The Value Of History Taking, Physical Examination In The Study Of Acute Appendicitis In Comparison To Histopathology

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ABSTRACT:

BACKGROUND:

Acute appendicitis is the most common surgical procedure all over the world, inspite of modem investigation like (MRI, CT scan, U/S) and others, the diagnosis of appendicitis remains essentially mixture of observation, clinical acumen and surgical science [1].

METHODS :

This prospective study was conducted during the period (from 1-10-2002 to 1-11-2004) based upon 113 cases presented as acute appendicitis 74 female, and 39 male.

RESULTS:

All these cases diagnosed preoperatively as acute appendicitis clinically, the correct preoperative diagnosis was in 82.5 %, wrong in 17.5 %.

CONCLUSION:

Most of the difficulty in diagnosis occur in females, the total number of the patient with negative laparatomy was 10 cases out of 113, "some of the cases presented with signs and symptom of acute appendicitis, proved to be other pathology by operative findings, which may also necessitate Laparatomy".

KEY WORDS: Acute appendicitis, histopathology ,History, physical exam.

INTRODUCTION:

Acute appendicitis can be difficult disease to diagnose; it's the most common surgical procedure [2].The pathology of acute appendicitis is divided grosto two types [3]: **1.** Non obstructive about 60%.
2. Obstructive by fecolith in the remaining 40%.

The pathology of non-obstructive appendicitis is that viral infection occurs in the lumen of the appendix especially the narrow lumen; this will induce odema and fluid exudation inside the lumen. Narrow lumen will cause obstruction to the lymphatics, veins and then later on arterial thrombosis and transmural infection which may lead to perforation and gangrene [1,3]. The pathology of obstructive appendicitis is the presence of fecolith, foreign body or more rarely worms (Pin worms) inside the lumen, obstruction will induce infection and inflammation of the appendix [3]. The gross appearance of the inflamed appendix was divided into three grades [2,3].

Grade 1 Simple cattarheal inflammation [4]:
Grade 2 Suppurative appendix:
Grade 3 Gangrenous, perforated appendix,

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obstruction by fecolith: Negative laparatomy is a hazard. Still present, delay in the diagnosis and operation is another hazard [5]. The percentage of negative laparatomy is still a big challenge especially when no other causes of acute abdomen are identified and need operation like (Meckel's diverticulitis, ectopic pregnancy, rupture ovarian cyst and others) [6].

AGE OF THE PATIENT:

The elderly patient with lax abdominal musculature, poor immunity and other systemic diseases (D.M, hypertension, I.H.D, I.B.S) makes the presentation atypical, they may harbor perforated appendix with no rigidity on clinical examination, and they progress so rapidly to gangrene and perforation [7].

In children difficulty in communication, history taking and anatomical factors (Short omentum, mobile intra peritoneal caecum) make the progression of the disease, more rapid and generalized peritonitis will occur if there is delay in the diagnosis or treatment [5,8]. Lunel and Murphy advice aggressive treatment in child suspected to have acute appendicitis (early appendectomy) [9].

Anatomical site of the appendix:

Will affect the presentation. The commonest site in order of frequency (1): Retrocecal appendix may present with mild tenderness and mild rebound tenderness [due to ballooning of the cecum by ileus (Silent appendix)] [1,4]. Post ileal and pelvicappendicitis may present with diarrhea (mucoid occasional blood) owing to the irritation of the ileum (Missed appendix) [4]. Pelvic appendix may present with signs and symptoms of UTI (cystitis, urgency, frequency, suprapubic pain). P-R is mandatory in examining patient with suspected acute appendicitis [10].**Drugs:** Used by the patient may affect the presentation. Early antibiotic use in patient suspected to have acute appendicitis in cattarheal inflammation may resolve the inflammation, but in the presence of grade II and III inflammation this will not arrest the inflammation, may progress to perforation and abscess formation if delay in operation occurs [11]. Preoperative dose of antibiotic help to reduce wound sepsis following appendectomy.

Antispasmodics may lead to paralytic ileus and reduce spasm, colic and the patient feels comfortable, while the inflammation progress leading to perforation. According to Addis DG, about 15% of the appendix was perforated in USA; the cause of perforation was inappropriate uses of antibiotics and antispasmodics by the G.P, with delayed operation.

PATHOLOGICALLY SPEAKING:

Obstructive appendix will progress more rapidly to perforation and gangrene, more than non-obstructive. The character of pain is different in obstructive; the pain is continuous and spasmodic, while in non-obstructive it wax and waves in frequency and amplitude [12,10]. In the females (in reproductive age group) misdiagnosis occurs. The incidence of normal appendix intra operatively in females was 37.5% of appendictomised female, while in males was 20% of total numbers of males, so most of the wrong diagnosis was in females. According to Roth Rock most of misdiagnosis of acute appendicitis occurs in females especially non-pregnant ladies [4]. The negative laparatomy leads to risk of surgery, anesthesia, postoperative care, social, economic problems and psychological consequences [5]. CT scan, MRI, and graded compression U/S. CT scan and MRI used mainly in complicated acute appendicitis i.e. detection of abscess, site, dimension and other pathology; but practically not applicable in the early diagnosis of acute appendicitis, its cost, limitation, availability of experienced radiologists are obstacles.

MRI still have minor role in the diagnosis of acute appendicitis. The new probe of U/S and new generation U/S is very effective in preoperative diagnosis [15,16,17,18].

PATIENT AND METHODS:

This prospective study is based upon systemic questionnaire for the patients presented to the emergency department of the first surgical unit, operated upon as acute appendicitis from t 1-10-2002 to 1-11-2004. Total number was 113 patients divided between 74 females & 39 males.

Each patient received questionnaire which includes full history, important symptoms, and full clinical examination; including the signs of acute appendicitis. Then we put some of the available investigation (W.B.C., G.U.E., plain abdominal X-ray, and abdominal U/S). All these cases were collected from emergency department and operated upon as emergency operation. The operative finding was put in the questionnaire and we put the histological results. So the questionnaire is divided to five parts: History from the patient, which include: age, marital status, pain character, duration and associated symptoms: anorexia, nausea, constipation, vomiting, gastric upset, post pain vomiting, shifting of pain and others. Female patients were asked about marital status, menstrual cycle, number of children, delivery by NVD or C/S, uses of oral contraceptive, I.U.C.D., past history of P.I.D. and Gynecological pathology. Medical history was; D.M, hypertension, renal stones, UTI and other family history of appendectomy. Clinical examinations include vital signs: blood pressure, Pulse Rate, temperature, then abdominal signs which include: localized pain in Mc Burney's point, tenderness, rebound tenderness, Rovsing's sign, Obturator sign, Psoas sign, Jerk sign and P-R was done for almost all cases. Systemic examination for signs of: jaundice, anemia and oedema also were included.

Investigations which include: W.B.C. count > 1000/m^3, G.U.E. to exclude UTI, urinary crystals; Hb %; B. urea; S. creatinine (for elderly patients); abdominal U/S (sometimes for females) ; Plain X-ray for exclusion of perforated viscus, and diagnosis of complication.

Intraoperative findings which include two major groups. Group A: Inflamed appendix with three grading discussed above. Group B**:** Non-inflamed, also divided into two major categories:

Negative laparatomy and no other pathology were detected. Other operative findings: e.g. ovarian cyst, ectopic pregnancy P.I.D., diverticulitis and

mesenteric lymphadenopathy. Histopathological results: histopathological examination done for all (113)cases, the missed histopathology was omitted from the total number.

After collection of the parameter reported above in the first three parts of the questionnaire we compare it with the results of operative and histopathology examination.

RESULTS:

113 cases were included in this study proved by histopathology; 74 females and 39 males. Those cases spread over wide age group, the youngest patient was 8 years old female; the oldest patient was 53 years old male.

The total number of females was almost double that of males. The correct preoperative diagnosis present in 82.5% and was false in 17.5%. Normal appendix in the total number of females form about 37.5%, while in males normal operative finding was 20% supported by histopathology. Most of the wrong diagnosis occurs in females.

The main age of presentation is the second and third decade of age. The median age is around 25 years old. Most of the patients presented in the first 24 hours from the incidence of symptoms which represents 63%, between 24-72 hours 34% and more than 3 days were 3% only. Most of those patients presented after 24 hours were females due to overlapping between cyclical, Gynecological and urinary symptoms with those of appendicitis. While most of the males present in the first 24 hours (more than 79%), 47% of females only present in the first 24 hours. Family history of appendicitis was not significant.

There are two presentations in acute appendicitis:

Typical presentation:

started as peri-umbilical pain followed by gastric upset; vomiting, anorexia then shifting of pain to the Rt. Iliac fossa with localized tenderness and rebound tenderness, mild fever with foeter oris supported by increase W.B.C. (Leukocytosis) > 11000/mm^3 and negative urine examination, supported by abdominal U/S if available. Typical presentation form 52.8% of all apppendectomised patients, 100% proved to be acute appendicitis by pathology.

Atypical presentation:

forms 47.2%, these include recurrent pain, pain started at RIF with no radiation of pain, dysuria, suprapubic pain, Rt. Hypochondrial pain, vaginal discharge, abdominal distension. These represent 47.2% of appendectomised patients. Those with atypical presentation, with proved acute appendicitis form about 62.5%, other pathology and negative laparatomy about 37.5%, more than 75% of those with atypical presentation occurs in female patients.

Most of the difficulties in the diagnosis were in females:

A- In females:

74 female operated upon as acute appendicitis; (29) of those with non-inflamed appendix (45) cases with inflamed acute appendicitis.

53 patients with atypical presentation divided between 14 males 39 females i.e. double the number of males. Percentage of inflamed appendix in female was 62.5% which equal to 50 cases. Percentage of non-inflamed appendix in female was 37.5% equal to 29 cases. Non-inflamed other pathology represents: 83.4% of the total percentage of non-inflamed appendix, which include the following (24 cases):

• Ovarian pathology (cyst, torsion and rupture) 41.8% =12 cases.

• Rupture Grafflan follicles 25% = 7 cases.

• Salpingitis and P.I.D. 16.6% = 5 cases.

Non-inflamed appendix and no other Intraoperative pathology:

(Female with negative laparatomy) include 16.6% = 5 cases.

B- In males:

39 males operated upon as acute appendicitis, 20% of them have no appendicitis which represents 8 cases, while 31 cases proved histologically as acute appendicitis, of those 8 cases only one case presents with mesenteric lymphadenopathy and diagnosed after taken lymph nodes biopsy as non-specific lymph adenitis, he was 11 years old.

The other 7 cases 2 of them had previous history of UTI and genitourinary symptoms and positive urine examination, but we operated upon these cases because of overlapping in symptoms signs of acute appendicitis.

Five cases in female with no operative findings so the total number of negative laparatomy was 5 males and 5 females; 10 cases out of 113 cases which represent 8.8% with negative laparatomy.

Table (1) Distribution of age among male and female

Age in years	Male	Female
< 11	3	5
11 - 20	12	12
21 - 30	11	28
31 - 40	7	13
41 - 50	4	10
51 - 60	2	6
60 >	-	-
Total	39	74

Table (2) Time of presentation in hours

Time of Presentation (In Hours)	% of Total Number	% of Acute Appendicitis
< 24 hours	63	71
25 – 48 hours	30	78
49 – 72 hours	4	48
> 72 hours	3	13

Table (3)Classification according to the histopathology

Type	%
Simple acute appendicitis	51
Suppurative appendicitis	23
Gangrenous appendix	7.5
Non-inflamed appendix	18.5

Table (4) The relationship between sex and inflamed and normal appendix

Sex	Normal Appendix	Inflamed Appendix
Female	37.5 %	62.5 %
Male	20 %	80 %

Table (5) Classification according to typical and atypical presentation

Group	%	Inflamed
Typical presentation	52.8	100 %
Atypical presentation	47.2	62.5 %

Table (6) Frequency of presentation of signs and symptoms and investigation in the acutely inflamed appendix

Parameter	% of Presentation
Signs & Symptoms	
Anorexia	100
Pain in the RIF	92
Tenderness in the RIF	92
Rebound tenderness in the RIF	90
Post colic vomiting	89
Shifting of pain	85
Fever > 37.2 ºC	84
Positive cough impulse	75
Guarding in RIF	69
Rigidity in RIF	63
Positive Rovsing's sign	53
Positive Psoas' test	38
Obturator signs	31
Investigations	
W.B.C. > 11000/mm^3	61
Negative G.U.E	85
Positive G.U.E	15

Table (7) Shows specificity, sensitivity and Accuracy of each parameter

Parameter	specificity	Sensitivity	Accuracy
Pain	20	100	81.8
Shifting of pain to the R.I.F	80	61.5	77.7
Vomiting	50	84.6	79.16
Anorexia	100	100	100
Fever	50	71.4	73.07
Change in the bowel habit	80	23.07	65.6
Tenderness	20	22.85	81.8
Rebound tenderness	20.5	92.307	77.27
Psoa's sign	50	23.07	61.29
Rovsing' sign	75	38.46	66.6
Obturator sign	75	15.38	62.5
Cough impulse	75	84.61	86.9
Guardin	25	84.61	75.0
Rigidity	70	23.07	67.7
Negative bowel sound	50	61.35	73.07
W.B.C. > 11000	75	30.76	66.6
Negative G.U.E	50	15.38	59.37

Table (8) *Comparison between present study and other studies

Author	Country	Year	Accuracy	% of Perforation
Per Jessal	Denmark	1981	70 %	1.6
Boremaetd	Australia	1981	70 %	6.3
Russell	Washington (USA)	1986	81.44 %	18.55
Davidy ony	California (USA)	1989	93 %	33
F. Al-Tikriti	Iraq	1992	77 %	10.24
Waiia Al-Qassi	Iraq	1998	88.9 %	9.8
Aws Nazar	Iraq	2002	82.5 %	11.8

DISCUSSION:

The total number of cases was 113 case, 74 female and 39 male, the peak incidence in the third decade around 25 years old age, as median age group. This coincides with average number in western countries according to Addis DG; (epidemiology of acute appendicitis in USA) [2]. Most of our patients presented to us in the first 24 hours of starting the signs and symptoms this represent 63% of the cases. Those who are referred from other hospitals or other branches of medicine were about 30%, it is striking that those who present in the first 24 hours have high incidence of appendicitis about 71%, and there is a decrease in the frequency of appendicitis following 3 days, Those present after 72 hours the incidences of acute appendicitis present 3% only [2,5]. These results are comparable with the results in the other studies[2,4]. Most of the error in the diagnosis was in females, with 37.5%, while in males about 20% with false diagnosis.

The total number of patients operated upon 113 cases; 37 cases with no appendicitis (17.5%) and those (82.5%) have acute appendicitis. This goes with standard level in our country and Middle East countries, but it is less than the standard in the Western countries. In Western countries the correct diagnosis was present in 85% according to Al-Varado. A; his scoring system was able to diagnose acute appendicitis confidently in about 90% of cases [19]. In the present study, family history has low significance in the diagnosis of acute appendicitis this coincides with the result of previous study in Western countries [12]. The false diagnosis in females is due to overlap between the gynecological problems and signs and symptoms of acute appendicitis, no pregnant lady is included in this study, so most of female represent reproductive age group [4,14]. The role of ultrasonic examination in female is essential to exclude other pathology related to the ovaries and genitourinary symptoms [16,17,18]. U/S has its role in the diagnosis of acute appendicitis, in female and male especially the graded compression U/S Jeffery R.B**,** advice the surgeon to put U/S examination as part of general examination in patients suspected to have acute abdomen [20]. The role of good history and physical examination is important in the diagnosis of acute appendicitis [6,7]. According to this study anorexia is present in all cases proved histologically as acute appendicitis. Pain as peri-umbilical pain or Rt. Lower quadrant pain is present in 92% of cases; other 8% has deep pain or by P-R, hypo gastric pain and Rt. Hypochondrial pain [11,21]. Dixon put the role of P-R examination in patient with suspected appendicitis and the site of pain in the suprapubic area, tenderness by P-R usually help in the diagnosis acute appendicitis, in patient with signs and symptoms of acute appendicitis especially pelvic appendix [10].

Al-Varado in his scoring system put score for shifting of pain but not for pain per se [19].

Tenderness and rebound tenderness in RIF present in about 90% of acute appendicitis, its sensitivity is about 92.3 but it is not specific, its specificity is around 20.5. Absence of tenderness and rebound tenderness may occur due to obesity, abdominal laxity, antispasmodics use and anatomically deep appendix[1,13]. Nausea, vomiting and anorexia are important in the diagnosis of acute appendicitis.

Schwartz's advice to revise the diagnosis of acute appendicitis if anorexia is not present [4]. Al-Varado put score for anorexia in his scoring system [19]. In our study the sensitivity and specificity of anorexia was 100, this goes with what Seymour Schwartz said about anorexia. Post colic vomiting is significant in the diagnosis of acute appendicitis, its sensitivity is about 84.6 and its specificity is about 50. It is protective mechanism to arrest the bowel in the presence of acutely inflamed appendix [22]. Shifting sign i.e. shifting of pain from peri-umbilical area to the RIF mainly Mc-Bumey's point, in our study it is sensitive in 61.5 & its specificity about 80% and its accuracy is 77.7.

Eskelinen in 1995 stress the importance of shifting of pain in acute appendicitis, AL-Varado A; put score in his scoring system for shifting of pain[12,19]. Shifting of pain to the RJF is highly indicative of acute appendicitis and excluding UTI, renal colic and Gynecological pathology. Anorexia, pain, tenderness in the RIF and shifting diagnose acute appendicitis in more than 95%. According to AL-Varado scoring system [19]. Other signs like Rovsing's, Psoas's signs and Obturator sign present in 30% -50% of cases, with low sensitivity but > 75 specificity. The low sensitivity due to the occurrence of these signs in specific type of appendix (pelvic and pos-ileal type) which present in low percentage of anatomical site. But it has high specificity in acute appendicitis. According to our study rigidity implies perforated appendix or abscess, the patient with rigid RIF operated upon and proved to be appendix in more than 85% have peri-appendicular inflammation or perforation with or without gangrene. Rigidity is less sensitive around 23.07it's subjective sign according to the examination, but highly specific for acute appendicitis about 70.0. This result comparable with that of other study, rigid RIF implies irritation of peritoneum by inflammation, blood and faecal materials; in contrast it's not sensitive in elderly owing to lax abdominal musculature. Fenyo in 1982 discuss that in elderly patients rigidity is not almost always present in acute abdominal condition per se, so he advice to concentrate more on elderly patients with no rigidity in suspicion of acute abdomen [7]. Cough impulse although not written in the textbook, but in our study its sensitivity is about 84.6 and it is specific in 75, especially if the pain is localized in the RIF, it indicates inflamed intra-abdominal organ, that touch and irritate the parietal peritoneum.

Bennett in 1994 stress the use of cough impulse in patients with acute appendicitis, and he said that the presence of positive cough impulse in patient with anorexia and RIF pain indicate acute appendicitis over 95% of cases [8].

Elevation of temperature is present in 84% of patients . Fever may occur in any intra-abdominal condition like UTI, P.I.D., mesenteric lymphadenitis and any cause of irritation of the peritoneum. The available investigations include W.B.C it is significant if it is more than 11000/mm^3, it is present in 61% with moderate sensitivity and specificity, it is affected by any inflammatory response and body immunity; it is not specific nor sensitive. It has its role in supporting the diagnosis and its role in perforated appendix is significant when its count > 20000/mm^3 [6]. Groffen in USA in 1996 said that the role of W.B.C is low in the diagnosis of acute appendicitis; nevertheless it's important in perforated appendix and pelvic abscess. Its low count does not exclude acute appendicitis [3,13]. The role of U/S in acute appendicitis is not only in the diagnosis but also in the differential diagnosis.

Jeffery in 1994 and pitfall's in 1995 stress the importance of U/S in preoperative diagnosis of acute appendicitis. Graded compression U/S newly appears as a diagnostic tool in acute appendicitis [16,20]. Oomss and Kanmou's in USA put ultrasonic examination mandatory in preoperative patients with suspected acute appendicitis and pelvic pathologies[17].

CONCLUSION:

Acute appendicitis can be very difficult disease to diagnose. In spite of modem investigations and radiological aids in the diagnosis of acute appendicitis still it is a clinical diagnosis.

Difficulty in diagnosis in female due to overlapping between signs and symptoms of acute appendicitis with that of genitourinary symptoms.

Some of the symptoms and signs should be present for the diagnosis of acute appendicitis like anorexia, pain, tenderness, shifting of pain, tenderness, rebound tenderness and cough impulse.

Some of the symptoms and signs are neither specific nor sensitive like: fever, rigidity, pre-colic vomiting; some of the investigations like W.B.C also not significant in the diagnosis of acute appendicitis. Ultrasonic examination is important to exclude other pathology and diagnosis of acute appendicitis by graded compression ultrasound.

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