Colonoscopy Preparation

Daniel Sussman, MD
19 February 2010
SGNA Course
Objectives

- Importance of preparation
- Types of preps
- Comparative evidence behind prep choice
  - Efficacy
  - Tolerability
  - Safety profiles
Importance

• Poor quality prep
  – Missed diagnoses (neoplasms)
  – Increase cost of repeat procedure

• Inadequate in 25% patients, largely due to poor patient compliance
Ideal Prep

• Perfect colon cleansing
• Well tolerated
• Safely administered
Purgative Formulations

• Hyperosmotic
  – Sodium phosphate
  – Magnesium citrate
  – Draw fluid into bowel lumen/small volumes

• Osmotic balance in dilute electrolyte soln
  – Poly-ethylene glycol-electrolyte lavage systems (PEG-ELS)
    • Ingestion of large volumes of non-absorbable fluid
Adjunct Medications

• Simethicone
  – Improved visibility due to decreased bubble effect noted in 5 out of 6 studies

• Metoclopramide, cisapride, senna
  – Do not add benefit
Sodium Phosphate Regimens

• Fleet Phospho-soda
  – 90 mL of solution (60g) divided in two 45 mL doses

• Visicol tablets
  – 40 tablets (60g)
  – MCC free

• OsmoPrep tablets
  – 32 tablets (48g)
PEG-ELS

• 4 liter systems
  – GoLYTLEY (contains NaSulfate – salty taste)
  – Colyte
  – NuLYTELY (sulfate free)
  – TriLyte (sulfate free)

• Reduced-volume (2 liters)
  – HalfLytely and bisacodyl tablets
  – MoviPrep (with ascorbic acid)
Comparison

• PEG 4L vs NaPhosphate 90mL
• Blinded endoscopists rated bowel preps
  – Excellent
  – Good
  – Fair
  – Poor
• Efficacy (score of excellent or good)
  – PEG 33% vs NaPhos 80% (p < 0.001)
• Tolerability (ease of finishing prep)
  – PEG 31% vs NaPhos 85% (p < 0.001)
Meta-Analysis

• 16 clinical trials
• Adequate bowel prep (good or excellent)
  – More likely with NaPhos ($p = 0.0004$)
• NaPhos more likely to complete prep than PEG (94 vs 71%, respectively)
• Majority of PEG was 4L
PEG and NaSulfate

• Salty taste
• Sulfate free preferred 3:1
• Similar efficacies of free vs containing (78 vs 72%, respectively)
• Flavored formulations available
  – Preferred by 75% patients
PEG Volume

• 2L vs 4L
• Efficacy
  – PEG 2L + bisacodyl (87%) vs PEG 4L (92%)
• 2L with reduction in overall discomfort ($p \leq 0.01$)
• Newer regimen with ascorbic acid does not require bisacodyl
  – Comparable efficacy (90 vs 95%)
  – Less nausea (14 vs 23%), abdominal pain (3 vs 8%)
  – Better acceptability and completion rate ($p=0.035$)
NaPhos Advances

• Methylcellulose (MCC)
  – Excipient in older generations
  – Reportedly hinders visualization
• MCC-free formulation
  – Comparable efficacy and better tolerability than MCC-containing
  – Better cleansing and tolerability than PEG 2L + bis
    • 90 vs 82%, respectively (p=0.04)
  – Fewer adverse events
    • 66 vs 82%, respectively (p=0.0003)
    • Abdominal distension, abdominal pain, vomiting
  – Easy to take
    • 77 vs 42%, respectively (p<0.0001)
Magnesium Citrate

• Saline laxatives containing NaPicosulfate and MgCitrate used primarily in UK
  – Equivocal differ efficacy compared to NaPhos

• Adding MgCitrate to PEG 2L improves prep quality and patient satisfaction compared with PEG 4L
  – May use to decrease volume used by patients
Safety

• NaPhos
  – Fluid and electrolyte shifts
    • No use in renal, CHF, cirrhotic patients

• PEG-ELS
  – Ileus, gastric retention, perforation, obstruction, severe colitis?

• Magnesium
  – Renally excreted
  – No use in renal patients, abdominal hemorrhage or obstruction
  – Fatal hypermagnesemia with ARF
  – Hyponatremia with seizures
Importance of Hydration

• Comparable weight loss occurs with PEG and osmotic agents – concern in both
• Orthostatic hypotension more common with PEG 4L than NaPhos with bisacodyl (25 vs 12%, resp; p=0.05)
• Baseline health status important
  – Inpatients (IBD, GI bleed, diarrhea) more likely than outpts to have postural hypotension (30 vs 7%, p < 0.05)
  – Outpts should drink liberal fluids on day prior
  – Inpts should receive IV replacement
More on Hydration

• Carbohydrate-electrolyte rehydration solutions may improve orthostasis over clears
  – NaPhos prep
  – 43 vs 65% developed orthostasis (p=0.005)
  – Weight loss 15% greater in clears group

• Small volume hyper-osmotic agents associated with transient electrolyte derangements
  – Usually resolve within 24 hrs
  – Hyperphosphatemia, hyponatremia
Hyperphosphatemia

• Most common electrolyte disturbance
  – 43% with NaPhos; 10% with PEG

• Risks with:
  – Renal impairment
    • Especially in elderly
  – Bowel obstruction
  – Medications
    • ACE-inhib, ARB, diuretics
Hyponatremia

• Vomiting, diarrhea, renal disease, inappropriate ADH secretion
• Mostly a concern for osmotic agents
• Fatalities have occurred with PEG agents in patients with chronic renal disease taking diuretics
Acute Phosphate Nephropathy

• aka nephrocalcinosis
• Calcium phosphate deposition in kidneys
• Associate with decreased intravascular volume and hyperphosphatemia
• Retrospective chart review
  – 21 pts with biopsy confirmation
  – Risk factors according to FDA warning
    • Hypertension
    • Medications (ACE-I, ARB, diuretics, NSAIDs)
    • Elderly
    • Inadequately hydrated
Post-colonoscopy Renal Insufficiency

• Incidence estimated < 1/1000
• Acute kidney injury (25% or 0.5 mg/dL increase in creatinine) in 6 months post-colon
  – 141/2237 outpts (6%)
  – Risks: female gender, CHF, diuretics, ACE-I or ARB
• 3 retrospective studies found rates of developing renal insufficiency similar regardless of prep type (NaPhos vs PEG)
PEG-ELS Dosing

- Standard is 8oz every 10 minutes until rectal output is clear or entire prep is ingested
- No solid food within 2 hours of prep
- Halflytely – up to 4 tabs bisacodyl within 6 hours of prep
- Moviprep allows normal breakfast and lunch?
  - 1L over one hour followed by 160z clears
  - Repeated either 1.5 hrs later or next morning
Split Dosing PEG

- American Society of Anesthesia guidelines recommend that clear liquids can be safely ingested up to 2 hours prior to anesthesia.
- PEG administration within 5 hours of procedure improves bowel prep compared to 19 hours before ($p < 0.0001$).
NaPhos Dosing

• Solution
  – 2 x 45 mL doses taken 10-12 hours apart
  – Each dose diluted in 8oz clears and followed by 16oz clears

• Tablets
  – Evening prior, 20 tablets (4 tabs Q15min, each with 8 ounces clears)
  – 3-5 hours prior, 20 tabs (Visicol) or 12 tabs (Osmoprep)
  – Less hyperphosphatemia with Osmoprep
Recommendations

- NaPhos and newer generation PEG-ELS are efficacious and better tolerated than traditional
- NaPhos more effective and better tolerated than PEG-ELS
- Patient evaluation is critical in preventing complications
- Risks exist with both PEG-ELS and NaPhos
- Hydration should be emphasized
- Patients should contact GI office if fluid intake impaired or if vomiting
- If risk for electrolyte disturbance identified, baseline and post-treatment monitoring per product labeling
References

