Original Article

Appendicectomy

Postoperative Mean Pain Score of Closure Versus Non Closure of Peritoneum in Children after Open Appendicectomy

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ABSTRACT

Objective: To compare postoperative mean pain score of closure versus non closure of peritoneum in children after open appendicectomy.

Study Design: Randomized controlled trial study

Place and Duration of Study: This study was conducted at the Department of Surgery, District Headquarters Teaching Hospital, Sahiwal from December 2015 to March 2017.

Materials and Methods: Patients were divided into two groups by lottery method. Group A: Non closure of peritoneum. Group B: Closure of peritoneum. During surgery, all the steps in both groups were same except non closure of peritoneum in Group A. Postoperatively patients were assessed for pain score using visual Analogue scale score at day 0, day 1 and day 2 X 4 hourly.

Results: Of these 100 study cases, 55 (55%) were boys while 45 (45%) were girls. Mean age of our study cases was noted to be 9.38 ± 1.91 years (with minimum age was 6 years while maximum age was 12 years). Mean weight of our study cases was noted to be 21.94 ± 3.32 kg (with minimum weight of our study cases was 17 kg while maximum weight was 28 kg). Obesity was present in 12 (12%) of our study cases. Pain control was noted in 85 (85%) of our study cases. Pain control was 78 % in group A while it was seen in 92 % in group B (p=0.028). Mean visual analogue score (VAS) in our study was 27.11 ± 8.50 mm, in group A mean VAS was 34.36 ± 4.61 mm and 19.86 ± 4.18 mm in group B.

Conclusion: Our study results support use of non-closure of peritoneum as it provides good pain relief in children with acute appendicitis after open appendicectomy. Visual analogue score was significantly less in patients with non-closure of peritoneum compared with closure of peritoneum. Non – closure of peritoneum was associated with less use of analgesic drugs and shorter hospital stays compared with closure of peritoneum.

Key Words: Acute appendicitis, visual analogue score, closure of peritoneum.

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INTRODUCTION

Appendicitis is one of the most common acute surgical condition of the abdomen. The clinical signs and symptoms of acute appendicitis were first reported by Fitz in 1886. Approximately 7% of the population suffer from acute appendicitis during their life time. Appendicitis alone constitutes 10% of all emergency abdominal surgery.[1,2] It is regarded as uncommon event during early of life of children with high magnitude of the disease being reported in second decade of life and involves varying range of clinical presentations[3-5]. Diagnosis of appendicitis in children may also be overshadowed by various other underlying medical illnesses.

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The most common misdiagnosis is gastroenteritis as 33-41% patients of appendicitis present with history of diarrhea thus complicating its management. In children less than 5 years of age; pain is the most commonly reported symptom along with fever, vomiting, anorexia and diarrhea[6,7]. Focal tenderness is reported in 61% children, guarding in 55% children, diffuse tenderness in 39%, rebound in 33% and mass in 6%. It is very rate in neonates but associated with very high mortality rates and abdominal distension is the major clinical presentation. Early Diagnosis decreases chances of morbidity followed by appropriate management technique[8-11].

Appendicectomyis one of the most commonly performed procedure in children. It is usually the first procedure a surgeon performs. Routinely during appendicectomy, the abdomen is opened and then closed in a reverse order layer by layer including peritoneum, abdominal wall muscles and skin. There is a controversy regarding closure of peritoneum after abdominal surgery. Many studies have been conducted in gynaecology and obstetrics[(12-14)] that show benefits of non closure of peritoneum over its closure[(3-9)].However convincing data regarding closure of peritoneum after

appendicectomy is lacking. A study conducted by Suresh et al [10] reported mean visual analogue scale (VAS) score was 35.54 ± 4.92 mm in closure group while it was 28.21 ± 5.04 mm in non-closure group. Another study by farooq et al[(11)] has also shown that number of pain complaints decrease in those who are in non closure group with p value of <0.05.

These studies gives a conclusive evidence regarding benefits of closure versus non closure of peritoneum after appendicectomy in adults but there is no such study has been conducted in children.

This study was done to compare the effects of closure versus non closure of peritoneum on post-operative outcomes in terms of pain: the parameters being pain score and analgesic requirement. This study was first of its kind in Pakistan.

MATERIALS AND METHODS

This was a randomized controlled trial. Study which was conducted in Department of Surgery, District Headquarters Teaching Hospital, Sahiwal from December 2015 to March 2017. All the children of age range between 6 to 12 years (both boys and girls) undergoing appendectomy for acute appendicitis with Alvorado score of >7 were taken in our study. Patients with perforated appendix, patients with appendicular mass and appendicular abscess and patients with other abdominal pathology e.g. Meckel,s diverticulum, ovarian cyst were excluded from our study. Patients were divided into two groups by lottery method. Sample size is 100 patients (50 in each group), Sample size has been calculated by Epi-info Software of the CDC, USA while taking mean postoperative VAS score in closure group 32.54 ± 4.92 mm and 28.21 ± 5.04 mm in non closure group[10]. Group A: Non closure of peritoneum. Group B: Closure of peritoneum. During surgery, all the steps in both groups were same except non closure of peritoneum in Group A. Postoperatively patients were assessed for pain score using visual Analogue scale score at day 0, day 1 and day 2 X 4hourly. The intensity of pain depends upon magnitudes recorded for all patients using Analogue pain scale after surgery by on duty doctor. Post operatively patient was given Intravenous Toradol 0.5mg/kg 8 hourly. If the pain score was more than 40mm, patient was given additional dose of analgesia. In order to eliminate bias and allow for comparability the study was randomized and single blind.

The collected data was entered and analyzed using SPSS version 21 through its statistical program. The variables were analyzed using simple descriptive statistics, calculating mean and standard deviation for numerical values e.g. age and pain score. Frequencies and percentages were calculated for qualitative variables gender, age groups and pain score was compared by applying t test.

RESULTS

Our study included a total of 100 study cases who met inclusion criteria of our study. Of these 100 study cases, 55 (55%) were boys while 45 (45%) were girls. Mean age of our study cases was noted to be 9.38 ± 1.91 years. Mean age of boys was noted to be 9.36 ± 1.63 years while that of girls was noted to be 9.40 ± 2.22 years (p = 0.925). Our study results have indicated that majority of our study cases i.e. 51 (51%) were aged 10 – 12 years of age. Mean weight of our study cases was noted to be 21.94 ± 3.32 kg (with minimum weight of our study cases was 17 kg while maximum weight was 28 kg). Most of our study cases i.e. 58 (58%) had weight more than 20 kg. Obesity was present in 12 (12%) of our study cases. Pain control was noted in 85 (85%) of our study cases. Pain control was 78 % of our study cases in group A while it was seen in 92 % in group B (p=0.028). Mean visual analogue score (VAS) in our study was noted to be 27.11 ± 8.50 mm (with minimum VAS was 12 mm while maximum VAS was 42 mm).

Table No.1: Distribution of visual analogue score among study cases. (n = 100)

Visual analogue score (In mm)	Group A		Group B	
	Mean	**SD**	**Mean**	**SD**
	34.36	4.61	19.86	4.18
Total	**27.11 ± 8.50 mm**			

***p=0.000**

Table No. 2: Stratification of pain control with regards to gender. (n = 100)

Gender	Pain control		P – value
	Yes (n=85)	**No** (n=15)	
Male (n=55)	40	15	**0.000**
Female(n=45)	45	00	
Total	**100**		

Table No. 3: Stratification of pain control with regards to age. (n = 100)

Age	Pain control		P – value
	Yes (n=85)	**No** (n=15)	
6 – 9 Years (n=49)	45	04	**0.092**
More than 9 Years (n=51)	40	11	
Total	**100**		

Table No. 4: Stratification of pain control with regards to obesity. (n = 100)

Obesity	Pain control		P – value
	Yes (n=85)	**No** (n=15)	
Yes (n=12)	03	09	**0.000**
No (n=88)	82	06	
Total	**100**		

Table No. 5: Stratification of mean visual analogue score with regards to gender in both groups. (n = 100)

Gender	Groups	VAS		P value
		Mean	SD	
Male (n=55)	Group A(n=29)	34.24	5.33	**0.000**
	Group B(n=26)	11.96	4.30	
Female (n=45)	Group A(n=21)	34.52	3.50	**0.000**
	Group B(n=24)	19.75	4.15	

Table No.6: Stratification of mean visual analogue score with regards to age in both groups. (n = 100)

Age	Groups	VAS		P value
		Mean	SD	
6 – 9 Years (n=49)	Group A (n=24)	31.08	3.68	**0.000**
	Group B (n=25)	21.16	4.24	
More than 9 years (n=51)	Group A (n=26)	37.38	3.07	**0.000**
	Group B (n=25)	18.56	3.77	

Table No. 7: Stratification of mean visual analogue score with regards to gender in both groups.

Weight	Groups	VAS		P value
		Mean	SD	
Up to 20 Kg (n=42)	Group A(n=21)	31.81	3.68	**0.000**
	Group B(n=21)	20.05	3.68	
More than 20 kg (n=58)	Group A(n=29)	36.21	4.37	**0.000**
	Group B (n=29)	19.72	4.58	

Table No. 8: Stratification of mean visual analogue score with regards to obesity in both groups. (n = 100)

Obesity	Groups	VAS		P value
		Mean	SD	
Yes (n= 12)	Group A (n=07)	40.86	1.06	**0.000**
	Group B (n=05)	20.40	2.19	
No (n= 88)	Group A (n= 43)	33.30	4.06	**0.000**
	Group B (n=45)	19.80	4.36	

DISCUSSION

Acute appendicitis is the one of the commonly performed urgent surgical procedure in childhood which may have a lifetime incidence of 7%. Typical presentations of acute appendicitis may include periumbilical pain, nausea, and right lower quadrant pain which is followed by vomiting and fever[12-15]. These characteristics are seen in only half of adults, however, and even less commonly in children. This study was conducted to compare mean visual analogue score in closure of peritnoneum after appendicectomy versus non-closure of peritoneum in children with acute appendicitis.

Our study included a total of 100 study cases who met inclusion criteria of our study. Of these 100 study cases, 55 (55%) were boys while 45 (45%) were girls. This male gender predominance has already been reported in different studies. A study from Multan by Hussain et al [16] also reported 63.33 % boys presenting with acute appendicitis. These results are in compliance with our study results. Another study from Peshawar by Rehman et al [17] also reported 75 % male gender preponderance which is consistent to our study results. Mughal et al [18] also reported 76 % male gender predominance which is similar to that of our study results.

Mean age of our study cases was noted to be 9.38 ± 1.91 years (with minimum age was 6 years while maximum age was 12 years). Mean age of boys was noted to be 9.36 ± 1.63 years while that of girls was noted to be 9.40 ± 2.22 years (p = 0.925). Our study results have indicated that majority of our study cases i.e. 51 (51%) were aged 10 – 12 years of age. Hussain et al [16] from Multan also reported that majority of patients with acute appendicitis in age group ranging from 5 – 10 years of age which is similar to that of our study results. Another study by Latif et al[19] also reported 10.5 years mean age of children presenting with acute appendicitis which is close to our study findings. A study from Peshawar by Rehman et al[17] also reported similar results. Mughal et al [18] also reported same age range (6 – 14 years) for the presentation of acute appendicitis.

Mean weight of our study cases was noted to be 21.94 ± 3.32 kg (with minimum weight of our study cases was 17 kg while maximum weight was 28 kg). Most of our study cases i.e. 58 (58%) had weight more than 20 kg. Obesity was present in 12 (12%) of our study cases.

Closure of peritoneum at lower abdominal surgery that may be an appendectomy have not any additional advantage, rather is associated with more complications. Moreover, non - closure of peritoneum at lower abdominal surgery and appendectomy is associated with reduced use of analgesics and shorter hospital stay. Pain control was noted in 85 (85%) of our study cases. Pain control was 78 % of our study cases in group A while it was seen in 92 % in group B (p=0.028). Mean visual analogue score (VAS) in our study was noted to be 27.11 ± 8.50 mm (with minimum VAS was 12 mm while maximum VAS was 42 mm). A study conducted by Suresh et al [10] reported mean visual analogue scale (VAS) score was 35.54 ± 4.92

mm in closure group while it was 28.21 ± 5.04 mm in non-closure group. These results are similar to that of being reported in our study. Another study by farooq et al[11] has also shown that number of pain complaints decrease in those who are in non closure group with p value of <0.05. These findings are also in compliance with our study results.

CONCLUSION

Our study results support use of non-closure of peritoneum as it provides good pain relief in children with acute appendicitis after open appendicectomy. Visual analogue score was significantly less in patients with non-closure of peritoneum compared with closure of peritoneum. Non – closure of peritoneum was associated with less use of analgesic drugs and shorter hospital stays compared with closure of peritoneum.
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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