ORIGINAL ARTICLE

Frequency of histologically confirmed acute appendicitis in clinically diagnosed cases

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Abstract

Background: Appendectomy for acute appendicitis is the most commonly performed operation in the world. Negative appendectomies are no longer considered acceptable due to increased morbidity and mortality and increased hospital costs and may be avoided by using pre-operative radiological imaging or diagnostic laparoscopy.

Aim and objectives: To determine the frequency of histologically confirmed appendicitis on the basis of clinical suspicion and to determine the rate of negative appendectomies.

Place and duration of study: Department of Surgery, Ayub Teaching Hospital, Abbottabad from July 2020 to January 2021.

Material and Methods: This cross-sectional study was carried out in 245 presenting with features suggestive of acute appendicitis through non-probability consecutive sampling. Data was collected on a structured proforma and analyzed using SPSS 20.

Results: Histologically 149(61%) patients had acute appendicitis while 96(39%) patients did not have appendicitis.

Conclusion: Our study concludes that the frequency of histologically confirmed appendicitis was 61%, among patients subjected to appendectomy on the basis of clinical suspicion.

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Introduction:

Appendectomy for acute appendicitis is the most commonly performed operation in the world.[1] Appendix is a small pouch attached to beginning of large intestine.[2] Appendicitis is most common abdominal emergency with lifetime risk of appendectomy of 12% for men & 25% for women.[3] It is more common between the ages of 10 to 30 years. If left untreated, this diseased appendix has the potential for severe complications, like perforation or sepsis.[3] Traditionally, acute appendicitis has always been a clinical diagnosis based on patient history, physical examination, and laboratory testing.[4] Previously high percentage of negative appendectomies (20%) were considered reasonable, based on premise that delay would inevitably lead to perforated appendicitis and thus increased morbidity and even mortality.[5] This classical practice is currently being abandoned by most surgeons, as negative appendectomies are no longer considered acceptable. They carry a substantial morbidity, increase hospital costs and may be avoided by using pre-operative radiological imaging or diagnostic laparoscopy.[6] Despite advances in technology and imaging modalities, there is dilemma in the diagnosis of acute appendicitis, however histo-pathological examination still remains the gold standard for the confirmation of appendicitis.[7] There is evidence that intra-operative normal appendices may have abnormal incidental finding at cytology level and practice of sending appendectomy specimens for routine histo-pathological ex-

Table 1: Age Distribution

Age	Frequency	Percentage
18-30 years	71	29%
31-50 years	174	71%
Total	245	100%

amination differs between centers as well as the literatures.[8] In one previous study, acute appendicitis on histo-pathology was recorded in 52% of patients suspected of having appendicitis preoperatively.[9] However, it was recorded in 79.3% of patients in another study.[10] In another study, it was recorded in 35.5% of patients.[11]

The present study is designed to determine the frequency of histologically confirmed appendicitis among patients who were subjected to appendectomy on the basis of clinical suspicion. As mentioned earlier, if not operated in time and if remains undiagnosed, the appendix can proceed to further inflammation and ultimately necrosis of the inflamed appendix which adds further gravity to the complications. Moreover, the high incidence of negative appendectomy and variation in the rate of histologically confirmed appendicitis from one setting to another made us to detect its magnitude in our local population. This study will provide us with local magnitude of histologically confirmed appendicitis among patients subjected to appendectomy. The results of this study will be shared with other local surgeons to make them aware about the problem and deciding about future research and preventive strategies.

Material and Methods:

This cross-sectional study was conducted in the Department of Surgery, Ayub Teaching Hospital, Abbottabad from July 2020 to January 2021. Patients of either gender with age ranging from 18 to 50 years, presenting with features suspicious of acute appendicitis i.e. sudden onset of right iliac fossa pain, vomiting, TLC more than 11,000 and tenderness in right iliac fossa were included in the study. Exclusion criteria was patients with history of surgical intervention in abdomen in last one month, renal insufficiency (serum urea of > 50mg/dl and creatinine of >1.1mg/dl), as these conditions act as confounders and if included had introduced bias in study results. Sample size was 245 keeping 35.5%[11] proportion of histologically confirmed appendicitis, 95% CI and 6% margin of error. Sampling technique was non probability consecutive sampling. The study was conducted after approval from hospitals ethical and research committee. All patients presenting to out-patient department with high suspicion of acute appendicitis were included in the study. The purpose and benefits of the study was explained to the patient, they were assured upon the purpose and benefits of the study, the risks involved and they were explained that the study was done purely for research and data publication and if agreed upon a written informed consent was obtained from patients. Detailed history and clinical examination was done in all patients and were subjected to appendectomy in clinically diagnosed appendicitis. Operated samples were sent for biopsy. All surgeries were performed by a general surgeon using the same standard technique and all the biopsy specimens were examined by a single histo-pathologist having minimum experience of 5-years. The above-mentioned information was recorded on a pre designed proforma. Strict exclusion criteria were followed to control confounders and bias in the study results. The data collected was analyzed in SPSS version 20. Mean±SD was calculated for continuous variables like age and BMI. Frequencies and percentages were calculated for categorical variables like gender and histologically confirmed appendicitis. Chi-Square test was applied on post-stratification of age, gender and BMI in which P Value < 0.05 was considered as significant value to identify effect modification.

Results:

In the present study a total of 245 patients were observed in which 71(29%) patients were in age range 18-30 years, 174(71%) patients were in age range 31-50 years. Mean age was 44 years with standard deviation ±5.03 as shown in table no.1. 145(59%) patients were male and 100(41%) patients were female. 105(43%) pa-

Table 2: Histologically confirmed appendicitis

Age	Frequency	Percentage
18-30 years	71	29%
31-50 years	174	71%
Total	245	100%

tients had BMI ≤25 Kg/m^2 while 140(57%) patients had >25 Kg/m^2. Mean BMI was 29 Kg/m^2 with SD ± 5.01. Histologically confirmed acute appendicitis was found in 149(61%) patients while 96(39%) patients did not have acute appendicitis on histo-pathology as shown in table no 2.

Discussion:

Appendix is a small pouch attached to the beginning of large intestine.[2] Appendicitis, an inflammation of the appendix, is the most common acute surgical condition of the abdomen with lifetime risk of appendectomy of 12% for men and 25% for women.[3] If left untreated, this diseased appendix has the potential for severe complications, like perforation or sepsis.[3]

Diagnosis of appendicitis is often a clinical challenge because appendicitis can mimic several abdominal conditions.[4] Our study shows that among 245 patients 71(29%) patients were in age range 18-30 years, 174(71%) patients were in age range 31-50 years. Mean age was 44 years with standard deviation ± 5.03. 145(59%) patients were male and 100(41%) patients were female. 105(43%) patients had BMI ≤25 Kg/m^2 while 140(57%) patients had >25 Kg/m^2. Mean BMI was 29 Kg/m^2 with SD±5.01. Histologically confirmed acute 126 appendix was analyzed as 149(61%) patients had acute appendicitis confirmed on histo-pathology while 96(39%) patients had acute appendix not confirmed on histopathology. In another study conducted by Jat MA et al[9] had reported that out of 480 specimens of appendix, appendicitis accounted for 466(97.0%) with peak occurrence in the age group of 11 to 50 years in male and 11 to 40 years in female.

Histo-pathological diagnosis include acute appendicitis 250(52.0%), suppurative appendicitis 135(28.0%) acute gangrenous appendicitis 60(12.5%), perforated appendicitis 9(2.0%), chronic appendicitis 12(2.5%). Negative appendicectomy rate was 14(3%) and two time more common in female with peak occurrence in the age group of 20-30 yrs. There was no unusual histological finding like carcinoid tumour of appendix.

In another study conducted by Abd Al-Fatah M et al[10] had reported that there were 265 men and 195 women [sex ratio (male/female): 1.4] aged between 16 and 62 years (mean: 27.6 years). All patients underwent open appendectomy. Histological examination of the surgical specimen showed normal appendix in 28/460(6%) cases, gross inflammation in 365(79.3%) cases, gangrenous appendix in 32(7%) cases, perforation and localized peritonitis in 30(6.6%) cases, and generalized peritonitis in 5-(1.1%) cases. Incidental unexpected pathological diagnoses were noted in 39(8.5%) appendectomy specimens.

They included Enterobius vermicularis (n=19), mucinous neoplasms (n=3), neuro-endocrine tumors (n=1), granulomatous inflammation (n=12), tuberculosis (n=1), bilharziasis (n=1), and endometriosis (n=2). Other associated pathological findings were ruptured ovarian cyst (n=9), perforated duodenal ulcer (n=3), Meckel's diverticulum (n=1), disturbed ectopic pregnancy (n=3), and caecal adeno-carcinoma (n=2).

In another study conducted by Patel MM et al[11] had reported that total 400 cases were reviewed. Out of these, clinically suspected appendicitis was found in 365(91.3 %) cases including spectrum of appendicitis (acute, subacute, chronic, ulcerative, suppurative, necrotizing, gangrenous, acute with peri-appendicits, acute on chronic). Unusual unexpected findings were found in 20(5%) cases (tuberculosis, amoebiasis, faecolith, congestion with sickle RBCs, mucocele and neoplastic lesions including carcinoid, adenocarcinoma, mucinous cystadenoma). In another study conducted by Salahuddin O et al[12] had reported that a total of 75-patients presented with

acute abdominal pain. Of them 42 were admitted with tenderness in right iliac fossa and lower abdomen. Finally, 36(48%) were diagnosed as acute appendicitis and were included in the study. There were 20(56%) men and 16(44%) women with age range of 60 to 78 years and a mean age of 65.5±4.2 years. Associated illness occurred in 25(70%) patients. Symptoms included abdominal pain in 32(90%), nausea in 17(48%), and emesis in 9(25%) patients. Signs included right lower quadrant tenderness in 26(74%) patients, leukocytosis in 17(47.2%), and fever (>99°F) in 11(30.5%). Laparoscopy was used as an important diagnostic as well as therapeutic modality. Of the patients, 9(25%) had gangrenous appendix, while 12(33.3%) had perforated appendix. A total of 12(33.4%) patients developed complications. Hospital stay was considerably increased in patients with a delayed diagnosis (5-7 days), perforations (5-9 days) and post-operative complications (5-15 days). One patient, a known case of ischemic heart disease, died of cardio-pulmonary arrest.

Conclusion:
Our study concludes that the frequency of histologically confirmed appendicitis was 61% among patients subjected to appendectomy on the basis of clinical suspicion.

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Role and contribution of authors:
Shawana Asad, collected the data, references and did the initial writeup.

Rabeeha Bashir, collected the data and helped in introduction writing.

Waqas Ahmed, collected the references and helped in discussion writing.

Mir Jalal-ud-din, critically review the article and did the useful changes.

Muhammad Zubair Afzal, collected the data and helped in compling the data and result writing.

Sher Ali Khan, collected the data, references and helped in discussion and conclusion writing.

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