

# Critical Review of Acute Appendicitis in Females

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Acute appendicitis is the most common cause of emergency abdominal surgery worldwide. The most difficult group for diagnosis are children, elderly and above all the women of child bearing age. The purpose of this study was to ascertain the diagnostic accuracy based on clinical findings and incidence of negative appendectomy in female patients. This prospective study was conducted in West Surgical Unit, Mayo Hospital, Lahore for the period of one year. One hundred adult females underwent appendectomy during this period in emergency department. Majority of the patients were in their 2<sup>nd</sup> and 3<sup>rd</sup> decade of life. 67% patients had uncomplicated acute appendicitis, 23% had complicated acute appendicitis and 10% had normal appendix. The highest percentage of complicated cases were seen in patients over 50 (60%) and 8 out of 10 patients with negative appendectomy presented between 12-30 years. Most common (67%) position of appendix was retrocaecal. Incidence of negative appendectomy in this study is quite low.

**Key words:** Appendicitis, negative appendectomy

Acute appendicitis alone is responsible for 10% of all emergency abdominal surgery. It represents a diagnostic and therapeutic challenge to physician of specially surgeon. It is reported that every 5<sup>th</sup> human (7%) will suffer from acute appendicitis in his life time. In adolescent girls and premenopausal women, urinary tract infection and gynaecological pathologies may mimic appendicitis. Perforation in females is more common, 20.5% as compared to 11.1% in males, complicated appendicitis during pregnancy has been associated with increase in premature labour and fatal and maternal death. The negative appendectomy rate in women of reproductive age is 45% as compared with 18% in all other patients. There is no way to prevent the development of appendicitis. The only way to reduce morbidity and mortality is to perform appendectomy before perforation or gangrene occurs.

## Material and methods

This study was conducted in West Surgical ward, Mayo Hospital, Lahore. One hundred female patients who underwent appendectomy during the period of one year (January 1998 to January 1998) were included in this study. They present during the emergency duties of this unit. They all were above the age of 12 years, as patients below this age are dealt with in Paediatric Surgery Unit in this hospital. Patients who underwent interval/ incidental appendectomy were not included in the study.

## Results:

Results are summarized in the following tables.

Table 1 Distribution of patients according to age group (n=100)

Age groups (Years)	No. of patients
12-20	46(46%)
21-30	30(30%)
31-40	12(12%)
41-50	7(7%)
51-onwards	5(5%)
Total	100

Table 2: Overall appendiceal pathological findings (n=100)

Pathological Diagnosis	n=	%age
Normal appendix	10	10
Simple acute appendicitis	67	67
Perforated/gangrenous appendicitis	23	23
Total	100	100%

Table 3: Incidence of negative appendectomy in different age groups

Age Group(Years)	n=	%age
12-20	6/46	13.04
21-30	2/30	6.66
31-40	1/12	8.33
41-50	1/7	14.2
51-onwards	0/5	-
Total	10/100	10%

Table 4: Alternate diagnosis in negative appendectomies (n=10)

Alternate Diagnosis	n=	%age
Haemorrhagic solitary right ovarian cyst	4/10	40%
Non specific mesenteric lymphadenitis	1/10	10%
Tuberculous stricture distal ileum	1/10	10%
Caecal growth (adenocarcinoma)	1/10	10%
No definite pathology	3/10	30%
Total	10	100%

Table 5: Positions of appendix

Position	No. of Patients	%age
Retrocaecal	67/100	67%
Pelvic	14/100	14%
Post-ileal	7/100	7%
Pre-ileal	5/100	5%
Paraecaeal	5/100	5%
Subhepatic	2/100	2%
Total	100	100%

Table 6: Post operative complications

Complications	Simple Appendicitis (n=67)		Complicated Appendicitis (n=23)		Normal Appendix (n=10)	
	n=	%age	n=	%age	n=	%age
Infection	4	5.9	2	8.7	-	-
Ileus	4	5.9	3	13.04	-	-
Pyrexia	2	3	3	13.04	-	-
Pelvic abscess	-	-	1	4.34	-	-
Total	10	14.92	9	39.13	-	-

Table 7 Review of clinical features in case of negative appendicectomies

Symptoms	n=	%age	Signs	n=	%age
Pain RIF	10	100	Tenderness RIF	10	100
Vomiting	03	30	Rebound tenderness	05	50
Nausea	02	20	Pyrexia	01	10
Urinary Symptoms	03	30	Obturator Test	03	30
Diarrhoea	03	30	Rovsing's sign	02	20
Constipation	01	10	Psoas Test	05	50
Anorexia	01	10	Tachycardia	06	60
Fever	01	10			

Table 8: Appendiceal pathological findings in different age groups

Pathological diagnosis	12-20 (n=46)	21-30 (n=30)	31-40 (n=12)	41-50 (n=7)	51-onward (n=5)
Simple appendicitis	32 (69.6%)	22 (73.3%)	7 (58.3%)	4 (57.1%)	2 (40%)
Complicated appendicitis	8 (17.3%)	6 (20%)	4 (33.3%)	2 (28.5%)	3 (60%)
Normal appendix	6 (13%)	2 (6.6%)	1 (8.3%)	1 (14.2%)	-

**Discussion**

In this series, majority of the patients were seen in second and third decade of life i.e. 46% and 30% respectively.

Khalid Malik has also quoted maximum age incidence in second and third decade of life<sup>1</sup>. Median age in this study was 21.5 years, which is comparable with 20 years in another study by Madiba TE<sup>2</sup>.

From different series, it can be concluded that "Acute appendicitis is a disease of the young and adolescent"<sup>3</sup> although no age is immune to it. Pelto-kallio has concluded for unknown reasons that overall incidence of acute appendicitis appears to be declining while the proportion of patients in the later decades of life is rising<sup>4</sup>.

The declining incidence above the age of thirty is probably because the amount of lymphoid tissue in the appendiceal wall decreases above this age. It has also been postulated that the mouth of appendix is wide in the newborn babies, gradually narrows during childhood till adolescence and becomes wide in old age. This may be responsible for obstruction - infection - more obstruction - more infection - vicious cycle so commonly attributed as the causal factor in the aetiology of acute appendicitis.

All the patients in this study presented more or less in the same way as mentioned in the literature. In patients with negative appendicectomy, anorexia (20%), fever (10%) and vomiting (30%) were present in comparatively less number of patients. These results are in accordance with other studies. Amir<sup>5</sup> in his study of 210 patients has mentioned pain as main complaint which brought the patients to the hospital. He further described the symptoms in three different pathological groups i.e. normal appendix, simple acute appendicitis, and complicated appendicitis. According to him<sup>5</sup>, vomiting or nausea was reported in 33.3, 61.7 and 92.8 percent and anorexia in 53.3, 76.6 and 82.1 percent of cases in three groups respectively. The mean temperature was normal in negative cases, 99.2°F in

simple acute appendicitis and 100.4°F in complicated appendicitis. 55.1% patients with simple acute appendicitis and 28.6% in complicated appendicitis had normal temperature.

The rate of negative appendicectomy in this series was 10%. This is comparable with other published series which gave 31%<sup>6</sup>, 45.6%<sup>7</sup>, 20%<sup>8</sup>, 26%<sup>9</sup>, 17%<sup>10</sup>, 24.4%<sup>11</sup>, 8.8%<sup>12</sup>. In local studies, this rate had been as low as 4.9<sup>2</sup> and as high as 19%<sup>3</sup>. This had been quite high in international series, approaching 46.4%<sup>13</sup> in one of them. So incidence of negative appendicectomy in the present series and also in other local series is quite lower than that in international series. This may be because of genuine or morbid fear of surgery and only patients with severe intra-abdominal ailments may opt for operation, making a natural selection of the substrate. Another reason may be late presentation in our circumstances, in which minor self-limiting ailments mimicking appendicitis in early stages are already cured and do not present for surgical opinion.

This study also revealed that diagnosis of acute appendicitis had been more confusing in young patients. Eight patients out of ten with negative appendicectomy were between 12 and 30 years. The diagnosis of acute appendicitis in these patients is difficult for two reasons. First one is the special period in the development of the female body and the second one is the fact that female genitals are more often affected by the disease<sup>132</sup>. Also rupture of Graffian follicle in young girls and pelvic inflammatory disease in married females so commonly resemble appendicitis that a decision in favour of surgery is made.

The overall rate of gangrenous/perforated appendicitis was 23% in this study. This is comparable with other published series which gave 17.2%, 18.3%, 31.5%, 43%, 21%.

It is quite evident from comparison of different series that gangrenous/perforation rate in acute appendicitis is quite high in our circumstances. This is probably due to improper referral system (due to quackery and ignorance about the disease) and reluctance of the patient for surgery. Delay in seeking opinion or in diagnosis due to failure to appreciate the clinical findings are the other principal factors responsible. Last factor but not the least is the post-admission delay in performing operation which usually takes about 10-12 hours. It is a sad state of affairs that this common disease is allowed to progress to such an advanced stage in nearly 1/5<sup>th</sup> of patients. This not only increases the morbidity but is responsible for mortality as well.

A noteworthy feature of the study was that the rate of gangrenous/perforation increases with advancing age with a steep rise above the age of fifty years. Out of 5 patients, who were above the age of fifty, three had gangrenous/perforated appendicitis (60%). This high incidence results in the highest rate of complications and also accounts for most of the deaths. In other series, perforation rate in patients over fifty was found to be 46%,

49%, 67% and 37%. It appears that figures have not changed significantly in recent years.

Gangrene and perforation in old age may be because of atherosclerosis of the appendicular artery which leads to early occlusion once inflammation is established. Other factors implicated include, atrophy of the greater omentum with reduced ability to seal the area of infection and non-expansibility of the appendiceal wall with build up of high intra-luminal pressure much earlier.

Table 9: Comparative study of different series regarding diagnosis

Series	n=	Normal appendix		Simple acute appendicitis		Complicated appendicitis	
		No.	%	No.	%	No.	%
Adesunkenn <sup>14</sup>	54	12	22	37	68.7	5	9.3
Lewis <sup>1975</sup> <sup>15</sup>	1000	201	20.1	588	58.8	211	20.1
Silberman <sup>16</sup> 1981	1013	149	14.7	699	66.4	165	18.9
Jess <sup>17</sup> 1981	202	60	29.7	119	58.9	23	11.39
Young <sup>18</sup> 1989	196	12	6	69	35	115	59
Amir <sup>5</sup> 1991	210	15	7.2	167	79	28	13.3
Jamilur Rehman <sup>19</sup> 1985	230	41	18	144	62.6	45	19.58
Ijaz <sup>3</sup> 1993	1156	158	13.7	761	65.8	237	20.5
Khalid <sup>1</sup>	354	20	5.6	247	69.8	61	16.2
Ali Akbar <sup>20</sup> Ghumro 1996	258	22	8.53	122	47.2	114	44.18
Levy <sup>13</sup> , 1997	212	44	46.4	122	57.5	46	21.69
Present study 1998	100	10	10	67	67	23	23

Rupture of solitary ovarian cyst on right side was the most common (40%) alternate diagnosis in cases of normal appendix. This is comparable with Amir's series which gave ruptured ovarian follicle in two out of three cases of normal appendix. In another series of 632 female patients with acute appendicitis, 139(22%) had genital diseases alongwith appendicitis catarrhalis, despite the negative conclusion of the gynaecologist: solitary complicated ovarian cyst in 25 cases (18%); extra-uterine pregnancy in 14 cases (10.1%); ovarian polycystosis with complicated cysts in 44 cases (31.6%); salpingitis and pelvioperitonitis in 56 cases (40.3%). In a series of 338 patients<sup>127</sup>, exploration revealed only acute appendicitis in 283 cases, while 44 had acute appendicitis plus a co-incision of a large paratubal cyst, five had a ruptured corpus luteum.

Appendix was most commonly (67%) found in retrocaecal position, which is in accordance with other published series.

There were no operative complications in this study. The number and severity of complications was significantly high in the complicated cases (39.13%) as opposed to 14.92% in uncomplicated cases. There were no postoperative complications in negative exploration in this study as well as in Amir's series, but he had mentioned

significantly higher percentage of complications (57.2%) in complicated appendicitis and comparatively lower percentage of complications (8.9%) in simple acute appendicitis..

Table 10 Comparison of different series regarding age group

Name of series	Maximum %age of patients seen in	
	2 <sup>nd</sup> Decade	3 <sup>rd</sup> Decade
Lewis <sup>15</sup>	32%	34%
Ijaz Ahmad <sup>3</sup>	23%	29%
Hassan <sup>22</sup>	50%	32%
Amir <sup>5</sup>	44.8%	30%
Present series	46%	30%

Table 11. Comparison of different series regarding position of appendix

Position of Appendix	Present series	Khalid's Series <sup>1</sup>	Gladstone's Series	J.A.Luja n Series <sup>21</sup>
Retrocaecal	67%	72%	69.2%	70.5%
Pelvic	14%	20%	27.5%	27%
Subhepatic	2%	0.8%	0.033%	3.5%
Post-ileal	7%	4%	0.5%	-
Pre-ileal	5%	1.2%	0.9%	-
Paracaecal	5%	2%	1.86%	-

After overall critical evaluation of the results, it was concluded incidence of negative appendectomy can be reduced by careful history and repeated clinical examination, but one should be vigilant enough to operate if symptoms do not settle.

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