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Original Research Article

Appendix perforation: contributing risk factors

Gopal Chandra Pal[1], Raisa Enayet Badhan[2]*, M. Tanuwar Islam Chowdhury[3], Rubaiya Sharmeen Moushumi[4]

[1]Department of Hepatobiliary Surgery, Bangladesh Medical University (BMU), Dhaka, Bangladesh
[2]Department of Microbiology, National Institution of Burn and Plastic Surgery, Dhaka, Bangladesh
[3]Department of Urology, Shaheed Suhrawardy Medical College and Hospital, Dhaka, Bangladesh
[4]Department of Surgery, MH Samorita Hospital and Medical College, Dhaka, Bangladesh

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***Correspondence:**
Dr. Raisa Enayet Badhan,
E-mail: raisabadhan@gmail.com

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ABSTRACT

Background: Acute appendicitis is the most common abdominal surgical emergency. When it progresses to perforation, it leads to prolonged recovery and increased mortality. This study aims to identify risk factors for appendiceal perforation in the local population.
Methods: A hospital-based study was conducted at Faridpur Medical College Hospital from June 2014 to June 2015 on 200 patients diagnosed with appendicitis. Data were collected using structured forms and analyzed statistically.
Results: The majority of patients were aged 15-25 years (32.5%) and 26-35 years (28.5%). Perforation was more common at extreme ages. Low education levels (41.89% illiterate, 36.48% primary education) and poor socioeconomic status (42%) were significant risk factors. Among 200 cases, 74 (37%) had perforated appendicitis, while 126 (63%) had inflamed appendicitis. Delay in hospitalization increased the risk, with only 5.4% of perforated cases presenting on the first day. Common symptoms included abdominal pain (100%), nausea/vomiting (73.5%), fever (61%) and anorexia (64.5%). Right lower quadrant tenderness was present in all cases, while rebound tenderness and fever occurred in 94%. Leukocytosis (>10×10⁹/L) was observed in over half of the patients. Obstruction due to fecolith (72.5%) was the leading cause of perforation.
Conclusions: Appendiceal perforation is associated with delayed diagnosis, low socioeconomic status and obstruction. Timely intervention, better health awareness and risk factor prevention can reduce complications and improve patient outcomes. Proper clinical evaluation remains crucial for effective management.

Keywords: Acute appendicitis, Perforation, Risk factors

INTRODUCTION

Appendicitis is the most frequent abdominal surgical emergency.[1] Not all patients present in a usual way. Patients at the extremes of age have a higher mortality rate due to delayed presentation or inconspicuous indications. Specialist investigations should not cause a delay in decisive treatment. When identifying acute appendicitis, computed tomography is more sensitive and specific than ultrasonography.[1] Laparoscopic appendicectomy is becoming more popular and clinical studies indicate that it has some advantages over open surgery. Perioperative medications have been shown to reduce wound infections.[1] Although early data on the prevalence of appendicitis is scarce, the current information suggests that the disease peaked in developed countries in the early twentieth century and has been decreasing since.[2]

The disease is significantly less common in traditional civilizations and underdeveloped countries than in the West, although the frequency is rising as these countries

modernize. The reasons for the disease's shifting incidence are unknown, however they are likely related to dietary changes or exposure to intestinal parasites. Appendicitis was unlikely to be a major cause of disability or death over the majority of human history. Nonetheless, people continue to suffer from appendicitis and inflamed appendices can perforate or burst, resulting in peritonitis and death.[2] Acute appendicitis is the most common abdominal surgical emergency, with a lifetime frequency of 7%. Appendicitis is primarily a disease of young people, with only 5-10% of cases occurring in the elderly. However, the disease's incidence in this age range appears to be increasing as life expectancy has recently increased.[3] In comparison to younger age groups, older patients have more underlying disorders and slower physical physiological reactions, resulting in a higher prevalence of morbidity and mortality.[4,5]

Furthermore, the aberrant appearance and delay in seeking medical aid have been related with delayed diagnosis and treatment, resulting in high morbidity and fatality rates.[6,7] The prognosis for uncomplicated appendicitis is nearly identical in both young and old age groups. However, perforation significantly worsens the disease, resulting in increased rates of morbidity and mortality.

Typically, the patient expresses peri-umbilical colicky pain that worsens over the first 24 hours, becomes persistent and intense and spreads to the right iliac fossa. The first pain is referred pain induced by the midgut's visceral innervation, whereas the localized pain is caused by the parietal peritoneum becoming involved as the inflammatory process progresses. Constipation and nausea are common symptoms, as well as a loss of appetite. Profuse vomiting may suggest the development of widespread peritonitis following perforation, but it is rarely a significant symptom of mild appendicitis.

This traditional presentation might be affected by the patient's age and the appendix's anatomical position. Patients at the extremes of the age spectrum might be difficult to diagnose due to their non-specific presentation, which often includes minor clinical symptoms. Infants and young children frequently appear withdrawn and the elderly may present with perplexity. In such cases, there should be a high suspicion of acute appendicitis.

Despite advances in radiographic and laboratory examinations, diagnosing appendicitis remains difficult. Experienced clinicians can accurately diagnose appendicitis using a combination of history, physical examination and laboratory tests. Although most people with acute appendicitis are quickly recognized, the signs and symptoms might vary, making a definitive diagnosis challenging. This is especially true if the appendix is retrocaecal or retroileal.

The percentage of appendicectomies performed in which the appendix is later discovered to be normal ranges between 15 and 50%, with postoperative problems occurring in up to 50% of these patients.[8,9] A delay in diagnosing acute appendicitis increases the risk of perforation and peritonitis, as well as mortality. Given the foregoing, the current investigation was conducted to determine the risk factors for appendicitis perforation. The study's goal is to identify risk factors for appendix perforation among residents of this area. To find out the correlation between the risk factors and perforation of the appendix, to sketch out the disease pattern in our locality and to reduce the incidence of morbidity and mortality of perforation of appendix.

METHODS

Study design

This was a cross-sectional study

Study place

Department of Surgery, Faridpur Medical College Hospital, Faridpur

Study duration

The study duration was of One year (16th June 2014 to 15th June 2015)

Sampling

The Sample was selected from the population by purposive sampling technique.

Sample size

To calculate the sample size based on prevalence, here's the basic formula:

$n=Z^2\times P\times(1-P)/ d^2$

Where, n= required sample size, Z =Z-score, based on the desired confidence level (e.g., for a 95% confidence level, Z=1.96), P=estimated prevalence (prevalence of perforation of appendix 17.78%)10, d=margin of error =0.05 (5%). Substituting the values into the formula n=226.32. In this study, authors took 200 samples.

Inclusion criteria

Patients of all ages and both sexes who treated operatively for acute appendicitis are included in this study. Patients willingly give informed consent to take part in this study.

Exclusion criteria

Patients treated conservatively are excluded in this study. All patients who had identified normal appendix with the help of histopathological and operative findings.

Patient/attendant unwilling to give informed consent to take part in this study.

Ethical measures

When patient meet the criteria of inclusion, before enrolment in the study, the aims and objectives of the study along with its procedure and benefits or drawbacks was explained to the guardian in details in an understandable way. In case of any query, they answered appropriately. When the guardian satisfied, then an informed consent was obtained from the guardian and the patients. They had the freedom to withdraw from the study at any time.

Data collection procedure

After arrival of a patient of acute appendicitis in the General Surgery Department of Faridpur Medical College Hospital had seen by the indoor medical officer and study physician had informed. The study physician immediately seen the patient and examine thoroughly. After fulfilling the inclusion and exclusion criteria, patients were enrolled with unique ID. Subjects briefed about the objectives of the study, risk and benefits, freedom for participating in the study and confidentiality. Informed consent was obtained accordingly. The pre-structured case record form (CRF) filled up by the study physician himself.

The case definition of operational variable had been described. Patient data such as age, sex, signs and symptoms on presentation, duration of symptoms, physical findings, diagnostic modalities, surgical findings, histological diagnosis etc. were noted. This questionnaire was used for collection of information by interviewing patients. Collected all questionnaire checked very carefully to identify the error in collecting data. Data processing work were consisting of registration of schedules, editing, coding and computerization, preparation of dummy tables, analysis and matching data. The technical mater of editing, encoding and computerization looked by me.

Data analysis

Socio-demographic and clinical variables: Data for socio-demographic and clinical variables were obtained from all participants by the use of a pre-designed and easily understandable questionnaire. The socio-demographic variables studied- age, sex, place of residence and occupation. Socioeconomic levels were determined by occupation, household's income and expenditure.

After collection of all information, these data were checked, verified for consistency and edited for finalized result. After editing and coding, the coded data directly entered into the computer by using SPSS version 6. Data cleaning validation and analysis was performed using the SPSS/PC software and graph and chart by MS excel. The result was presented in tables in proportion. A "p" value <0.5 considered as significant.

RESULTS

According to the questionnaire, the history of all the 200 selected cases was taken and the clinical examination was carried out meticulously. During the hospitalized period, all appropriate investigations were done in a view to confirm the diagnosis as well as to identify risk factors for perforated appendicitis. In this series, the maximum number of patients, 65 (32.5%), were between 15-25 years age group, next 57 (28.5%) were between the age group of 26-35 years. Out of 200 cases, 73% were male and 27% were female (Figure 1). The male–female ratio was 2.7:1. On clinical examination, investigation support and pre-operative evaluation, we found that, among 200 patients, 74 (37%) had perforated appendicitis and 126 (63%) inflamed appendicitis.

The incidence of perforated appendicitis is high in male patients, 62 out of 74 (83.78%), as compared to females, 12 out of 74 (16.21%). The incidence of perforated appendicitis is higher in the extreme of ages. Before 35 years of age, it is 26 (35.13%) and in the elderly (after 35 years of age), it is 48 (64.86%). Thus, according to my study, as shown in table 1, extreme age (age>35 years) is strongly associated with perforated appendicitis. Figure 2 shows that the incidence of appendicitis is higher in the early age group (15 to 25 years), then gradually decreased with rising of age.

The distribution of patients according to their occupation category shows that the highest number of patients, 40 (20%), are from both the worker and business categories. This is followed by 36 housewives (18%), 32 service holders (16%) and 28 retired individuals (14%). The smallest group consists of farmers, with 24 patients, accounting for 12% of the total. In total, 200 patients were considered in this study, reflecting a diverse range of occupations. Patients came from both urban and rural areas with an urban (62%) preponderance.

The education level of acute appendicitis patients of primary level of education and illiterate were the most common group of patients. 58 (29%) were illiterate, 67 (33.5%) were primary level and 25 (12.5%) were secondary students (Table 2). In this series, we also evaluated and compared the frequency and spectrum of disease between perforated and non-perforated groups individually. It is observed that illiteracy 31 (41.89%) and primary level of education 27 (36.48%) with lower education status are risk factors for perforation of the appendix; it may be due to unawareness or ignorance regarding the disease.

Socioeconomically, patients are grouped into three classes. Poor class GNI per capital income (In Tk.): <7000, Middle class GNI per capital income (In Tk.): 7000-27000 and Upper class GNI per capital income (In

Tk.) >27000. Among the patients, the poor class 21 (42%) comprises the major percentage of the appendicitis patients, which is followed by middle class 19 (38%) and remaining are upper class 10 (20%) (Figure 3).

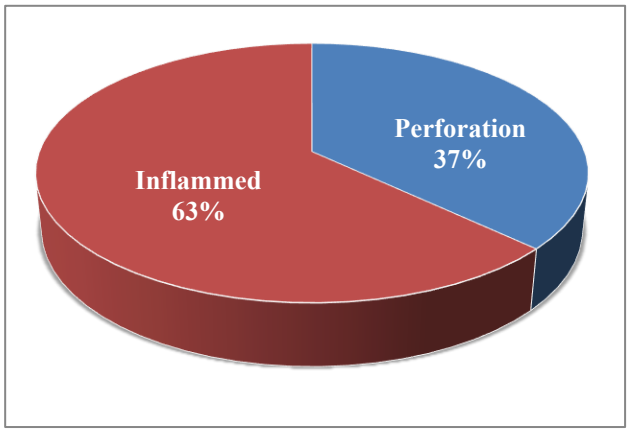

Figure 1: Types and nature of appendicitis (n=200).

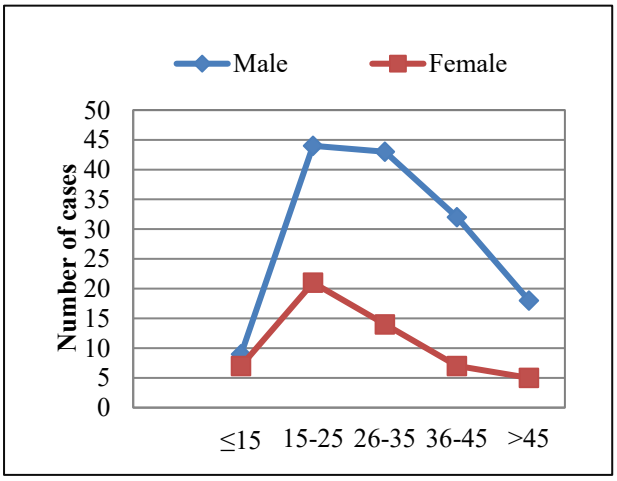

Figure 2: The frequency and incidence of disease with age variation (n=200).

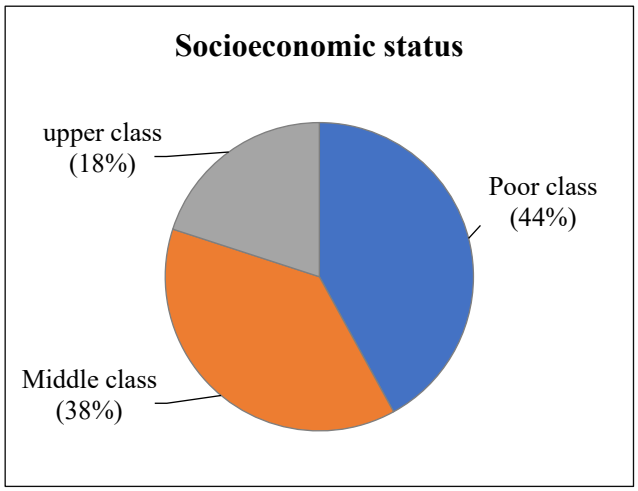

Figure 3: Socioeconomic status of the study population.

The study revealed that several predisposing factors contribute to the development of worse conditions of acute appendicitis. We found that 48 (24%) of patients were smoker, 32 (16%) previous history of acute abdomen, 27 (13.5%) were obese and 22 (11%) of cases diabetes mellitus. 3 (1.5%) patients operated for appendicitis were pregnant, but no one found having perforated appendix (Table 3).

Duration of symptoms ranged from 1 hour to a maximum of 11 days. Patients with perforated appendix who presented in the emergency ward on the first day of the onset of symptoms were only 4 (5.40%). Patients presented on day 1 to 5 were 31 (41.89%). Maximum patients with perforated appendix presented on day 6 to 9 i.e., 39 patients (52.70%). The delay in hospitalization augments the worsening of the disease process and development of complications, ultimately increasing the risk for perforation. On the other hand, patients of inflamed appendicitis are hospitalized as soon as possible after sign-symptoms development (Table 4).

The presentation of perforated appendicitis in surgical ward varied from pain right iliac fossa only to generalized peritonitis. Abdominal pain was the most common symptom, reported by all 200 patients (100%). Nausea and vomiting followed closely, affecting 147 patients (73.5%), while anorexia was reported by 129 patients (64.5%). Fever was observed in 122 patients (61%) and abdominal distension was noted in 108 patients (54%). Other symptoms included back pain in 27 patients (13.5%), respiratory discomfort in 57 patients (28.5%) and diarrhea in 33 patients (16.5%). This distribution highlights the varying intensity and range of symptoms experienced by the patients (Table 5).

The laboratory features of the patients. In terms of leukocyte count, 37 patients (18.5%) had a count of less than 10,000/mm³, 88 patients (44%) had a count between 10,000–15,000/mm³ and 75 patients (37.5%) had a count greater than 15,000/mm³. Regarding neutrophil count, 32 patients (16%) had a count of less than 75%, while the majority, 168 patients (84%), had a neutrophil count greater than 75%. Finally, the erythrocyte sedimentation rate (ESR) was elevated in 158 patients (79%) and normal in 42 patients (21%). These laboratory findings provide important insights into the immune response and inflammation levels in the patient population.

Table 6 shows laparotomy findings and macroscopic characteristics of tissue. There were 126 (63%) inflamed appendicitis, 74 (37%) were acute appendicitis with perforation. Generalized peritonitis due to purulent peritoneal collection was observed in 98 (49%) of cases. On gross examination, we found 72.5% cases obstruction of lumen due to fecolith, 11% due to worm impaction in the lumen and 16.5% of cases no obstruction. Thus, obstructive appendicitis due to faecolith is strongly associated with perforated appendicitis.

The age of participants at entry was 15 to 45 years and the mean age was 24.3±3. Participants were randomly selected as male or female. The Sex ratio (M: F) was 2.7:1. The median self-reported duration of questionnaire completion was 70 minutes (range 50–90). Baseline clinical characteristics are: Interval symptoms onset-operation time in hour (Mean±SD) were 96.57±32.64, major risk factors White blood cell (mm3) (mean±SD) was 15380±6826, lower socioeconomic status and lower level of education (Table 7).

Table 1: Age and sex distribution of the patients (n=200).

Age (in years)	Perforated appendicitis (n=74)		Inflamed appendicitis (n=126)	
	Male	Female	Male	Female
<15	0	1	9	6
15-25	8	3	36	18
26-35	14	0	29	14
36-45	23	5	9	2
>45	17	3	1	2
Total	62	12	84	42

Table 2: Distribution of respondents by educational level (n=200).

Educational level	Perforated appendicitis (n=74)	Inflamed appendicitis (n=126)	Total
Illiterate	31	27	58
Primary	27	40	67
Secondary	6	19	25
Higher secondary	9	23	32
Graduate	0	13	13
Above graduate	1	4	5

Table 3: Association of predisposing condition/ co-morbid condition.

Predisposing factors	Number of patients	%
Smoking	48	24
Pregnancy	3	1.5
Previous H/O acute abdomen	32	16
Obesity	27	13.5
Diabetes mellitus	22	11

Table 4: Time interval between symptom onset and hospitalization (n=200).

Duration	Perforated appendicitis (n=74)	Inflamed appendicitis (n=126)	Total (%)
1-6 hour	1	16	17 (8.5)
7-24 hour	4	45	49 (24.5)
1-5 days	31	47	78 (39)
6-9 days	39	14	53 (26.5)
>9 days	0	3	3 (1.5)

Table 5: Distribution of the patients according to physical signs.

Physical sign	Number of patients	%
Tenderness in right lower quadrant	50	100
Rebound tenderness	47	94
Elevated temperature	47	94
Rovsings sign	38	76
Positive cough sign	43	86
Generalized peritonitis	53	26.5
Palpable abdominal mass	17	34

Table 6: Laparotomy findings and macroscopic features of tissue (n=200).

Findings	Number of patients	%
Inflamed appendicitis	126	63
Suppuration with perforation	74	37
Generalized peritonitis	98	49
Fecolith in lumen	145	72.5
Worm in lumen	22	11
Empty lumen	33	16.5
Adhesion to surrounding structure	117	58.5

Table 7: Baseline characteristics/ risk factors associated with appendix perforation (n=200).

Variables	Result
Age in years (Mean±SD)	24.3±3
Sex ratio (M:F)	2.7:1
Interval symptoms onset-operation time in hour (Mean ± SD)	96.57±32.64
White blood cell (mm^3) (mean±SD)	15380±6826
Socioeconomic status	Lower class
Occupational status	Worker
Education status	Illiterate & primary class

DISCUSSION

The current study aimed to investigate the risk factors for appendix perforation. The most critical element is the patients' late presentation following the development of symptoms.[10] The longer the interval between symptoms and treatment, the greater the likelihood of problems. Age is also considered a significant risk factor for appendix perforation. Ages less than ten and over forty are connected with high mortality and morbidity. Perforated appendices occur in 20% of children under the age of l0 years. The incidence of acute appendicitis is lower in the elderly than in the younger age group.[11]

In the present study, of the 200 patients enrolled for the study, the maximum number of patients 65 (32.5%) were between 15-25 years age group, next 57 (28.5%) were between the age group of 26-35 years. The mean age of appendicitis was 24.3±3 years. The overall incidence of disease increases during the younger period, teenage and then gradually decreases, but rate and incidence of perforated appendicitis observed mainly in elder patients. The incidence of perforated appendicitis is high in male patients, 62 out of 74 (83.78%), as compared to females, 12 out of 74 (16.21%). The incidence of perforated appendicitis is higher in the extreme of ages. Before 35 years of age, it is 26 (35.13%) and in the elderly (after 35 years of age) it is 48 (64.86%). According to this study, extreme age (age>35 years) is strongly associated with perforated appendicitis.

Findings are consistent with the several national and international study. In a descriptive study, conducted in the surgical unit Madina teaching hospital revealed that incidence of perforated appendicitis is higher in males (69.17%) as compared to females (30.82%).[11] Perforated appendix was found in 133 patients (20.74%). The incidence of perforated appendicitis is high in males (69.17%) and in the extreme of ages. Gurleyik et al described that morbidity and mortality rates in elder patients with perforated appendicitis are comparatively higher than the other age groups and are 35.5% and 5.5%, respectively.[12]

Another retrospective study among 214 patients of acute appendicitis over the age of 60 years showed that acute appendicitis is the most common surgical emergency and becomes serious when it perforates.[4] Perforation is more frequent in elderly patients. The appendix was found perforated in 87 (41%) patients, 46 (53%) males and 41 (47%) females.[4] Appendicitis is most common between the ages of 10 and 20 years, but no age is exempt. A male preponderance exists, with a male-to-female ratio of 1.4:1, the overall lifetime risk is 8.6% for males and 6.7% for females in the United States. Since the 1940s, the incidence of hospital admission for acute appendicitis has been falling, but the reason for this decline is not clear.[2] In this study, the majority of the patients comprised of businessmen (20%), workers (20%) and housewives (18%). Patients came from both urban and rural areas with an urban (62%) preponderance. The education level of acute appendicitis patients of primary level of education and illiterate were the most common group of patients. 58 (29%) were illiterate, 67 (33.5%) were primary level and 25 (12.5%) were secondary students.

In this series, we also evaluate and compare the frequency and spectrum of disease between perforated and non-perforated groups individually. It is observed that illiteracy 31 (41.89%) and primary level of education

27 (36.48%) with lower education status are risk factors for perforation of the appendix, it may be due to unawareness or ignorance regarding the disease. Socioeconomically, patients are grouped into three classes. Poor class GNI per capital income (In Tk.): <7000, Middle class GNI per capital income (In Tk.): 7000-27000 and Upper class GNI per capital income (In Tk.): >27000. Among the patients, the poor class 21(42%) comprises the major percentage of the appendicitis patients, which is followed by middle class 19 (38%) and upper class 10 (20%).

On clinical examination, investigation support and pre-operative evaluation, we found that, among 200 patients, 74 (37%) had perforated appendicitis and 126 (63%) inflamed appendicitis. The study revealed that several predisposing factors contribute to the development of worse conditions of acute appendicitis. We found that 48 (24%) of patients were smoker, 32 (16%) previous history of acute abdomen, 27 (13.5%) were obese and 22 (11%) of cases diabetes mellitus. 3 (1.5%) patients operated for appendicitis were pregnant, but no one found having perforated appendix. A study in Dicle University Hospital, Diyarbakir, Turkey, by Yilmaz, among fifty-two pregnant women who were diagnosed and operated upon acute appendicitis in reported that frequency of appendicitis was higher in second trimester.[12]

Omari et al, demonstrated that, in their study, 31% were diagnosed by clinical assessment alone, 40% needed US and 29% needed a CT scan. Of all the risk factors studied, the patient's pre-hospital time delay was the most important risk factor for perforation. The perforation rate was not dependent on the presence of comorbid diseases or in-hospital time delay.[4] In this study, the duration of symptoms ranged from 1 hour to a maximum 11 days. Patients with perforated appendix who presented in the emergency ward on the first day of the onset of symptoms were only 4 (5.40%). Patients presented on day 1 to 5 were 31 (41.89%).

Maximum patients with perforated appendix presented on day 6 to 9 i.e., 39 patients (52.70%). The delay in hospitalization augments the worsening of the disease process and development of complications, ultimately creating a risk for perforation. On the other hand, patients of inflamed appendicitis are hospitalized as soon as possible after sign-symptoms development. In a study reported maximum patients with perforated appendix presented on day 5 i.e., 44 patients (30.30%). The delay in presentation ranges from four days to about thirteen days. The mean delay from the onset of symptoms to surgery is 4.2 days.[14]

Patients with acute appendicitis typically present with abdominal pain as their predominant symptom. Murphy first characterized the diagnostic sequence of colicky central abdominal pain followed by vomiting and pain migration to the right iliac fossa, which may only be present in 50% of patients.[15] A meta-analysis of the symptoms and signs associated with acute appendicitis did not uncover a single diagnostic finding, but it did demonstrate that pain migration was related with a diagnosis of acute appendicitis.[16] The manifestation of perforated appendicitis in the surgical ward ranged from pain in the right iliac fossa to widespread peritonitis. Abdominal pain was 200 (100%), followed by nausea, vomiting 147 (73.5%), fever 122 (61%) and anorexia 129 (64.5%). Tenderness in the right lower quadrant was the most common physical sign of appendicitis pathology, present in 100% of cases, followed by rebound tenderness and elevated temperature, 94%, respectively.

Generalized peritonitis (26.5%) and palpable abdominal mass were 17 (34%) cases. A descriptive study revealed that most of the patients (60.90%) were admitted to the ward with complaints of pain in the right iliac fossa with fever.[17] 25 patients (18.79%) presented with pain only without fever. Faecolith was found preoperatively in 58 out of 133 patients. Obstructive appendicitis due to faecolith is strongly associated with perforated appendicitis ($p<0.001$ chi-squared test). The patients with diabetes have more incidence of perforation of the appendix. Diabetes is an important risk factor for the patients presenting in the surgical emergency ward with perforated appendicitis. The incidence of perforation of the appendix is higher in patients who are taking steroid therapy.[17]

The patient is frequently hot, with a dry tongue and a fetor oris. Pyrexia (up to 38°C) is frequently associated with tachycardia. Following pain localization to the right iliac fossa, abdominal examination reveals regional tenderness and muscular rigidity. Tenderness on rectal examination may suggest appendicitis, but it is not a diagnosis.[15] Percussion discomfort, guarding and rebound tenderness are the most accurate clinical indicators of acute appendicitis.[15] Additional examination procedures that may aid in the diagnosis of appendicitis include Rovsig's sign (palpation of the left iliac fossa induces pain in the right iliac fossa), the psoas stretch sign and the obturator sign.[2] Sandy Craig reported that the most common symptom of appendicitis is abdominal pain.[18]

Typically, symptoms begin as periumbilical or epigastric pain migrating to the right lower quadrant (RLQ) of the abdomen. This pain migration is the most discriminating feature of the patient's history, with a sensitivity and specificity of approximately 80%, a positive likelihood ratio of 3.18 and a negative likelihood ratio of 0.5. The duration of symptoms is less than 48 hours in approximately 80% of adults but tends to be longer in elderly persons and in those with perforation. Approximately 2% of patients report a duration of pain in excess of 2 weeks. A history of similar pain is reported in as many as 23% of cases, but this history of similar pain, in and of itself, should not be used to rule out the possibility of appendicitis.[18]

A study in Dicle University Hospital, Diyarbakir, Turkey, by Yilmaz, reported that the interval between symptom onset and operation was found as the only predictive variable, which was independently associated with the presence of appendiceal perforation.[13] There was a significant difference between perforated and non-perforated patients regarding the rate of complications (52% vs. 17%). The most common symptoms on presentation were right lower quadrant pain (69%) and nausea and vomiting (58%). Mean white blood cell count (WBC) was 13784±5506/mm^3. Abdominal ultrasounds revealed a non-compressible tubular structure in the right lower quadrant consistent with acute appendicitis in 10 patients. The sensitivity of ultrasound was 48% and the specificity was 100%. Its positive predictive value was 100% and its negative predictive value was 8%. The rate of accuracy was 50%. In this series, abnormal leukocyte count, differential counts and ESR are usually present at diagnosis, reflecting the degree of disease.

The presenting leukocyte counts range widely, from 0.1 to 1500×109/l (median 15×109/l) and are increased (>10×109/l) in slightly over one-half of the patients. The degree of leukocyte count elevation at diagnosis is a very strong predictor for the complication of disease and prognosis. Increased ESR is usually present in an inflammatory condition, present in 79% of cases. The table shows laparotomy findings and macroscopic characteristics of tissue. There were 126 (63%) inflamed appendicitis, 74 (37%) were acute appendicitis with perforation. Generalized peritonitis due to purulent peritoneal collection was observed in 98 (49%) of cases. On gross examination, we found 72.5% cases obstruction of lumen due to fecolith, 11% due to worm impaction in the lumen and 16.5% of cases no obstruction. Thus, obstructive appendicitis due to faecolith is strongly associated with perforated appendicitis.

This study had several limitations. First, the sample size was small, which may affect the generalizability of the findings. Additionally, it was a single-center study conducted FMCH, meaning the results may not represent the broader population of the country. A larger, multi-center study would be needed to provide more definitive conclusions. The study was also conducted in a tertiary care hospital, which may not reflect practices or patient populations seen in primary or secondary healthcare centers. Furthermore, there was no uniform management protocol followed across all units of the hospital, potentially leading to inconsistencies in treatment. Finally, the purposive sampling method used could introduce personal bias, which may have influenced the results.

CONCLUSION

Perforated appendicitis is associated with high morbidity and mortality rates, especially in elders, diabetics and immunocompromised patients. We should be aggressive in the treatment of appendicitis in high-risk patients. So, once acute appendicitis is diagnosed, the expedient surgery and appropriate use of perioperative antibiotics can help to minimize the morbidity and mortality. The present study suggests some risk factors contribute to worsening of appendicitis, however, diagnosis of appendicitis remains essentially still-clinical. Its level comes out to be a credible aid in the diagnosis of acute appendicitis and would be a helpful investigation in decision making.

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