

A Retrospective Study on Use of Neostigmine for Management of Non Mechanical Bowel Obstruction

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ABSTRACT

INTRODUCTION: In this study we study the role of neostigmine in nonmechanical bowel obstruction either it may be due to post operative ileus or may be due to some severe illness like pancreatitis and liver abscess. In post operative ileus normal bowel function can be affected by three main mechanism: neurogenic, inflammatory mediators and gastrointestinal hormones. In GI system parasympathetic system increase gut motility while sympathetic system inhibit gut motility. After major surgeries sympathetic nervous system tends to be more active than parasympathetic one which causes ileus.

METHOD: All patients receive 2.5 mg of neostigmine IV (diluted in 10 ml normal saline) over a period of five minutes. All patients were monitored by electrocardiography; atropine and glycopyrolate was kept ready on bedside and 1.0 mg was given intravenously in case of symptomatic bradycardia.

RESULTS: In our study we retrospectively analyzed 45 patients. Out of which 28 were male and 17 patients were female. Male to female ratio was 1.65:1. The patient ranged from 18 years to 70 years. 27 patients showed improvement in clinical symptoms (passed flatus and faeces) after 3 to 5 minutes, 12 patients showed improvement in 5 to 10 minutes and 4 patients showed improvement in more than 10 minutes. 2 patients were not improved till one hour after injecting neostigmine. Symptomatic bradycardia was seen in 3 (~7%) patient. In two patient pulse rate was decreased upto 36. Abdominal pain was the most common side effect noticed in 23 (~51%) of patients, excessive salivation (~30%) and vomiting (~20%) were second and third most common side effect respectively.

CONCLUSION: On the basis of our findings we can suggest that it is feasible to use neostigmine in non mechanical bowel obstruction.

Keywords: Nonmechanical Bowel Obstruction, Neostigmine.

INTRODUCTION

In this study we study the role of neostigmine in nonmechanical bowel obstruction either it may be due to post operative ileus or may be due to some severe illness like pancreatitis and liver abscess or may be post head injury or may be in patients of Blunt Trauma Abdomen

with hemoperitoneum due to solid organ injury without hollow viscus injury.

Post operative ileus is mainly due to factors that disrupt the normal coordinated propulsive motor activity of intestine^[1,2,3]. Normally post operative ileus (physiological) generally lasts for 24 hours in small intestine upto 48 hours in the stomach and upto 72 hours in the colon^[2,4,5]. In nonmanipulated area during surgery peristalsis comes earlier than manipulated one.^[6,7] When GI motility will not return to normal within physiological time limit known as pathological ileus.^[8,9]

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In post operative ileus normal bowel function can be affected by three main mechanism: neurogenic ,inflammatory mediators and gastrointestinal hormones^[10] anaesthetic drugs and manipulation of bowel affect one or more of these mechanism.

In GI system parasympathetic system increase gut motility while sympathetic system inhibit gut motility,intrinsic nervous system of colon is different it lacks gap junctions ,the colon does not exhibit synergistic peristaltic waves . we all know that recovery of bowel motility occurs in a stepwise manner ,small intestine first than stomach and the colon last. After major surgeries sympathetic nervous system tends to be more active than parasympathetic one which causes ileus.^[11]

In postop case of adhesiolysis we purposefully give neostigmine after 24 hrs to prevent further adhesion formation by giving bowel motility.

In cases of Blunt Trauma Abdomen with hemoperitoneum due to solid organ injury like Grade 1or 2 Liver or Renal laceration without hollow viscus injury which were managed conservatively some patients developed abdominal distention post injury day 3or4 due to pseudo obstruction.

In rare cases acute pancreatitis is also associated with colonic obstructions,and it does so mainly at splenic flexure and transverse colon ^[12]. Main cause of bowel obstruction in acute pancreatitis is retroperitoneal inflammation. Proximity of bowel loops to anterior surface of pancreas leads to extravasation of enzymes into ^{bowel} loops that mechanically obstruct bowel pathways^[13].

Besides it many other severe illnesses causing parotinitis like appendicitis, liver abscess,splenic abscess also show association with paralytic ileus .

In post head injury patient some patients on post injury day3 develop abdominal distention, constipation with absent bowel sounds

METHOD

Patient with non mechanical bowel obstruction who were 18 years of age or older were recruited for study between March 2017 and April 2018 from inpatient surgical wards of SVBP Hospital Meerut. To be eligible for the study patient had to have a CECT whole abdomen done to rule out any mechanical cause

of obstruction. Patient were enrolled in the study if clinical examination and abdominal radiographs failed to improve after 48 hours of conservative management that included NPO, naso gastric suction IV fluids and electrolyte replacement.

Exclusion criteria included a baseline heart rate of less or equal to 60 beats per minute; signs of intestinal perforation, with peritoneal signs on physical examination or free air under right dome of diaphragm on x ray abdomen AP erect; active bronchospasm ; treatment with drugs such as cisapride or metoclopramide (ptokinetic) in the 24 hours before neostigmine injection.

All patients receive 2.5 mg of neostigmine IV (diluted in 10 ml normal saline) over a period of five minutes. All patients were monitored by electrocardiography; atropine and glycopyrolate was kept ready on bedside and 1.0 mg was given intravenously in case of symptomatic bradycardia. Patients were instructed to remain in supine position for at least 30 minutes after the injection. Vital signs like BP,pulse,saturation were recorded immediately before the injection and five minutes and three hours afterward.

The doctor administering the infusion monitored the clinical response for 30 minutes after the injection. The maximal abdominal circumference and the diameter of dilated bowel loops on plain radiographs were measured before and three hours after injecting neostigmine.

RESULTS

In our study we retrospectively analyzed 45 patients. Out which 28 were male and 17 patients were female. Male to female ratio was 1.65:1. The patient ranged from 18 years to 70 years

Table 1. demographic characterstcs of the study group(n=45)

GENDER	
MALE	28
FEMALE	17
AGE	
18-30	08
31-40	10
41-50	14
51-60	11
61-70	02

Table 2. Showing various no. of patient of different diseases taking for study.

Study population (n=45)	
Postoperative patients	
POC of Adhesiolysis	
10 Ileostomy	08
Post BTA with hemoperitoneum d/t solid organ injury without hollow viscus injury	05
Other severe illness	
Pancreatitis	12
Liver abscess	08
Post head injury	02

27 patients showed improvement in clinical symptoms (passed flatus and faeces) after 3 to 5 minutes, 12 patients showed improvement in 5 to 10 minutes and 4 patients showed improvement in more than 10 minutes. 2 patients were not improved till one hour after injecting neostigmine.

Table 3. Showing response time of neostigmine in various patient

N	RESPONSE TIME (in minutes)
27 (~60%)	3-5
12	5-10
04	>10
02	No response

Table 4. Showing result of study

RESULT	
Clinical response –no.(%)	43(~95%)
Change in abdominal circumference-cm	
Median	-7
Range	-1 to -26

Change in small bowel diameter -cm	
Median	-1.5
Range	-0.5 to -2
Change in diameter of colon –cm	
Median	-4
Range	-1 to -12

Symptomatic bradycardia was seen in 3 (~7%) patient. In two patient pulse rate was decreased upto 36. Abdominal pain was the most common side effect noticed in 23 (~51%) of patients, excessive salivation (~30%) and vomiting (~20%) were second and third most common side effect respectively.

DISCUSSION

Neostigmine is acetylcholinesterase inhibitor, it was first synthesized by Aeschlimann and Reinert in 1931^[14]. Use of neostigmine is well documented in acute colonic pseudo-obstruction but its use in other causes of nonmechanical bowel obstruction is still a matter of debate. According to study done by Raul Guillermo et al in sep 2014 published in ANNALS OF MEDICINE SURGERY in June 2014, neostigmine effectiveness to resolve ACPO with only one dose averaged was 89.2% comparing with our study for all causes of non mechanical bowel obstruction its value is 95% reflecting its usefulness in nonmechanical causes of paralytic ileus.

In this study pain abdomen was also the most common side effect occurred in 53.1% cases other side effects were excessive salivation in 31.1% cases, vomiting in 15.6% cases. In our study most common side effect was also pain abdomen occurred in 51% of cases and other side effects excessive salivation (30%) and vomiting (20%)

In a study published in Critical Care Medicine: January 2018 - Volume 46 there was bradycardia in 7% of patients none requiring atropine therapy. In our study bradycardia occurred in 7% cases with no requirement of atropine.

Hallerback et al.^[15] conducted a randomised study on patients with ileus following open cholecystectomy. Patients were treated with neostigmine and propranolol (n = 16), neostigmine (n = 18) or were placebo-treated controls (n = 17). Mean time to passage of faeces and

flatus was significantly reduced with neostigmine and propanol compared to the control group. In our study the response time is 3 – 5 minutes in 60% of cases reflecting that use of neostigmine significantly reduces response time.

CONCLUSION

On the basis of our findings we can suggest that it is feasible to use neostigmine in non mechanical bowel obstruction.

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