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RESEARCH ARTICLE

LIQUID PARAFFIN ADMINISTRATION IN PEDIATRIC ADHESIVE BOWEL OBSTRUCTION- CAN IT REPLACE SURGERY?

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PLACE OF WORK- Department of Pediatric Surgery, SMS Medical College, Jaipur.

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ABSTRACT:
Aims: To compare the intraoperative efficiency and safety in the form of phaco power, phacotime,total surgical Purpose: Adhesive small bowel obstruction is a common surgical problem, yet there has been no standard protocol for its management. In the absence of bowel strangulation, majority of adhesive obstruction cases can be treated conservatively. The purpose of this study was to evaluate the possible use of liquid paraffin in the management of adhesive small bowel obstruction conservatively in the pediatric age group, and its safety and effectiveness in reducing the hospital stay and operative intervention rate.
Methods: This prospective randomized study was conducted in 60 patients who had diagnosed post operative adhesive small bowel obstruction , attending the department of Pediatric Surgery, SMS Medical College and Attached hospitals Jaipur, during the period between October, 2014 to March, 2016. After stabilization, patients were randomly divided into two equal groups. Patients in group-I received conservative treatment as per protocol and group-II received liquid paraffin through nasogastric tubing in addition to the conservative treatment. Both groups were statistically similar in age, sex, and sample size. Serial clinical and radiological monitoring was performed. If symptoms of peritonitis developed or if the obstruction did not resolve spontaneously after seventy two hours of admission, a laparotomy was performed. The duration of hospital stay, time between admission and first oral feed, passage of stool/flatus was compared in the two groups using standard statistical methods.
Results: Average time for passage of flatus or stool, resolution of abdominal signs and duration of hospital stay were shorter in group II as compared to the group I. However the differences did not reach statistical significance levels. No serious adverse reaction was noted after liquid paraffin administration.
Conclusion: The use of liquid paraffin in adhesive small bowel obstruction is safe and reduces the need for surgical intervention.

KEY WORDS: Liquid paraffin, post operative adhesions, nasogastric feed, osmotic laxative

INTRODUCTION

Abdominal surgery performed for different indications often comes at a price. Postoperative adhesive obstruction is a common etiology leading to readmission of patients with enhanced morbidities[1]. Appendectomy, stoma formation and closure, nissen fundoplication, and ladd's procedures are the most common procedure leading to adhesive small bowel obstruction[1,2]. The onsets of adhesive complications vary with majority of pediatric age patients being readmitted with obstructive symptoms within an year of the initial surgery[3]. Various

conservative means of managing acute small bowel obstruction have been reported. The commonest protocol includes nasogastric tube suction and fluid resuscitation, and radiological studies with water-soluble contrast agents, such as gastrografin, which may serve to determine the need for surgery[3,4,5]. Different studies in adults have compared modalities and found gastrograffin to be helpful in both diagnostic and therapeutic terms. It is generally believed that the osmotic action of gastrograffin serves to relief obstruction and thereby avoids surgery[6,7]. The reported success rates vary from 40 to 70 percent[8,9]. Pediatric small bowel obstructon are generally managed as a surgical emergency with less reports available regarding conservative usage of osmotic agents. Probably the increased likelihood of pediatric patients to land up in perforation has avoided the need for conservative management so far[10,11]. We have attempted to establish a modified protocol for these patients by usage of an inert osmotic agent, liquid paraffin to treat the pediatric patients conservatively, thereby avoiding the need for surgical morbidity.

MATERIALS AND METHODS

This prospective study was conducted in the department of Pediatric Surgery, SMS Medical college and Attached Hospitals, Jaipur. Sixty patients between 1day and 16 years of age with diagnosed postoperative adhesive intestinal obstruction were included in this study from October 2014 to March 2016. A detailed history, including information on previous abdominal surgery and clinical examination was performed. Typical features of intestinal obstruction included colicky abdominal pain, vomiting, abdominal distention and empty rectum on digital rectal examination. Plain abdominal X-ray and ultrasonography of abdomen confirmed the diagnosis.

The exclusion criteria included patients with evidence of peritonitis, history of intra-abdominal malignancy, abdominal radiotherapy, chemotherapy, renal and/or liver failure and immunocompromised state. After proper consent from the patients/parents or guardians, patients were randomized into two study groups with thirty patients in each group.

The group I patients were treated as per standard protocol. This included nasogastric aspiration, fluid resuscitation and monitoring of abdominal signs. Patients in group II also received the same management with addition of liquid paraffin given through nasogastric tube after two hours of nasogastric tube aspiration. The tube was clamped for three hours. The dose used was 1ml per kilogram per dosage given twice a day. Maintenance fluid was given throughout the procedure. Serial clinical and radiological monitoring was performed every eight hours over the next seventy two hours in both the groups. A clinical improvement was defined as reduction of abdominal distention, decreased abdominal pain, decreased nasogastric tube output and passage of flatus or stool. A radiological improvement was defined as decrease in number of dilated bowel loops or diameter of dilated small bowel on X ray imaging. The improvements in both the groups were compared and correlated in statistical terms as mentioned below. If symptoms of peritonitis developed or if the obstruction did not resolve spontaneously after seventy two hours of admission, a laparotomy was performed. Complete resolution of obstruction was confirmed when sign and symptoms subsided and liquid diet started. The clinical improvement (CI), radiological improvement (RI), duration of hospital stay (DUR), time between admission and first oral feed (TIME) was statistically compared in the two groups.

RESULTS

Sixty patients of postoperative adhesive obstruction were randomized into two groups. Group I constituted twenty males and ten female patients. Group II had sixteen males and fourteen female patients. The same surgical team evaluated and intervened on all patients. The age group was between one day and sixteen years. The commonest age incidence was between two to six years (38%). All the patients had previously performed abdominal procedures. Exploration for appendicular perforation was the commonest previously performed procedure accounting for 36% patients, followed by band obstruction and intussusception in 15% each respectively. The result showed increase in clinical improvements and radiological improvements in the group treated with nasogastric liquid paraffin. A clinical improvement was defined as reduction of abdominal distention, decreased abdominal pain, decreased nasogastric tube output and passage of flatus or stool. A radiological improvement was defined as decrease in number of dilated bowel loops or diameter of dilated small bowel on X ray imaging. The difference between the two groups did not reach statistical significance. The mean duration of hospital stay was 8.3 days in group I and 5.2 days in group II. Patients not improving in both the groups after seventy two hours of conservative therapy underwent exploratory laparotomy. This included 10 patients in group I (33%) and 7 patients in group II (24%). In patients who responded to conservative therapy, the time to oral feed was 4 days in group I and 3 days in group II.

Table 1- patient profile with respect to age groups and sex

AGE in years	No of patients	SEX	No of patients
0-2	17	Male	36
2-6	22	Female	24
6-12	14		
12-16	7		

Table 2- Patient profile with respect to surgeries performed

SURGERY	No of patients	SURGERY	No of patients
Appendectomy	22	Bands	9
Intussusception	8	Meckels perforation	4
Colostomy closure	6	Malrotation	5
Ileal atresia	2	Obstructed hernia	1
Duodenal atresia	2	NEC	1

Table 3- statistical correlation of clinical and radiological improvements between the control (Group I) and experimental (Group II) groups.
Both the associations are statistically non significant as p value is more than 0.05 in both associations.

	GROUP I n=30	GROUP II n=30	p value
Clinical improvement	20 (66%)	23 (76%)	0.566
Radiological improvement	18 (60%)	24 (80%)	0.1590

DISCUSSION

'A burnt child dreads the fire'. Re exploration in abdominal cases have often proved to be a nightmare among surgeons. Postoperative adhesions still continue to be a common cause of small bowel obstruction. This may follow almost any type of abdominal surgery. Various measures have been suggested to reduce the incidence of adhesions post surgery, with different outcomes[1,2,9]. Most of the studies on conservative management of small bowel obstruction have focused on the adult population with favorable outcomes. The success rates have been mentioned between 73 to 90%[9,11,12]. The duration of administration of the agents have been variable. A large number of workers have mentioned the use of orally administered gastrograffin. Some studies used hyperosmolar contrast media for diagnostic and therapeutic purposes[9,13,14]. The duration of giving conservative therapy before embarking on surgery has been variable but largely determined by clinical and radiological signs.

Liquid paraffin has been used used for the management of childhood constipation in addition to lactulose and other osmotic laxatives. Liquid paraffin has been traditionally considered as a lubricant or stool softener[15]. The mechanism of action in post-operative adhesiolysis is unclear. Probably, the lubricant action serves to increase intestinal peristalsis and provide better passage of gut contents. This helps to relieve the obstruction. It is however, not an osmotic laxative and does not increase the bulk of stool contents. The popularity of liquid paraffin stems from its tolerability, ease of titration and ability to administer large dosages[14,15]. The earliest mention of liquid paraffin comes from Sir W. Arbuthnot Lane, of Guy's Hospital in 1913, who recommended it as a treatment for stasis and chronic constipation[16].

Studies using lactulose and gastrograffin for relieve of obstruction have been complicated by the development of dehydration and electrolyte imbalances particularly in children. Liquid paraffin stands as a better option for increased and prolonged administration without hampering the hydration status of the patients[15,17]. Tolia et al reported that liquid paraffin is less efficacious than oral lavage solution to relieve disimpaction. However, liquid paraffin had better tolerance and compliance compared to polyethylene glycol[18]. A randomized direct comparison of liquid paraffin with other agents has not been done.

The early concerns with liquid paraffin usage has been the alteration in fat soluble vitamin absorption. Ballantine and colleagues, however in a study of prothrombin time, serum retinol, and α tocopherol concentrations, have not found any significant differences among 19 children receiving liquid paraffin and control patients[19]. In infants, a risk of lipoid pneumonia has been suggested[14,20]. Our administration of liquid paraffin by nasogastric route is believed to prevent this complication as none of the infants administered developed chest complications following discharge

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