumes is required for bowel preparation prior to colonoscopy and is therefore associated with considerable gastrointestinal (GI) distress. Therefore, we proposed a PEG infusion method using an isotonic PEG (Nifiloc) at DDW 2013.

Objective
1) To evaluate the comparative effectiveness of the infusion method using isotonic PEG (Nifiloc) versus hypertonic PEG (Moviprep®)
2) To improve GI distress in patients undergoing bowel preparation for colonoscopy.

Patients and Methods
After completion of routine upper and lower GI endoscopic procedures, bowel cleansing with PEG infusion into the duodenal second portion and the gastric corpus was attempted in this study as a modality for bowel cleansing prior to colonoscopy to alleviate GI distress. Of the 152 patients given Nifiloc between June 2013 and March 2014, and of the 261 patients given Moviprep between June 2013 and October 2014 at TF Clinic, the study included, as successful cases for analysis, 147 patients given Nifiloc (96.7%) and 250 patients given Moviprep (96.9%) in whom PEG 0.8L or greater was infused using the GI endoscope. Each group was evaluated for efficacy of bowel cleansing with the GI infusion as assessed by endoscopy and patient satisfaction to evaluate the usefulness of the modality. To reduce the abdominal fullness during endoscopic examinations including PEG infusion, we used CO2, instead of room air, for endoscopic insufflation. PEG infusion via the GI endoscope was performed manually by using 50 mL syringes for Nifiloc or by using a trans-endo-scope water conveyance system for Moviprep (Water Please, Forto Groov Medical Co., Japan), with the infusion time set at 5 minutes in either case.

Bowel Preparation with PEG Infusion in Patients Undergoing Both Upper and Lower GI Endoscopic Procedures in One Day

PEG Infusion Using a Trans Endoscope Water Conveyance System
- Start an upper GI endoscopic procedure
- Infuse proper dose of PEG slowly into the duodenum first and then proper dose of PEG into the stomach
- Give 2 “dipper” hydrophilic colon 50 mg tablets, 30 minutes after the upper GI endoscopic procedure
- 3 hours after PEG infusion, start a lower GI endoscopic procedure (colonoscopy)

PEG Infusion Using a GI Endoscope
- Infusion proper dose of PEG slowly into the duodenum first and then proper dose of PEG into the stomach
- Give 2 “dipper” hydrophilic colon 50 mg tablets, 30 minutes after the upper GI endoscopic procedure
- 3 hours after PEG infusion, start a lower GI endoscopic procedure (colonoscopy)

Results
Greater bowel cleansing as well as higher patient satisfaction was achieved with Moviprep at a lower dose within a shorter time than with Nifiloc (Table). Reasons for discontinued due to PEG infusion less than 0.8 L included gastric reflux in 4 patients given Nifiloc and vomiting in 1 patient given Nifiloc, versus gastric reflux in 5 patients, some throat, vomiting, abdominal fullness, in 1 patient each given Moviprep. No associated complication, such as aspiration pneumonia, was seen with either PEG.

Summary of Results Described in Table
Compared to Nifiloc, Moviprep offers:
- Superior bowel cleansing at a lower dose
- GI endoscopic procedures in a shorter time
- Greater patient satisfaction

Analysis of Patients Completing PEG infusion > 0.8 L (Successful Cases)

<table>
<thead>
<tr>
<th></th>
<th>Nifiloc (PEG 0.8L)</th>
<th>Moviprep (PEG 0.8L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Infusion Volume</td>
<td>0.91 L (0.78 - 1.05)</td>
<td>0.90 L (0.78 - 1.05)</td>
</tr>
<tr>
<td>Viscosity/Weight</td>
<td>1.16 mg/mL (1.14 - 1.18)</td>
<td>0.96 mg/mL (1.14 - 1.18)</td>
</tr>
<tr>
<td>Viscosity/Volume</td>
<td>4.89 (1.16 - 1.43)</td>
<td>3.87 (1.16 - 1.43)</td>
</tr>
<tr>
<td>Mean Infusion Duration</td>
<td>32.7 minutes (40 - 270)</td>
<td>112.5 minutes (40 - 270)</td>
</tr>
<tr>
<td>Hematoцит</td>
<td>93.9% (342/410)</td>
<td>93.8% (325/325)</td>
</tr>
<tr>
<td>Mean Sedimentation Time</td>
<td>1.0 min (2-6)</td>
<td>1.0 min (2-6)</td>
</tr>
<tr>
<td>Mean Viscosity</td>
<td>87.2% (128)</td>
<td>93.7% (128)</td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td>&quot;excellent&quot;</td>
<td>68.6% (128)</td>
</tr>
</tbody>
</table>

Conclusions
Trans-Upper GI endoscope PEG infusion is a useful method for bowel preparation prior to colonoscopy as not calling for large amounts of PEG. Hypertonic PEG offers superior bowel cleansing than isotonic PEG and is therefore thought to be suitable for use in the proposed PEG infusion method.

There are no potential conflicts of interests related to this presentation.
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Higher patient satisfaction was achieved due to PEG infusion less than 0.8 L in 5 patients, sore throat, vomiting in 1 patient, pneumonia, was seen with either PEG.

Table 1: Descriptions of the infused method

1) To improve GI function during bowel preparation for colonoscopy
2) Infusing with a PEG solution

Infusion Method

PEG Infusion

Dosage

Recommended dosage: 500 mL

Duration

Infused within a shorter time than with Nifed or vomiting in patients given Nifed, vomiting in 1 patient, pneumonia, was seen with either PEG.
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Many thanks,

Thierry Ponchon

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A Comparative Study of Isotonic versus Hypertonic PEG
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Background
The use of polyethylene glycol (PEG) in large volumes is required for bowel
cleansing during upper endoscopy. It is therefore associated with high
volumes of fluid intake during procedures. Therefore, we proposed a PEG infusion
of 0.8 L per patient at DDW 2013.

Objective
To evaluate the effectiveness of the infusion on bowel cleansing and
symptoms in patients undergoing bowel preparation.

Patients and Methods
In a randomized placebo-controlled trial, patients undergoing
bowel preparation were assigned to receive a PEG infusion of 0.8 L or a
placebo at DDW 2013.

Results Described in Table

<table>
<thead>
<tr>
<th>Patients Completing PEG Infusion &gt; 0.8 L (Success)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean cleansing time (range)</td>
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<tr>
<td>Mean cleansing time (range)</td>
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<tr>
<td>Patient satisfaction</td>
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<td>Patient satisfaction</td>
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<td>Patient satisfaction</td>
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<tr>
<td>Mean infusion volume</td>
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<td>Mean infusion volume</td>
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<tr>
<td>Mean infusion volume</td>
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<tr>
<td>PEG volume associated with</td>
</tr>
<tr>
<td>&quot;Excellent&quot;</td>
</tr>
<tr>
<td>&quot;Moderate&quot;</td>
</tr>
<tr>
<td>&quot;Bad&quot;</td>
</tr>
</tbody>
</table>

Moviprep
PEG volume
PEG offers superior bowel cleaning

Moviprep (PEG-ELS+Asu)**

100% (283/283)

100% (251/251)

100% (215/215)

100% (142/142)

100% (11/11)

100% (32/32)

100% (12/12)

100% (6/6)

100% (3/3)

100% (2/2)

100% (1/1)

100% (1/1)

100% (1/1)

100% (1/1)

100% (1/1)

100% (1/1)

100% (1/1)