

A Study of Factors Responsible for Delayed Presentation of Acute Appendicitis and their Implications on the Outcome

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ABSTRACT

Objectives: To highlight different etiological factors and their implications on outcome of delayed presentation of acute appendicitis.

Study Setting: This study was carried out at the North Surgical Unit, Mayo Hospital Lahore from January 2004 to December 2006.

Study design: All patients of delayed presentation of acute appendicitis were sampled through convenient sampling.

Data analysis: As it was a cross sectional descriptive case study so no statistical test was applied. Collected data will be analysed by comparing it to available local and international data.

Results: Female gender in second to third decade of life residing distantly with low socio-economic status and presenting late after first symptom along with illiteracy, transportation hurdles, holidays unfamiliarity with the medical facilities, social taboos and misdiagnoses were the contributing factors for delay in presentation. Co-morbidity, leucocytosis, unusual position of appendix and primarily closed wounds in complicated appendix caused increased rate of complications in such cases. Delayed presentation not only caused increased complicated appendix seen at exploration but also contributed to the increased rate in delayed recovery resulting in longer hospital stay and increased rate of local and systemic complications observed at follow-up.

Conclusion: Female gender in second and third decade of life residing distantly from the medical facility with low socio-economic status and presenting late after the first symptom of disease are important factors in delayed presentation of acute appendicitis.

Key Words: Delayed Presentation, Appendicitis, Factors, Complication

INTRODUCTION

Acute abdomen is the most common cause with which the patient presents in the surgical emergency room. Among these the most commonly diagnosed surgical diseases requiring operation is acute appendicitis¹.

Acute appendicitis is the most common abdominal surgical emergency which the general surgeons have been dealing with for the last hundred years².

The reported life time prevalence as high as one in seven³. The number of medical emergencies in developed countries has increased considerably and acute abdominal pain appears to be one of the most frequent presentation. Nearly 75% of these cases can be attributed either to non specific abdominal pain or appendicitis⁴. Acute appendicitis is a common surgical emergency in the urban setting of a

developing country⁵. According to an estimate, 6% of population will suffer from acute appendicitis during their life time².

The appendix alone is responsible for 10% of all emergency abdominal surgery³⁻⁶. Appendicitis is principally the disease of young and middle aged. The peak age group is 11 to 30 years in both sexes⁷. After the age of 50 years, the incidence of this disease is only 1:35 for women and 1:50 for men.

MATERIALS & METHODS

Study Setting:

1. This study was carried out at the North Surgical Unit, Mayo Hospital Lahore from January 2004 to December 2006.
2. This study incorporates hundred patients admitted through accident and emergency department.
3. It is a descriptive analysis of patients admitted in the North Surgical ward presented with delayed presentation of acute appendicitis.

Study design: All patients of delayed presentation of acute appendicitis were sampled through convenient sampling.

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Received September 2007; accepted November 2007

Data analysis: As it was a cross sectional descriptive case study so no statistical test was applied. Collected data will be analysed by comparing it to available local and international data.

Inclusion criteria: All patients were adults (more than 12 years of age) of both genders. All patients had normal weight for average height and were in good general health.

Exclusion criteria: Exclusion criteria included patients below 12 years of age of both genders, malnourished and those with a clinically palpable appendicular mass.

RESULTS

A total of 100 patients were admitted to the North Surgical Ward, Mayo Hospital Lahore through accident and emergency department from December 2002 to August 2004 with delayed presentation of acute appendicitis who under went emergency appendectomy.

The hundred admitted patients revealed the gender ratio of 34% males and 66% females.

According to the residential address the patients were divided into two groups. Group one were the patients living within the radius 5 km of the hospital; they were 24 in number and 18 were male and 6 were female, while group two that was residing outside 5 km radius of the hospital comprised 76 out of whom 16 were male and 60 were female.

Socio-economic status distribution of the patients showed 46 patients were from the poor class (16 males and 30 females); 28 patients were from lower middle class (10 males and 18 females); 16 patients from middle class (6 males and 10 females), while 10 patients were from affluent class (2 males patients and 8 females).

The distribution of patients according to the time since the appearance of symptoms included in the study was as follows:

Category 1: presenting within 24-30 hours of appearance of symptoms among whom 24 were males and 28 were females with a total of 52.

Category 2: presenting within 30-40 hours of appearance of symptoms among whom 4 were males and 26 were females with a total of 30.

Category 3: presenting within 40-48 hours of appearance of symptoms among whom 4 were male and 14 were females with a total of 18.

The cause of delay in presentation were as follows:

Transportation hindrances: 18 patients out of whom 8 were male and 10 females.

Vacations and public holidays perturbed 24 patients out of whom 6 were males and 18 females. Ignorance of availability of medical facilities affected

20 patients among whom 10 were male and 10 females. Misdiagnoses were the cause of delay among 14 patients (out of which 4 male and 10 females).

The other causes of delay affected only 2 patients of whom 1 was female and the other was a male. Signs of acute appendicitis among the patients were as follows: Tachycardia was present in 98% of patients, pyrexia was present in 84% of patients, and tenderness was present in right iliac fossa was present in all the 100 patients. Rebound tenderness in right iliac fossa was present in 98% of patients, muscular guarding was present in 96% of patients; while 74% of patients had other signs of acute appendicitis like Obturator, Rovsing, and Cough sign.

Co-morbidity affected 22% of my patients amongst whom, 8 suffered from pulmonary tuberculosis (4 males and 4 females) and 6 patients had hyper tension (of these 2 were males and 4 were females) while diabetes was present in 8 patients among whom 2 were male and 6 were females. All patients having comorbidity were above the age of 35 years. 78% patients in this study had no comorbidity (amongst whom 26 were males and 52 were females). The investigation results from the patients included in this study showed normal TLC in 52% patients amongst whom 40 were of category 1 while 6 were from category 2 and 6 were from category 3. Increased TLC was present in 48% of patients amongst whom 12 belong to category 1 and 24 to category 2 while 12 are allied to category 3.

The status of appendix at the time of surgery amongst our study patients exhibited acutely inflamed appendix in 30 patients (26 from category 1 and 4 from category 2); while gangrenous appendix was present in 32 patients (16 from category 1, 12 from category 2 and 4 from category 3). Perforated appendix with pus in the right iliac fossa was present in 24 patients (8 from category 1, 10 from category 2 and 6 from category 3); while early appendicular mass was present in 14 patients (2 were from category 1, 4 from category 2 and 8 from category 3).

Retrocecal appendix was present in 80 patients (42 from category 1, 25 from category 2 and 13 from category 3); while preileal appendix was present in 6 patients (4 from category 1 and 2 from category 2). Post ileal appendix was present in 6 patients (among whom 4 from category 1 and 2 from category 3); while pelvic appendix was present in 8 patients (among whom 2 are from category 1 and 3 each from category 2 and 3).

The lab results before the surgery among our study patients showed increased TLC count in 46 patients, 12 in category 1, 22 in category 2 and 12 in category 3 (Table 1).

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Table 1: Lab results

TLC Count	Category			Category 2			Category 3			Grand total
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Normal	20	20	40	2	6	8	2	4	6	54
Increased TLC	4	8	12	2	20	22	2	10	12	46

Table 2: Status of Appendix at Surgery

TLC Count	Category			Category 2			Category 3			Grand total
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Acutely Inflamed	16	10	26	0	4	4	0	0	0	30
Gangrenous appendix	6	10	16	2	10	12	0	4	4	32
Perforated appendix	2	6	8	2	8	10	2	4	6	24
Early appendicular mass	0	2	2	0	4	4	2	6	8	14

Table 3: Method of closure

Type of Closure	Acutely Inflamed	Gangrenous	Perforated	Early Mass	Total
Primary	30	12	0	0	42
Delayed primary	0	20	24	14	58
Total	30	32	24	14	100

In our study 42 patients under went primary closure of the wound (36 from the acutely inflamed appendix and 12 having gangrenous appendix); while 68 patients under went delayed primary closure (20 with gangrenous appendix, 24 with perforated appendix and 14 with early appendicular mass) (Table 3).

Nil per orum in the post-operative period among our study patients varied from 1-3 days. 42 patients were kept NPO from one day (all acutely inflamed appendix patients + 12 gangrenous appendix patients); while 2 day NPO was done in the rest of 20 gangrenous patients. 3 day NPO post operatively was done in 38 patients having perforated appendix or with early appendicular mass formation

Postoperatively the wound condition showed only 10 wounds; which were infected and all were from gangrenous appendix patients whose wounds were primarily closed.

Post-operative stay at the hospital varied 2-7 days. 2 days stay for primarily closed wounds in all acutely inflamed and 12 gangrenous appendix patients with a total of 42 patients. 7 days stay was observed in 68 patients having delayed primary closure was done at 5th post operative day (all perforated appendices and early mass formation patients and also 20 patients with gangrenous appendix)

The follow up of our study patients showed that 7 patients (3 with off and on pain and 4 with subacute intestinal obstruction) had problem in the first month of follow up. 3 months follow up showed 3 patients presenting with problem (1 patient with off and on pain and 2 patients with subacute intestinal

obstruction). At 6 months of follow up no patient had any morbidity. All patients who presented with problems during the follow up period were managed conservatively and the recovery was uneventful.

DISCUSSION

Acute appendicitis is the most common surgical emergency and its incidence is increasing in the developing countries while it is on decline in the western hemi-sphere. No age is exempt from it. The diagnosis of this surgical problem is primarily clinical presentation of acute appendicitis later than 24 hours is associated with high complication rates. The delayed presentation of acute appendicitis is not unusual in a developing country like Pakistan.

The results of our study show that the delayed presentation of acute appendicitis is more in females i.e., 34 males verses 66 females. It is in accordance with the social influence of male dominance in our society. Males usually present earlier and their number in this study is less due to decreased number of patients presenting late. The females are usually a neglected part of our society so their health concerns are not seriously taken.

The residential status has also an important bearing in the delayed presentation and complication⁸. In our study the patients residing outside 5 km radius of the hospital (76%) are 3 times more common than the residents in the 5km radius (24%). This result highlights the importance of availability of medical facilities near the home for better utilization.

The socioeconomic status of the patients is also an important factor in the delayed presentation of

acute appendicitis⁵. In our study incidence of poor and lower middle class (74%) is about 3 times more in lately presenting than the middle and the affluent class (26%). This result highlights the importance of socio-economic status for early and better utilization of available medical facilities.

Acute appendicitis is a common surgical problem and the awareness of complications associated with its delayed presentation makes the people to come earlier. 52% patients presented in 24 to 30 hours of initiation of pain (group 1). Only 18% patients presented much later that is 40 to 48 hours after the first symptom (group 3). This result shows that the people are usually aware of more deadly complications associated with acute appendicitis and they tried to present as earlier as possible. So the community awareness plays an important role in decreasing the rate of complications associated with any disease.

Delayed presentation is more common among the illiterates (54%)⁹. In our study 64% patient were illiterate. This highlights the importance of literacy level; which is an important factor in the utilization of available medical facilities effectively.

One of the reasons to accentuate this study is to emphasize the cause of delay in presentation among the patients of acute appendicitis. Social taboos, lack of knowledge of available medical facilities (50%) are the major factors for delay in presentation⁹. In our study these were the major factor in (66%) patients while misdiagnoses (14%) especially among females (10 out of 14) is also an important contributing factor. These results are in consistence with the socio-economic and cultural atmosphere of a developing country and highlight the importance of literacy level, awareness of available facilities and social and cultural values and their effect on the outcome of a disease. Misdiagnoses among females presenting with signs and symptoms of acute appendicitis is also a proven factor in the medical literature. Better communication facilities are the mainstay for better utilization of available resources.

The result of our study show that majority (78%) of patients had no co-morbidity as the highest number of our patients were quite young. The co-morbidity was present in only minority (22%) of patients (all of whom were above the age of 35 years). The co-morbidity such as diabetes and hypertension is more common in the elderly while tuberculosis is rampant in all ages in this part of the world.

Laboratory results especially leucocytoses is considered to be an important contributing factor in the diagnosis of acute appendicitis¹⁰. Our study shows that about half (46%) patients had leucocytosis while the other half (54%) had normal

TLC. This high percentage of increased TLC count is due to delayed presentation among the acute appendicitis patients.

The rate of complication increases with the adjournment in presentation and management of acute appendicitis (40%). The complication of delayed presentation are gangrenous appendix (25%) and appendicular mass (35%)⁸. Our study results show that only one third (30%) of the appendices were acutely inflamed at the time of exploration and majority of them (26 /30) belong to the group 1 of time duration. Gangrenous appendices were present in another one third (32%) of patients while perforated appendix and early appendicular mass was present in the rest (38%). These results shows that as the time duration increases from the initiation of the symptoms to the presentation and management, the complication rate increases and acutely inflamed appendicitis gradually converts to more lethal forms.

The position of appendix at the time of exploration in this study show that majority (80%) of appendices were of the retrocaecal type. Other types were also present (20%) which shows that the complication rate also is more common in unusual types of appendices¹¹.

The incidence of wound infection can be reduced with delayed primary closure³⁸. Primary closure of the wound is the routine for patients presenting with acute appendicitis but in our study delayed primary closure was done in majority of patients (58%) and primary closure was done in some patients (42%). Primary closure was done in all the patients with acutely inflamed appendix (30) and some of the patients with gangrenous appendix (12). The delayed primary closure was done at 5th post operative day in all patients with perforated appendix and early appendicular mass (38) and some of the gangrenous appendix patients (20).

Washing of the peritoneal wound with normal saline and mopping it dry in all the patients with gangrenous and perforated appendix and also with early appendicular mass (70%). No normal saline washing mopping was done in acutely inflamed appendicitis.

Corrugated rubber drain is not routinely placed in patients with acute appendicitis. In our study majority of patients did not have corrugated rubber drain in their wound (76%). Only a few patients (24%) with perforated appendix and pus in the right iliac fossa had corrugated rubber drain in their wound.

Wound infection is a common complication in patients with appendicectomy. In our study only ten wounds were infected which were primarily closed and had gangrenous appendix on exploration. All other primarily closed and all the delayed primary

closure wounds remained uninfected. This result shows that all the wounds with complicated appendix at the time of exploration should be kept open and delayed primary closure is the best approach to keep these wounds uninfected so as to expedite early recovery and discharge of the patient¹².

More is the delay, longer the stay⁶. Stay at the hospital after routine appendectomy in a patient with acute appendicitis is not more than a day but in our study the delayed presentation made the hospital stay a bit longer. Two days stay was observed in few patients with primarily closed wounds (42%) that is the patients with acutely inflamed appendix and some patients with gangrenous appendix. Two to seven days stay was practiced for all patients with delayed primary wound closure as after 72 hours the clean wound in these patients were closed under local anesthesia. The stay in hospital was more due to longer NPO status of the patients and to close the wounds before discharging the patients.

The incidence of post appendectomy, sub-acute intestinal obstruction (2%) and vague abdominal pain (5%) is seen in first few months¹³. The follow-up during our study was one, three, and six months outdoor check-up. These results show highest incidence of complication rate at the first follow-up i.e. first month. 4 patients with sub acute intestinal obstruction and 3 patients with off and on pain whole abdomen were admitted to the ward and managed conservatively. Their recovery was uneventful. Follow-up at three months interval show 2 patients with sub acute intestinal obstruction and 1 patient with whole abdominal pain off and on. These 3 patients were admitted in the ward and managed conservatively with an uneventful recovery.

CONCLUSION

Female gender in second and third decade of life residing distantly from the medical facility with low socio-economic status and presenting late after the first symptom of disease are important factors in delayed presentation of acute appendicitis.

Illiteracy, transportation hurdles, holidays, ignorance of available medical facilities, social taboos, and misdiagnoses are other contributing factors. Co-morbidity, leucocytosis, unusual position of appendicitis and primarily closed wounds in complicated appendix are also important factors in

increasing the rate of complications in lately presented cases of acute appendicitis.

Delayed presentation of acute appendicitis not only caused increased rate of complicated appendix seen at exploration but also contributed to the increase in delayed recovery resulting in extensive hospital stay with increased rate of local and systemic complications.

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