



A STUDY ON CLINICOEPIDEMIOLOGICAL PROFILE OF ACUTE APPENDICITIS IN TERTIARY CARE HOSPITAL IN THE KUMAUN REGION OF UTTARAKHAND

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ABSTRACT **INTRODUCTION:** Acute appendicitis is one of the most common acute abdominal surgical pathologies. It usually affects teenagers and young adults but may occur at any age. Only half of the patients have a typical presentation. One-quarter of patients report no preceding visceral pain. Vomiting may be absent and diarrhoea may occur in some patients. Some cases may have a delayed presentation. An atypical presentation is more common in very young, elderly, pregnant and immunosuppressed patients. This study is undertaken to find out the incidence in Dr. Susheela Tiwari Government hospital, Haldwani and also to study the clinical and epidemiological profile of the disease like age, sex, clinical manifestations and management of acute appendicitis. **METHODS:** All confirmed cases of acute pancreatitis in 2 years of study period based on clinical, hematological, radiological findings were included in this study. All data concerning etiology, length of hospital stay, treatment, complications and deaths were recorded and analyzed in all patients forming study group. All data concerning etiology, length of hospital stay, treatment, complications and deaths were recorded and analyzed in all patients forming study group. BISAP score and Ranson's score were calculated in all such patients. **RESULTS:** Majority of the cases (60.7%) were males with male to female ratio of 1.54:1. The age of the patients ranged from 11-75years, with mean age of 33.17±16.4. Majority of patients (80%) aged up to 40years. Almost all patients had leucocytosis (98.37%)> migratory right iliac fossa pain (97.3%)>elevated temperature (92%)>anorexia (83.3%)> tenderness in right iliac fossa (62.7%)> rebound tenderness (48%) and shift to left (48%). **CONCLUSION:** Acute appendicitis is one of the most common problems encountered by a general surgeon, accounting for approximately 1% of all surgical operations. The diagnosis of acute abdominal pain is still a major problem despite the considerable improvement in history taking, clinical examination, computer-aided decision support and special investigations such as ultrasound.

KEYWORDS : Appendicitis, Alvarado Score, Appendectomy

INTRODUCTION

Acute appendicitis is one of the most common problems encountered by a general surgeon, accounting for approximately 1% of all surgical operations. Historically the appendix has been identified as a potential source of right lower quadrant pain and disease for centuries, with a scattering of case reports through the early 19th century describing abscesses and evidence of inflammation of the appendix in autopsies. As quoted by Bailey & Love, "Notwithstanding advances in modern radiographic imaging and diagnostic laboratory investigations, the diagnosis of appendicitis remains essentially clinical, requiring a mixture of observation, clinical acumen, and surgical science"¹. So much has been stressed about the various methods of diagnosis, only because the same is extremely important. Appendicitis, which if caught early and managed appropriately can be the most uneventful surgery, while the other end of the spectrum is also true, that when missed, appendicitis can turn into a disease with great morbidity and mortality. Hence, having understood the importance for early and right diagnosis, and having understood that clinical evaluation provides the best and most accurate diagnostic modality for appendicitis, many clinical scoring systems have been developed over the years². This has aided the clinician to a large extent in coming to the right diagnosis and providing early management. What began as a single scoring system, evolved into many over the years, as people constantly made modifications to the existing scoring systems based on the local demographics or by adding more factors. This brought along the next problem, of finding the single best scoring system, or the scoring system with the maximum sensitivity and diagnostic accuracy. Most of the cases require immediate removal through surgery, either open or laparoscopic appendectomy. Recent studies suggest that approximately 6% of the population will suffer from acute appendicitis in their life time. If failed to diagnose early the condition is associated with significant morbidity and mortality.

AIM AND OBJECTIVES

To analyze the clinical and epidemiological profiles of patients suffering from acute appendicitis in a tertiary care hospital in Kumaun region of Uttarakhand, India.

MATERIALS AND METHODS

Study design: A cross-sectional study.

Place of study: Dr. Susheela Tewari Government Hospital Haldwani.

Sample size: All the confirm cases of acute appendicitis in study period.

Period of study: 20 months, January 2018- Sept 2019

All confirmed cases of acute appendicitis based on clinical manifestations and hematological & radiological investigations admitted in Dr. Susheela Tiwari Government Hospital, Haldwani in the study period were included. All confirmed cases of acute appendicitis in 2 years of study period based on clinical, hematological, radiological findings, as follows:

- History taking and clinical examination of each patient carried out as per the prepared Performa.
- Complete blood count, renal function test, liver function test, electrolytes (Na⁺, K⁺, Ca⁺⁺ and total Calcium levels), coagulation profile
- X ray chest and abdomen, USG whole abdomen.

Patients were assessed in the casualty, and Alvarado score was obtained for all patients within 48 hours from the onset of the symptoms and the majority within 24 hours. If patients were thought on clinical evaluation to require appendectomy, then this was performed, regardless of the score. All the subjects included in the study remained in contact with doctor for early post-operative complications.

STATISTICAL TOOLS EMPLOYED

The statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 21.0 statistical Analysis Software. The values were represented in Number (%) and Mean±SD.

OBSERVATION AND RESULTS

This study was conducted in Dr. Susheela Tewari Government Hospital Haldwani. Majority of the cases (60.7%) were males with male to female ratio of 1.54:1. The age of the patients ranged from 11-75years, with mean age of 33.17±16.4. Majority of patients (80%) aged up to 40years. Mean age of males (36.84±17.46) was significantly higher as compared to females (p value=0.001).

Table 1: Age and gender profile of cases enrolled in the study

SN	Age Group	Male		Female		Total	
		No.	%	No.	%	No.	%
1.	11-20 Years	23	25.3	24	40.7	47	31.3
2.	21-30 Years	12	13.2	10	16.9	22	14.7
3.	31-40 Years	22	24.2	11	18.6	33	22.0
4.	41-50 Years	12	13.2	14	23.7	26	17.3
5.	51-60 Years	16	17.6	0	0.0	16	10.7
6.	61-70 Years	2	2.2	0	0.0	2	1.3
7.	71-80 Years	4	4.4	0	0.0	4	2.7
Total		91 (60.7%)		59 (%)		150 (100%)	
Mean±SD (Range)		36.64±17.46 (11-75)		27.83±13.03 (11-50)		33.17±16.40 (11-75)	

t'=3.320; p=0.001

Most common symptom among both males and females was migratory right iliac fossa pain> nausea/ vomiting> anorexia. Proportion of males was higher as compared to females for both migratory right iliac fossa pain and anorexia but the difference was not statistically significant (p value >0.05). For nausea/ vomiting the proportion of females (87.9%)>males (81.3%) with no statistical significance.

Table 2: Distribution of cases according to presence of Symptoms/ Signs and Laboratory Findings

SN	Finding	No. of patients	Percentage
1.	Migratory right Iliac fossa pain	146	97.3
2.	Nausea/ vomiting	91	60.7
3.	Anorexia	125	83.3
4.	Tenderness in right iliac fossa	94	62.7
5.	Rebound tenderness	72	48.0
6.	Elevated temperature	138	92.0
7.	Leukocytosis	148	98.7
8.	Shift to left	72	48.0

For fever/ raised temperature and rebound tenderness, proportion of males> females. For tenderness the proportion of females was higher than males, however the difference between 2 genders was not statistically significant. The difference between 2 genders was found to be significant only for fever/ raised temperature which was higher in males (95.6%) as compared to females (p value=0.043).

Table 3: Distribution of cases according to diagnostic category based on Alvarado Score

SN	Finding	No. of patients	Percentage
1.	Low probability (Score <6)	27	18.0
2.	High probability (Score 7-8)	93	62.0
3.	Definite Diagnosis (Score 9-10)	30	20.0
Mean Alvarado Score±SD (Range)		7.52±1.12 (5-9)	

100% males had leucocytosis as compared to 96.6% females but the difference was not statically significant (p value=0.07). Shift to left was seen in 46.2% males as compared to females (50.8%) with no statistical significance (p value 0.574). Range of Alvarado score varied from 5-9. Majority (62%) were in high probability> definite diagnosis (20%)> low probability (18%). Mean Alvarado score came out to be 7.52±1.12.

Table 4: Distribution of cases according to Intraoperative findings

SN	Finding	No. of patients	Percentage
1.	Normal Appendix	28	18.7
2.	Normal size appendix with mesenteric lymphadenitis	2	1.3
3.	Enlarged, inflamed edematous appendix	78	51.9
4.	Fibropurulent exudate on serosa with prominent vessels with enlarged appendix	32	21.3
5.	Inflamed edematous ulcerated appendix with prominent vessels	6	4.0
6.	Purulent exudate on serosa with gangrenous and perforated appendix	4	2.7

All 150 patients with clinical diagnosis of acute appendicitis were subjected to surgery, 28 patients (18.7%) of which had normal appendix and 2 patients (1.3%) had normal appendix with mesenteric

lymphadenitis. The gross findings in majority of cases (78, 51.9%) had enlarged inflamed appendix> fibropurulent exudates on serosa with prominent vessels and enlarged appendix (21.3%)>inflamed edematous ulcerated inflamed appendix with prominent vessels (4%)> purulent exudates on serosa with gangrenous and perforated appendix (2.7%).

DISCUSSION

Acute appendicitis (AA) is the most common cause of acute abdomen in all age groups. Accurate and prompt diagnosis in those admitted to the emergency room with the preliminary diagnosis of AA remains problematic. The aim is to make an early and accurate diagnosis before the development of complications, thereby reducing the prevalence of negative appendectomy. Studies in the literature have recommended hospital discharge for patients with AS ≤4. In the study of Khan et al when patients with AS ≤4 were divided into two as those discharged after monitoring (emergency room and surgery clinic) and those who underwent surgery, 17 of 100 patients were in the first group, and were discharged. Three of the patients returned within 48 hours and the new AS was calculated as 7; they underwent surgery and AA was detected (17%).

The sample size of our study was 150. Majority of the cases (60.7%) were males with male to female ratio of 1.54:1. The age of the patients ranged from 11-75years, with mean age of 33.17±16.4. Majority of patients (80%) aged up to 40years. Mean age of males (36.84±17.46) was significantly higher as compared to females (p value=0.001). Almost all patients had leucocytosis (98.37%)> migratory right iliac fossa pain (97.3%)>elevated temperature (92%)>anorexia (83.3%)> tenderness in right iliac fossa (62.7%)> rebound tenderness (48%) and shift to left (48%).

Most common symptom among both males and females was migratory right iliac fossa pain> nausea/ vomiting> anorexia. Proportion of males was higher as compared to females for both migratory right iliac fossa pain and anorexia but the difference was not statistically significant (p value >0.05). For nausea/ vomiting the proportion of females (87.9%)>males (81.3%) with no statistical significance. For fever/ raised temperature and rebound tenderness, proportion of males> females. For tenderness the proportion of females was higher than males, however the difference between 2 genders was not statistically significant. The difference between 2 genders was found to be significant only for fever/ raised temperature which was higher in males (95.6%) as compared to females (p value=0.043). 100% males had leucocytosis as compared to 96.6% females but the difference was not statically significant (p value=0.07). Shift to left was seen in 46.2% males as compared to females (50.8%) with no statistical significance (p value 0.574). Range of Alvarado score varied from 5-9. Majority (62%) were in high probability> definite diagnosis (20%)> low probability (18%). Mean Alvarado score came out to be 7.52±1.12.

All 150 patients with clinical diagnosis of acute appendicitis were subjected to surgery, 28 patients (18.7%) of which had normal appendix and 2 patients (1.3%) had normal appendix with mesenteric lymphadenitis. The gross findings in majority of cases (78, 51.9%) had enlarged inflamed appendix> fibropurulent exudates on serosa with prominent vessels and enlarged appendix (21.3%)>inflamed edematous ulcerated inflamed appendix with prominent vessels (4%)> purulent exudates on serosa with gangrenous and perforated appendix (2.7%). Majority of cases (n=84,56%) had acute appendicitis> gangrenous appendicitis (24%)> mesenteric lymphadenitis 1.3%, 28 patients (18.7%) had normal appendix. Incidence of negative appendicitis was 20% (30). Mean age of patient with diagnosis of acute appendicitis was 35.29±16.32, gangrenous appendicitis 29.89±16.46, mesenteric lymphadenitis 12.00, normal appendix 35.67±15.87years. there was no statistically significant correlation of mean age and final diagnosis. Except for mesenteric lymphadenitis(n=2), were both cases were females, there was no significant correlation between gender and final diagnosis. 82 patients (54.7%) were from hills and 68 patients (45.3%) were from plains. Except for mesenteric lymphadenitis for which 1 case each was from hills and plain area, all other cases were from hills. There was no significant correlation between diagnosis and location (p value=0.987).

Mean Alvarado score of normal appendix and normal appendix with mesenteric lymphadenitis was minimum. The score of enlarged inflamed edematous appendix (7.67±0.89) <purulent exudation serosa with gangrenous and perforated appendix (8±0) < fibropurulent

exudate on serosa with prominent vessels and enlarged appendix (8.03 ± 1.03) <inflamed edematous appendix with prominent vessels (8.33 ± 1.03) respectively, thus showing a significant difference among intraoperative findings.

CONCLUSION

Acute appendicitis is one of the most common problems encountered by a general surgeon, accounting for approximately 1% of all surgical operations. The diagnosis of acute abdominal pain is still a major problem despite the considerable improvement in history taking, clinical examination, computer-aided decision support and special investigations such as ultrasound.

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