

Diagnostic Value Of Bedside Evaluation In Patients Of Perforated Appendicitis

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Abstract

Background

Acute appendicitis is one of the most common surgical condition which has to be treated on emergency basis worldwide. The perforated appendicitis and uncomplicated appendicitis are having almost same presentation, the signs and symptoms overlap so differentiating between the two is very important and is the topic of debate. Current study aimed to find out the differentiating signs and symptoms between uncomplicated appendicitis and the complicated appendicitis preoperatively.

Methods:

A case control study was conducted at the surgical department of Sir Syed College of Medical Sciences for Girls during the period of July to December 2021. After getting permission from the hospital the medical record of all those patients who under went open or laparoscopic appendectomy were collected. Study participants were divided into two groups; Group-I was having simply inflamed appendix while the Group-II including perforated appendicitis. Data was analyzed by using Statistical Package for Social Science version-20. p-value less than 0.05 was considered as statistically significant.

Results:

The mean age of the study participants in simple appendicitis was 22.8±8.7 years while in perforated appendicitis, it was 26.3±7.6 years. Total leukocyte count was higher in perforated appendicitis than the uncomplicated one. Few signs and symptoms showed strong significant association with inflammation and perforation of appendix, including diarrhea, generalized abdominal pain, right lumbar quadrant pain, anorexia, guarding in right iliac region and a palpable mass in right iliac fossa. Other symptoms like nausea, vomiting, upper abdominal pain, mid abdominal pain, lower abdominal pain, right lumbar quadrant pain, rebound tenderness, radiation, dysuria, malaise and fever, have found no any significant association.

Conclusion:

It can be concluded that the traditional bedside evaluation is a very good approach for diagnosing perforated appendicitis, specially focusing the parameters like diarrhea, generalized abdominal pain, right lumbar quadrant pain, anorexia, guarding in right iliac region and a palpable mass in right iliac fossa.

Introduction

Acute appendicitis is one of the most common surgical condition which has to be treated on emergency basis worldwide. The treatment of choice is the open or laparoscopic appendectomy but the recently published guidelines are suggestive of antibiotic coverage in uncomplicated cases of appendicitis which is an effective option and also reduces the morbidity. The complicated cases like perforated appendicitis or developing gangrene in inflamed appendix, surgery is the best option(1, 2). Because of difference in treatment choice, it is very important to early differentiate uncomplicated appendicitis from the perforated appendicitis (3) and multiple studies have been done on this point so that the complications due to perforated appendicitis like peritonitis and abscess formation, can be prevented (4).

The perforated appendicitis and uncomplicated appendicitis are having almost same presentation, the signs and symptoms overlap so differentiating between the two is very important and is the topic of debate (5). Literature revealed that there are few parameters which are suggestive of perforated appendicitis like elder age group, prolong persistent symptoms, tender right iliac region, increased white blood cell (WBC) count, increased C-reactive protein, increased erythrocyte sedimentation rate (ESR), and increased bilirubin levels. These predictors of perforated appendicitis are the basis of treatment protocols including conservative or surgical management (6-9).

Despite of these all predictors of perforated appendicitis, it is still a dilemma to differentiate between simple and perforated appendicitis before surgery because symptoms overlap in both cases. So the bedside evaluation of patient by taking a detailed history and physical examination along with lab investigation can be helpful in differentiating the two conditions. It may also helpful in decision making regarding the type of incision including Girdiron incision and Lanz incision and also the type of surgery like open appendectomy and laparoscopic appendectomy (10, 11). Current study aimed to find out the differentiating signs and symptoms between uncomplicated appendicitis and the complicated appendicitis preoperatively.

Material and Methods

A case control study was conducted at the surgical department of Sir Syed College of Medical Sciences for Girls during the period of July to December 2021. Study got ethical approval from the concerned institute. Sample size was calculated by using OpenEpi calculator and was 160. After getting permission from the hospital the medical record of all those patients who under went open or laparoscopic appendectomy were collected. Study participants were divided into two groups; Group-I was having simply inflamed appendix while the Group-II including perforated appendicitis. Each group was having 60 participants. Demographic data, history, clinical examination and pre-operative notes were written in patients record file.

Data was analyzed by using Statistical Package for Social Science (SPSS) version-20. Numerical variables were analyzed as mean and standard deviation while for categorical variables frequency and percentages were calculated. Student t-test was applied for calculating association between the numerical variables of two groups while Chi-square was used to find out the association between signs and symptoms of both groups. p-value less than 0.05 was considered as statistically significant.

Results

Study participants were divided into two groups including those who have just inflamed appendix while other group was having perforated appendicitis. Majority study participants were male (59%) in comparison to female ones. The mean age of the study participants in simple appendicitis was 22.8 ± 8.7 years while in perforated appendicitis, it was 26.3 ± 7.6 years and there was no association between age and complication of appendicitis. Duration of onset of pain in simple appendicitis was 59.9 ± 62.1 hours and 92.0 ± 75.4 hours in perforated appendicitis with significant association. The time taken by the physician to assess the condition of uncomplicated and complicated appendicitis

was 2.5 ± 5.8 hours and 4.9 ± 7.2 hours respectively and has no significant association. Total leukocyte count was higher in perforated appendicitis than the uncomplicated one and it has a strong significant association with the onset of complicated appendicitis as mentioned in Table 1.

Table 1 Characteristic feature of study participants

		Uncomplicated appendicitis	Perforated appendicitis	p-value
Age (years)	Male	26.2 ± 5.4	29.5 ± 7.3	0.76
	Female	20.8 ± 9.2	23.9 ± 6.1	
Pre-hospital onset of pain (Hours)		59.9 ± 62.1	92.0 ± 75.4	0.02
Assessment time taken (Hours)		2.5 ± 5.8	4.9 ± 7.2	0.85
Total leukocyte count		9.9 ± 4.1	14.2 ± 5.8	0.00

The most common symptoms in perforated appendicitis were rebound tenderness, guarding in right iliac region and anorexia. A total of 19 parameters were evaluated for differentiating the uncomplicated appendicitis and perforated appendicitis, out of which few signs and symptoms showed strong significant association with inflammation and perforation of appendix, including diarrhea, generalized abdominal pain, right lumbar quadrant pain, anorexia, guarding in right iliac region and a palpable mass in right iliac fossa with p-value of 0.002, 0.000, 0.032, 0.029, 0.012 and 0.000 respectively. Other symptoms like nausea, vomiting, upper abdominal pain, mid abdominal pain, lower abdominal pain, right lumbar quadrant pain, rebound tenderness, radiation, dysuria, malaise and fever, have found no any significant association, as p-value was more than 0.05 as mentioned in Table 2.

Table 2 Frequency of symptoms in uncomplicated and perforated appendicitis

Symptoms	Uncomplicated appendicitis (n=80)	Perforated appendicitis (n=80)	p-value
Diarrhea	17 (21.2)	35 (43.8)	0.002*
Nausea	48 (60)	46 (57.5)	0.187
Vomiting	46 (57.5)	48 (60.0)	0.341
Upper abdominal pain	18 (22.5)	29 (36.2)	0.158
Mid abdominal pain	5 (6.2)	15 (18.8)	0.789
Lower abdominal pain	16 (20)	16 (20)	0.091
Generalized abdominal pain	14 (17.5)	31 (38.7)	0.000*
Right lumbar quadrant pain	29 (36.3)	41 (51.2)	0.032*
Rebound tenderness	65 (81.2)	69 (86.2)	0.512
Radiation	33 (41.2)	47 (58.7)	0.075
Dysuria	44 (55)	43 (53.8)	0.814
Malaise	45 (56.2)	55 (68.7)	0.062
Anorexia	43 (53.8)	57 (71.2)	0.029*
Guarding in right iliac region	49 (61.2)	64 (80.0)	0.012*
Mass in right iliac fossa	4 (5.0)	24 (30.0)	0.000*
Fever	38 (47.5)	49 (61.2)	0.372

*significant result

Discussion

Appendicitis is the most common reason behind abdominal surgery throughout all age groups. the risk of developing appendicitis is 8% in a person's life. It has been stated that if not treated timely can lead to perforation, gangrene and abscess formation (10). If there is simply inflamed appendix then conservative treatment is enough to cure but if there is perforation then emergency surgery is the only option (2). Therefore, it is very important to differentiate simple

appendicitis from the perforated appendicitis so that early decision can be done regarding treatment options (12). Multiple scoring systems are using worldwide to differentiate these two conditions. Some of the studies used few parameters to differentiate uncomplicated and perforated appendicitis, these include raised level of C-reactive protein, neutrophil-lymphocyte ratio, altered serum bilirubin level and computed tomography (CT) scan. Studies revealed that these parameters are enough for the surgeon to confidently diagnose the perforated appendicitis (13-15). The drawback of using these parameters in the developing countries, are the expensive nature of the tests and unavailability in the emergency room. Therefore, bedside evaluation of patient on the basis of history and examination is useful in diagnosing perforated appendicitis.

American College of Emergency Physicians gave their recommendation in 2010 and stated that the bedside evaluation of patient's signs and symptoms are the satisfactory tool for diagnosing complicated appendicitis (16). Current study used 19 components for bedside evaluation of patient with appendicitis just to help in decision making regarding management option and type of surgical incision. In the current study only one laboratory parameter i.e. total leukocyte count, was used because of its easy availability even in basic health units and its affordability. Literature revealed male predominance in the case of perforated appendicitis (17) and the current study favored this finding but the results regarding gender difference were not statistically significant. Likewise, age difference was also present in both cases but again the difference was not significant. Some other studies done in the same geographical region also favored the current findings (11, 18).

Current study found that few signs and symptoms like diarrhea, generalized abdominal pain, right lumbar quadrant pain, anorexia, guarding in right iliac region and a palpable mass in right iliac fossa had a strong significant association with perforated appendicitis. Naderan et.al. conducted a study in 2016 and found that elder age group, diarrhea, malaise and right lumbar region pain were having a strong association with the presence of perforated appendicitis (11). It has been also noted in the current study that the patients with perforated appendicitis presented late in the hospital and tolerated pain for longer duration. Same results are found in the other studies as well so it has been recommended that early presentation in the emergency can prevent complication of appendicitis, early intervention can hold on the onset of peritonitis (19).

Conclusion

It can be concluded that the traditional bedside evaluation is a very good approach for diagnosing perforated appendicitis. The most common parameters like diarrhea, generalized abdominal pain, right lumbar quadrant pain, anorexia, guarding in right iliac region and a palpable mass in right iliac fossa are if present, the surgeon should be alert regarding possibility of perforated appendicitis.

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