



# Epidemiological and Clinical Profiles of Cases of Appendicitis Managed At a Tertiary Hospital in Nepal

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## Abstract

**Introduction:** Appendicitis is worldwide the most common surgical emergency that affects both genders and all ages.

**Methods:** This study aimed to assess the epidemiology and clinical profiles of cases of appendicitis in Nepal and compare it with the existing literature. A cross-sectional descriptive study was done on 756 patients attending Dhulikhel hospital a tertiary health care center in Dhulikhel Nepal. All the patients clinically diagnosed with appendicitis were included in this study. The required information was coded, and entered in a Microsoft Excel spreadsheet and analysis was done using SPSS version 22. The epidemiological and clinical findings were analyzed.

**Results:** Mean age of patients was  $29.13 \pm 16$  years. Out of 756 patients, 458 (60.9 %) of patients were male and 298 (39.4%) were females. The majority 42.7% of patients were from Brahmin/Chhetri ethnicity. The most common procedure for the management of appendicitis was laparoscopic appendectomy (61.24%) followed by Open appendectomy (30.6%). The mean duration of postoperative hospital stay was highest among conservative (5.2 days) and lowest among laparoscopic appendectomies (2.2 days). Most of the cases were acute inflammation (47.8%).

**Conclusion:** Appendicitis is more common among males than females and between 20- 30 years of age. The most common surgical procedure was laparoscopic appendectomy, and it has been recorded those minimum days of postoperative hospital stay was also found among laparoscopic appendectomy. Most cases are acute inflammation.

**Keywords:** Appendicitis, clinical profile, Nepal

## Introduction

Appendicitis is an inflammation of the appendix<sup>1</sup>, a most common cause of abdominal surgical treatment. Surgery is mandatory to prevent morbidity and mortality from appendicitis.<sup>2</sup>

According to the global burden of disease, globally 17.7 million cases of appendicitis has been occurred and resulting in 33400 deaths in 2019.<sup>3</sup> Approximately 10% of the population form developing world suffer from acute appendicitis during their lifetime.<sup>4</sup> In Nepal, in 2020 the number of death due to appendicitis reached 220 which is 0.14% of total death.<sup>5</sup>

Delay in the diagnosis and treatment of appendicitis can lead to a serious



outcomes like perforation and peritonitis.<sup>6</sup> Therefore, this study is designed to identify the epidemiological and clinical profiles and outcomes of appendicitis managed by open appendectomy, laparoscopic appendectomy, as well as medical management or with pigtail insertion or aspiration for appendicular lump with abscess without features of peritonitis or features of local peritonitis.

## Methods

We conducted a cross-sectional descriptive study among 756 patients who were admitted to Dhulikhel hospital from January 2018 to July 2020. Dhulikhel hospital is a tertiary health care center as well as a referral center with more than 475-bed capacity. Dhulikhel hospital is located in Dhulikhel municipality of Kavrepalanchok district which is the catchment area for most of the people from many eastern districts. We included patients of all ages, both gender and diagnosed with appendicitis.

The complaints and physical examination findings of the patients were obtained from their medical files. The Measured outcomes of the study are demographic information (age, gender, ethnicity), length of postoperative stay, and operative findings result.

**Statistical Analysis:** The data was coded and entered in a Microsoft Excel spreadsheet. Analysis was done using SPSS version 22. The variables were assessed for normality using the Kolmogorov-Smirnov test. Descriptive data analysis is deployed using simple statistics. Mean and standard deviation are calculated for continuous variables that age and length of stay. The Standard of Error of Mean (SEM) is calculated for the length of postoperative stay. Frequency and percentage were obtained for categorical variables.

## Results

Table 1 shows the demographic information of patients attending Dhulikhel hospital. Out of the total of the 756 patients studied, the age range was between 4 to 90 years. The mean age was  $29.13 \pm 16$  years. The majority 60.9 % of patients were male and 23.3% were Brahmin ethnicity.

**Table 1:** Socio-demographic information of patients

Factors	Number (n)	Percentage (%)
Age		
0- 10 years	50	6.6
10-19 years	194	25.7
20-29 years	198	26.2
30-39 years	135	17.9
40-49 years	74	9.8
50-59 years	63	8.3

Factors	Number (n)	Percentage (%)
60-69 years	25	3.3
70-79 years	15	2.0
80-89 years	1	.1
90-99 years	1	.1
Gender		
Male	458	60.6
Female	298	39.4
Ethnicity		
Brahmin/Chhetri	323	42.7
Newar	164	21.7
Others	269	35.6

**Table 2** Management and operative finding of Appendicitis

Table 2 shows the management and operative findings of appendicitis patients. Among the 756 patients, the majority 61.24% of cases manage through lap followed by 30.6% open, 6.64% conservative, and 1.56 % through conversion. The majority, 47.4% of the patients, were diagnosed with acute inflammation followed by 25% gross inflammation, 12.3% gangrenous and 6.7% perforation with lump respectively.

Management of Appendicitis	Frequency (n)	Percentage (%)
Open	232	30.6
Lap	463	61.24
Conversion	12	1.56
Conservative	49	6.48
Operative finding		
Acute inflammation	361	47.8
Gross inflammation	189	25.0
Gangrenous	93	12.3
Perforation with lump	51	6.7

**Table 3** Duration of hospital stay (mean, SD) Table 3 shows the duration of hospital stay of patients. The mean duration of hospital stay was highest among conversion cases ( $5.2 \pm 2.1$  days) followed by conservative ( $3.7 \pm 1.6$ ), open ( $2.6 \pm 1.3$ ) and lap ( $2.2 \pm 1.5$ ) respectively.

Duration of hospital stay	Mean $\pm$ SD
Open	$2.6 \pm 1.3$
Lap	$2.2 \pm 1.5$
Conversion	$5.2 \pm 2.1$
Conservative	$3.7 \pm 1.6$

## Discussion

Our study aimed to evaluate the epidemiology and clinical

profile of appendicitis managed in Dhulikhel hospital of Kavrepalanchok district Nepal. In our study, the mean age of participants was  $29.13 \pm 16$  years which is similar to the study conducted in Gujarat India where the mean age of study participants was reported to be 29.15 years.<sup>7</sup> Most of the patients in our study were from the age group 20-29 years. A similar finding was reported by the studies conducted in north India, Tamilnadu India.<sup>8,9</sup> Whereas the least number of patients were seen in the age group of more than 60 years. This finding is also similar to the study conducted in north India.<sup>8</sup>

In our study majority of patients were male. Our finding is similar to the study conducted in India<sup>7,10</sup> and west Africa<sup>11</sup> where a higher prevalence was shared by male patients. In contrast with our study, a study conducted in the high-altitude region of Nepal showed a higher prevalence among females. The gender difference in studies might be due to variations in sample size among different studies. In our study, two out of five participants were from the brahmin/chettri ethnicity. This finding is similar to a study conducted in a higher region of Nepal<sup>12</sup> where castes such as brahmin/Chhetri shared the greater percentage.

The common standard surgical procedure for the management of appendicitis includes laparoscopic appendectomy (LA) and Open appendectomy (OA).<sup>13</sup> Evidence suggests that the laparoscopic appendectomy procedure is a safe alternative to open appendectomy in patients and results in shorter hospital stays with less postoperative pain.<sup>14</sup> In our study, most of the cases have gone through laparoscopic appendectomy followed by open and least by conversion procedure. Less than two-thirds of cases have gone through a laparoscopic appendectomy. Another previous study conducted in the same setting also showed a higher percentage of laparoscopic appendectomy.<sup>15</sup> A retrospective study conducted over 4 years in a tertiary hospital of Dhulikhel showed that the trend of the patient who has gone through Laparoscopic Appendectomy was increasing by more than twofold.

The length of hospital stay not only indicates the quality of care but also affects the socio-economic consequences for patients. The shorter duration of hospital stay will decrease costs, complications, and wound infection. In our study, the mean duration of hospital stay was higher in conversion ( $5.2 \pm 2.1$  days) and the lowest was in laparoscopic appendectomy ( $2.2 \pm 1.5$  days). Laparoscopic Appendectomy has lesser quality than other procedures. This finding is similar to the other studies done in Nepal where the length of hospital stays for 2.75 days<sup>16</sup> and 2.69 days<sup>1</sup> which is less than the other procedure such as open. Similarly, this finding is also comparable with another comparative study in Nepal which showed the length of stay among patients who went through laparoscopic appendectomy is lowest than open appendectomy (4.5 vs 5.0 days).<sup>17</sup> This similar result might

be due to the choice of surgeons where most the surgeon prefer laparoscopic appendectomy because of reduced postoperative pain, cosmesis and reduced length of stay in hospital.<sup>18-20</sup> In our study, nearly half of the operative finding was acute inflammation which is the most common type of diagnosis in Nepal. This finding is supported by the study conducted in the Department of Pathology; BP Koirala Institute of Health Sciences reported a higher prevalence of acute inflammation.

Some limitations need to be considered when interpreting the result of our study. first, we conducted a study among hospital-admitted patients so there will be chances of selection bias. Second, although this is a cross-sectional descriptive study conducted at a single site so it cannot be generalized for the whole of Nepal. Behind this, our study will be useful for taking an evidence-based decision in managing complicated appendicitis.

## Conclusion

Appendicitis is a common cause of surgical emergencies in Nepal. Our study concludes that the male gender and people who have age group 20 to 30 are more prevalent appendicitis. The most common surgical procedure is laparoscopic appendectomy, and most cases are acute inflammation. The length of postoperative stay is low during laparoscopic appendectomy.

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