

Clinicopathological Study of Acute Appendicitis in a District Level Hospital

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Appendicitis is a common clinical condition worldwide and commonest abdominal surgical emergency. It is still a clinical diagnosis despite advances in technology, there is no laboratory test or examination with sufficient and, abdominal pain, vomiting, fever followed by local tenderness at the right iliac fossa can be sufficient for the surgeon to proceed to laparotomy. Major errors in management are made frequently and the condition is associated with significant morbidity and mortality. Present study conducted to find out the clinical presentation, per operative findings and histopathological features of acute appendicitis among Bangladeshi population in a district level hospital. A total of 150 cases of acute appendicitis underwent appendectomy operation and histopathology of the appendices at Surgery Department of Mymensingh Medical College Hospital and Islamia General Hospital (private) in Mymensingh district, Bangladesh between the the periods of January 2013 to December 2015 were included in the study. Mean±SD of age of the patients was 18.58±12.03 years with a range of 8 to 70 years. Highest number of patients were in the age group of 11 to 20 years (38.7%) followed by age group of 21 to 30 years (34.0%). Among the patients 110 (73.3%) were male and 40 (26.7%) were female. In the present study 32.0% were presented with anorexia, 34.7% were presented with nausea, 50.7% were presented with vomiting. All patient presented with abdominal pain among them 122 (81.3%) had initial pain in the peri-umbilical region. Fever $\geq 100^{\circ}\text{C}$ present in 72.0%, 80.0% had WBC count $\geq 10,000/\text{cmm}$ and 72.7% had neutrophil percent count $\geq 75\%$. In the present study among the patients signs of RIF tenderness, abdominal rigidity, Psoas test, Obturator test, rebound tenderness and Rovsing's sign were 100.0%, 56.0%, 72.0%, 20.0%, 66.0% and 36.0% respectively. In operative findings of appendix 53.3% were inflamed, 24.0% were perforated, 11.3% were gangrenous and 8.7% were grossly normal appendix. Total 16 (10.7%) patients were developed different complications with one month of surgery. These were wound sepsis (3.3%), postoperative ileus (2.0%), peritonitis (0.7%), chest infection (1.3%), iatrogenic small bowel injury (0.7%), wound dehiscence (1.3%) and faecal fistula (1.3%). All the specimen of operated appendices were send for histopathological examination. Among the patients 62 (41.4%) had acutely inflamed, 53 (35.3%) had perforated, 18 (12.0%) had gangrenous and 15 (10.0%) had normal appendix and other 2 (1.3%) had faecolith. Clinical presentation, per operative findings and histopathological features among Bangladeshi population in a district level hospital comparable with different studies published in national and international journals.

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Introduction

Appendicitis is a common clinical condition worldwide and commonest abdominal surgical emergency with a lifetime incidence of 7% in western countries.¹⁻⁷ It is the most common surgical emergency and the decision for appendectomy is usually based on clinical signs and symptoms.^{8,9} Major errors in management are made frequently and the condition is associated with significant morbidity and mortality.^{4,5,10} Despite advances in technology, there is no laboratory test or examination with sufficient specificity and sensitivity to diagnose appendicitis consistently.⁹ It is known to be the disease of the younger age groups with only 5-10% of cases occurring in the elderly population.^{1,11} However, the incidence of the disease in elderly age group seems to be rising due to recent increase in the life expectancy.¹ It is commoner in males than in females.¹¹

The accuracy of a clinical diagnosis is the first challenging step for every clinical practice. Good treatment is usually the result of a good diagnosis with high accuracy. In some emergency situations, which need treatment or surgery, rapid detection plays a vital role in the treatment outcome.¹² The principal presenting complaint of patients with acute appendicitis is abdominal pain. Murphy was the first to describe the sequence of colicky central abdominal pain followed by vomiting and migration of the pain to the right iliac fossa.^{13,14} This classical presentation is only seen in approximately 50% of patients. The history of pain is usually 24 h of colicky peri-umbilical pain followed by migration of the pain to the right iliac fossa with a progression to a more constant severe pain.^{14,15} Abdominal pain, vomiting, fever followed by local tenderness at the right iliac fossa can be sufficient for the surgeon to proceed to laparotomy.⁷ Specialist investigations are rarely needed to make the

diagnosis of appendicitis as the diagnosis is predominantly clinical. The judicious use of simple bedside tests and laboratory markers of inflammation can provide additional evidence to support the diagnosis of acute appendicitis and exclude important differentials.¹⁴ Delay in treatment of acute appendicitis causes lot of complications. On the other hand, to reduce complications prompt diagnosis and treatment results lot of negative laparotomy (as high as 25%).⁷

As the acute appendicitis is a clinical diagnosis, so it's impossible to have a definitive diagnosis by gold standard (histopathology) pre-operatively.^{3,16} Through history and clinical examination still remains the mainstay for the diagnosis, but misdiagnosis and negative appendectomy still do occur at quite a high rate.³ Admitting diagnosis was based on history and clinical findings. These were defined as fever $>38^{\circ}\text{C}$, increased WBC $>10,000/\text{cmm}$ and right lower abdominal pain and per operative diagnosis of acute appendicitis was made on the appearance of its wall, surrounding inflammation and oedema with or without the presence of intra abdominal free fluid.¹ Patient's symptoms frequently disappear post operatively even with negative histopathologies.⁹ Present study conducted to find out the clinical presentation, per operative findings and histopathological features among Bangladeshi population in a district level hospital. It will enrich our knowledge and will be beneficial for patients management.

Methods

Total 150 cases of acute appendicitis underwent appendectomy operation and histopathology of the appendix at Surgery Department of Mymensingh Medical College Hospital and Islamia General Hospital(private) in Mymensingh district, Bangladesh between the the periods of

January 2013 to December 2015 were included in the study. Irrespective of age and sex of the patients those who fulfilled the diagnostic criteria based on clinical and laboratory parameters, undergone operative treatment and histopathology of the appendix were included in the study. Patient who was previously admitted for appendicular lump and patient undergone incidental appendectomy were excluded from the study. All patients were evaluated preoperatively by history, physical examination and appropriate laboratory investigation and recorded in predesign data collection sheet. Appendectomy was performed under general anaesthesia in all the patients by maintaining standard operating procedure. Per operatively condition of the peritoneal cavity and appendix was recorded. After methodical appendectomy all specimens were sent for histopathological examination. A meticulous postoperative management and follow up were done in all cases during the period of staying in the hospitals. Parenteral antibiotics were replaced by oral form as soon as fluid was given by mouth and continued for 5 to 10 days. Fluid and electrolyte replacement was done on clinical assessment as well as serum electrolyte estimation in some selective cases. Early postoperative complications like haematoma and sepsis etc. were dealt with promptly. Majority patients were discharged on the 5th postoperative day after dressing changed and inspection and palpation of the wound. Patients who developed complication such as wound sepsis were managed by regular dressing and proper antibiotics and discharged after secondary closure of the wounds. Computer program, Statistical Package for the Social Sciences (SPSS 16) was used for statistical analysis.

Results

Total 150 cases underwent appendectomy operation were included in the study. Among

the patients 13 (8.7%) were in the age group of ≤ 10 years age, 58 (38.7%) were in the age group of 11 to 20 years, 51 (34.0%) were in the age group of 21 to 30 years, 14 (9.3%) were in the age group of 31 to 40 years, 9 (6.0%) were in the age group of 41 to 50 years, 3 (2.0%) were in the age group of 51 to 60 years and rest 2 (1.3%) were in the age group of ≥ 61 years. Mean \pm SD of age of the patients was 18.58 ± 12.03 years with a range of 8 to 70 years. Among the patients 110 (73.3%) were male and 40 (26.7%) were female (Table I). Out of 150 patients 48 (32.0%) were presented with anorexia, 52 (34.7%) were presented with nausea, 76 (50.7%) were presented with vomiting, 122 (81.3%) had initial pain in the peri-umbilical region, 108 (72.0%) had fever $\geq 100^{\circ}\text{C}$, 120 (80.0%) had WBC count $\geq 10,000/\text{cumm}$ and 109 (72.7%) had neutrophil percent count ≥ 75 (Table II). In the present study among the patients signs temp $\geq 100^{\circ}\text{C}$, RIF Tenderness, abdominal rigidity, psoas test, obturator test, rebound tenderness and Rovsing's sign were 72.0%, 100.0%, 56.0%, 72.0%, 20.0%, 66.0% and 36.0% respectively (Table III). In operative findings out of 150 patients 80 (53.3%) had inflamed, 36 (24.0%) had perforated, 17 (11.3%) had gangrenous and 13 (8.7%) had grossly normal appendix. Four (2.7%) had faecolith (Table 4). A total 16 (10.7%) patients were developed different complications with one month of surgery. These were wound sepsis (3.3%), postoperative ileus (2.0%), peritonitis (0.7%), chest infection (1.3%), iatrogenic small bowel injury (0.7%), wound dehiscence (1.3%) and faecal fistula (1.3%) (Table V). All the specimen of operated appendices were send for histopathological examination. Among the patients 62 (41.4%) had acutely inflamed, 53 (35.3%) had perforated, 18 (12.0%) had gangrenous, 15 (10.0%) had normal appendix and other 2 (1.3%) had faecolith (Table VI).

Table I: Distribution of age and gender of the respondents (n=150)

Age group(years)	Frequency	%
≤10	13	08.7
11-20	58	38.7
21-30	51	34.0
31-40	14	09.3
41-50	09	06.0
51-60	03	02.0
≥61	02	01.3
Gender		
Male	110	73.3
Female	40	26.7

Mean±SD (Range)= 18.58±12.03(8-70)

Table II: Distribution of clinical presentation and lab test of acute appendicitis*

Sign and symptoms	Frequency	%
Anorexia		
• Yes	48	32.0
• No	102	68.0
Nausea		
• Yes	52	34.7
• No	98	65.3
Vomiting		
• Yes	76	50.7
• No	74	49.3
Initial pain		
• Peri-umbilical	122	81.3
• Other	28	18.7
Fever		
• ≥100°C	108	72.0
• <100°C	42	28.0
W.B.C count		
• ≥10000/cumm	120	80.0
• <10000/cu mm	30	20.0
Neutrophil count (%)		
• ≥75	109	72.7
• <75	43	27.3

*Multiple responses

Table III: Comparison of signs with other published study*

Clinical signs	Frequency	%
Temp ≥100°C	108	72.0
RIF tenderness	150	100.0
Abdominal rigidity	84	56.0
Psoas test	108	72.0
Obturator test	30	20.0
Rebound tenderness	99	66.0
Rovsing's sign	54	36.00

*Multiple responses

Table IV: Distribution of per operative findings of appendix

Operative findings	Frequency	%
Inflamed	80	53.3
Perforated	36	24.0
Gangrenous	17	11.3
Grossly normal	13	08.7
Faecolith	04	02.7
Total	150	100.0

Table V: Distribution of complication within one month of surgery (n=27)

Complication	Frequency	%
No complication	134	89.3
Complication	16	10.7
• Wound sepsis	05	03.3
• Postoperative ileus (prolonged)	03	02.0
• Peritonitis	01	00.7
• Chest infection	02	01.3
• Iatrogenic small bowel injury	01	00.7
• Wound dehiscence	02	01.3
• Faecal fistula	02	01.3

Table VI: Distribution of histological findings

Histological Findings	Frequency	%
Acute inflammation	62	41.4
Perforated	53	35.3
Gangrenous	18	12.0
Normal	15	10.0
Faecoliths	02	01.3
Total	150	100.0

Discussion

Appendicitis is a common clinical condition worldwide and most common surgical emergency and the decision for appendicectomy is usually based on clinical signs and symptoms¹⁻⁹ and major errors in management are made frequently and the condition is associated with significant morbidity and mortality.^{4,5,10}

In the present study total 150 cases underwent appendicectomy operation and histopathology were included for analysis. Mean±SD of age of the patients was 18.58±12.03 years with a range of 8 to 70 years. In the present study more than two thirds patients were less than 30 years. Among them 13 (8.7%) were in the age group of ≤10 years age, 58 (38.7%) were in the age group of 11 to 20 years, 51 (34.0%) were in the age group of 21 to 30 years, 14 (9.3%) were in the age group of 31 to 40 years, 9 (6.0%) were in the age group of 41 to 50 years, 3 (2.0%) were in the age group of 51 to 60 years and rest 2 (1.3%) were in the age group of ≥61 years (Table I). Epidemiologic studies have shown that appendicitis is most common in the 10-29 years old age group^{7,17}. Appendicitis is known to be commoner in adolescents than it is in either children or young adults.¹¹ Appendicitis is known to be the disease of the younger age groups with only 5-10% of cases occurring in the elderly population. The incidence of the disease in this age group seems to be rising due to recent increase in the life expectancy.¹

Among the patients 110 (73.3%) were male and 40 (26.7%) were female (Table I). It is common in males than in females.¹¹ Oguntola et al. (2010)² in their study showed that 52.0% were males. Nshuti et al. (2014)¹⁸ in their study also reported that it is more common in male. Oguntola et al. (2010)² in their study reported that the highest incidence in males and females occurred in the second and third decades, respectively. Hoq and Hossain, (2001)⁷ in their study reported males are affected more commonly than the female with a male and female ratio of 3.16:1.

Among the patients 48 (32.0%) were presented with anorexia, 52 (34.7%) were presented with nausea, 76 (50.7%) were presented with vomiting, 122 (81.3%) had initial pain in the peri-umbilical region, 108 (72.0%) had fever ≥100°C, 120 (80.0%) had WBC count ≥10000/cumm and 109 (72.7%) had neutrophil percent count ≥75 (Table II). Hoq and Hossain, (2001)⁷ in their study reported anorexia, nausea and vomiting in 89% of cases and all patients present with abdominal pain. Nshuti et al. (2014)¹⁸ in their study reported that the predominant presenting symptoms were right iliac fossa pain (95%), nausea (80%), and vomiting (73%), with 63% of patients presenting 2 days after onset of symptoms. Fever was present in 15% and only 31% of patients gave a typical history of acute appendicitis of vague peri-umbilical pain.

In the present study among the patients signs temp ≥100°C, RIF tenderness, abdominal rigidity, psoas test, obturator test, rebound tenderness and Rovsing's sign were 72.0%, 100.0%, 56.0%, 72.0%, 20.0%, 66.0% and 36.0% respectively (Table III). In operative findings out of 150 patients 80 (53.3%) had inflamed, 36 (24.0%) had perforated, 17 (11.3%) had gangrenous 13 (8.7%) had grossly normal appendix and 4 (2.7%) had faecolith (Table IV).

Acute appendicitis with complications definitely increases the morbidity and mortality of the patients. The average morbidity with perforated appendicitis four times higher and average mortality is 11 times higher than the patients undergoing appendectomy with a normal acute appendicitis.⁷ In the present study 16 (10.7%) patients were developed different complications with one month of surgery. These were wound sepsis (3.3%), postoperative ileus (2.0%), peritonitis (0.7%), chest infection (1.3%), iatrogenic small bowel injury (0.7%), wound dehiscence (1.3%) and faecal fistula (1.3%) (Table V). Omari et al. (2014)¹ in their study reported that as compared to younger age group, elderly patients have more underlying diseases and sluggish bodily physiological reactions resulting in a higher rate of morbidity and mortality.

All the specimen of operated appendices were send for histological examination. Among the patients 62 (41.4%) had acutely inflamed, 53 (35.3%) had perforated, 18 (12.0%) had gangrenous and 15 (10.0%) had normal appendix. Other 2 (1.3%) had faecolith (Table VI). Nshuti et al. (2014)¹⁸ in their study reported the histology results showed perforated appendix with or without generalized peritonitis in 41 patients (29%) and normal appendix in 11% of cases. Hoq and Hossain, (2001)⁷ in their study found 6.66% patients had normal appendices on histopathology. Studies by Siberman, (1981),¹⁹ Law et al. (1976)²⁰ and Jamal et al. (1998)²¹ reported normal appendices in 14.7%, 11.0% and 13% patients respectively.

Conclusion

More than two third patients in the present study were younger age group, aged less than 30 years and male. Abdominal pain associated with anorexia, nausea and vomiting are the main presenting features of acute

appendicitis. More than seventy percent patients were presented with fever $\geq 100^{\circ}\text{C}$ and WBC count $\geq 10,000/\text{cumm}$. Right iliac fossa tenderness present in all patients in the present study. Histopathological finding showed acutely inflamed, perforated, gangrenous as well as normal appendix.

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