

## APPENDICITIS IN ACCRA: A CONTEMPORARY APPRAISAL

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### SUMMARY

Appendicitis used to be a rare disease in Accra and other parts of West Africa over five decades ago. By 1971 the incidence in Accra had increased to 2.63/10,000. From 1<sup>st</sup> June 1998 to 31<sup>st</sup> May 2000 patients presenting with appendicitis in all the major hospitals and clinics in Accra were analysed to determine the incidence of appendicitis. A prospective study of all patients admitted with acute appendicitis at the Korle Bu Teaching Hospital (KBTH) during the same period was done to determine the use of preoperative prophylactic antibiotics, complication rate and duration of hospital stay (bed occupancy) following appendicectomy. The frequency of appendicectomy for acute appendicitis relative to other general surgical emergency operations and to total operations in KBTH was also determined.

There were 1409 cases of appendicitis, 72% male and 28% female, an overall male to female ratio of 2.6:1. The yearly incidence of appendicitis in Accra was 3.18/10,000, only slightly more than three decades ago. The peak incidence was in the 20 to 24 age group. In almost all age groups it was twice as common in males as in females.

In KBTH, appendicitis constituted 31% of emergencies and 14% of general surgical operations. Ninety one percent received prophylactic antibiotics. The appendix was retrocaecal at operation in 55% of cases. The wound infection rate following appendicectomy in KBTH was 8.75% with a total complication rate of 17%. The mean duration of stay in hospital was 6 days. The 30-day mortality was 1.3%.

Acute appendicitis is the commonest general surgical emergency in Accra, being twice as common in males as in females below 60 years. Its incidence has remained relatively stable over the past 30 years.

**Keyword:** Appendicitis, appendicectomy, incidence, age, sex, complications, emergencies.

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### INTRODUCTION

Appendicitis was considered to be rare disease in the African living in the tropics five decades ago<sup>1,2</sup>. Indeed in the 1940s and 50s only 6-10 cases were seen at the Korle Bu Teaching Hospital (KBTH) in Accra<sup>3</sup>. The incidence apparently increased and in 1971 Badoe reported an incidence in Accra of 2.63/10,000<sup>4</sup>. Whilst the incidence increased in developing countries<sup>5,5</sup>, that in the developed world is reported to have decreased over the last fifty years<sup>6</sup>. Although still uncommon compared to the technologically advanced countries, appendicitis is one of the commonest surgical emergencies in developing countries, accounting for about 30% of general surgical emergency operations<sup>7</sup>.

With the passage of time, increase in population, changes in lifestyle, increased awareness of the condition and the apparent increase in numbers of appendicectomy, it has become necessary to determine the true incidence of acute appendicitis in Accra at the turn of the millennium.

The second arm of this study looked at factors relating to appendicectomy – use of prophylactic antibiotics, duration of hospital stay, morbidity and mortality rate.

### METHODS

There were three areas of data collection in this study. First, analysis of theatre and recovery ward records of all appendicectomies performed on account of appendicitis between 1<sup>st</sup> June 1998 and 31<sup>st</sup> May 2000. These included patients who had surgery for acute appendicitis as well as those who had interval appendicectomy performed after resolution of an appendix mass or appendix abscess. Records were taken from all the major hospitals in Accra, including the KBTH, Police, Military, Ridge and Trust Hospitals as well as clinics like the Nyaho, Cocoa and North Ridge Clinics. They were analyzed for total number of appendicectomies performed, and for age and sex distribution.

In the second arm of the study, a proforma was filled for patients admitted with appendicitis or found to have appendicitis at surgery at KBTH during the same 24-month period. The patients were followed from theatre until discharge. The anaesthetist recorded the time of surgery and details of antibiotics given; the surgeon wrote down the findings at operation including the position of the appendix. The date of discharge was entered on the form and crosschecked with the nurses' admission and discharge records. Any of 51 listed complications on the proforma was ticked during admission or the follow-up period.

In KBTH, an analysis of total general surgical operations, emergency general surgical operations, and appendicectomies performed on account of appendicitis was made during the period. Using theatre records, the recorded operations were scrutinized monthly and only true emergencies included in the data. The frequency of appendicectomy for appendicitis relative to other general surgical emergency operations and to total general surgical operation in KBTH was also determined. Data on the population of the city of Accra as at year 2000 was obtained from Ghana Statistical Service<sup>8</sup>.

The results of the study were compiled and analysed using Microsoft Access and Excel computer software.

**RESULTS**

**Overall Incidence**

There were 1409 appendicectomies performed for appendicitis in Accra in the 24 month period of study, with 772 (54.7%) in KBTH alone. The distribution in other hospitals and clinics is shown in Figure 1. With a population of 2,209,671 (2000 Population Census)<sup>8</sup>, the yearly incidence in Accra was 3.18/10,000.

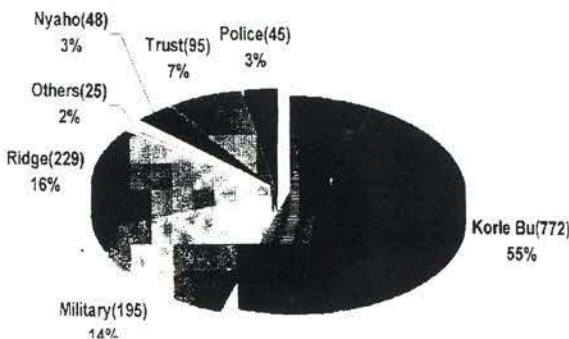


Figure 1 Appendicectomy in Accra hospitals

**Age Distribution**

The age of the patients ranged from 3 to 84 years. Table 1 shows that the peak incidence is in the 20-24 age group, followed by the 25-29 age group. Clearly the third decade had the highest incidence of appendicitis (33%). Nearly half of the patients (48%) were between the ages of 15 and 29. It is rare below the age of 5(0.4%) and above the age of 60(1.8%). This variation in age incidence was similar for both sexes.

Table 1 Age distribution of Appendicitis in Accra, 1998-2000

Age group	Male	Female	Total (%)
0-4	4	2	6(0.4)
5-9	56	24	80(5.7)
10-14	109	45	154(11.0)
15-19	142	66	208(14.8)
20-24	177	71	248(17.6)
25-29	163	55	218(15.5)
30-34	113	45	157(11.2)
35-39	96	32	128(9.1)
40-44	64	18	82(5.8)
45-49	37	8	45(3.1)
50-54	25	12	37(2.6)
55-59	12	6	18(1.3)
60-64	5	4	9(0.6)
65-69	5	3	8(0.6)
70-74	3	2	5(0.4)
75-79	1	0	1(0.1)
80-84	2	0	2(0.1)
85-89	1	0	1(0.1)
90+	0	0	0(0.0)
<b>Total</b>	<b>1016</b>	<b>393</b>	<b>1409(100.0)</b>

**Sex Distribution**

There were 1016 males and 393 females, a ratio of 2.6:1. Below the age of 15, the male (169) to female (71) ratio was 2.4:1. The male to female ratio of greater than 2 was reflected in all other age groups until after the age of 60 when the disease became uncommon.

**Frequency of Appendicectomy**

Appendicectomy was the commonest emergency general surgical operation performed at Korle Bu.

Table 2 shows that appendicectomies constituted 31% of emergency general surgical operations and 14% of total general surgical operations (elective and emergency)

**Table 2** Appendicectomies, emergency and elective general surgical operations in Korle Bu (June 1998 – May 2000)

Number of cases	5332
Number of emergencies	2452
Number of elective cases	2880
Number of appendicectomies	772
Appendicectomies/Emergencies	31.5%
Appendicectomies/Total cases	14.5%

### Perioperative findings

Of the 314 patients studied prospectively at KBTH, 286 (91%) received prophylactic antibiotics compared to 28(9%) who did not. The commonest combination used was 80mg gentamicin and 500mg metronidazole given before or at induction of anaesthesia (266 patients). Where there was complicated appendicitis the antibiotics were contained 8-hourly for variable periods post-operatively (3-5 days). Other drugs used were a cephalosporins with metronidazole, amoxicillin-clavulanic acid and ciprofloxacin.

### Position of appendix

The position of the appendix as recorded for 268 patients studied prospectively at KBTH is shown in Table 3. The retro-caecal position was the commonest (54.8%) followed by pelvic (19.4%) and para-caecal (13.8%). The pre-ileal position was found in 6.7% of cases and the post-ileal position in 5.2%.

**Table 3** Position of appendix in 268 patients

Position	Number	Percentage
Retro-caecal	147	54.9
Pelvic	52	19.4
Para-caecal	37	13.8
Pre-ileal	18	6.7
Post-ileal	14	5.2
<b>Total</b>	<b>268</b>	<b>100</b>

### Duration of admission

This was studied in 319 consecutive patients at the KBTH from June 1999 to May 2000. The mean duration of hospital stay was 6.3 days (range 3-

31 days) and the median stay was 5 days. One patient who developed an enterocutaneous fistula spent 31 days in hospital.

### Morbidity and mortality

In only 160 consecutive patients treated at KBTH was morbidity recorded. Complications occurred in 23 giving an overall complication rate of 14.3%. Wound infection was the commonest complication, occurring in 14 patients (8.7%). Wound infection was defined as the presence of pus in a wound which either discharged spontaneously or had to be released by removal of some sutures. Details of complications recorded are as shown in Table 4.

**Table 4** List of complications, 160 patients

Complication	Number
Wound infection	14
Pneumonia	2
Fistula	2
Seroma	1
Haematoma	1
Wound dehiscence	1
Hypovolaemic shock	1
Diarrhoea	1
<b>Total</b>	<b>23</b>

Ten deaths occurred among the 772 patients who presented to KBTH during the 24-month period, giving a mortality rate of 1.3%. All who died presented late with generalized peritonitis, septicaemia and circulatory failure.

### DISCUSSION

Appendicitis is a common surgical emergency all over the world, forming about 25% of emergency room visits for abdominal pain in patients younger than 60.<sup>9,10</sup> The incidence of appendicitis in Accra, like in other cities in developing countries, increased to 2.6 per 10,000 by 1971 from what was a rare disease 40-50 years ago<sup>1</sup>. This study shows that although numerically more cases of appendicitis are being seen and continue to constitute most of our surgical emergency operations (31%), the incidence in Accra has not increased much over the past 30 years. The incidence of 3.18/10,000 is based on the results of the 2000 population census<sup>8</sup> in which the population of Accra is even much less than was previously estimated.<sup>9</sup> Although the reasons are not very clear the relative stability in incidence is similar to what has been reported elsewhere, like in Norway where it has been reported

stable at 8.4/10,000 over the last ten years.<sup>6</sup> Compared to the technologically advanced countries appendicitis is still relatively uncommon in Accra as the incidence in developed countries is about six times that in Accra<sup>11</sup>.

This study shows that appendicitis is more than twice as common in males as in females. This relative sex incidence is found in all ages except in the elderly, a situation which is different from what obtained in Accra 30 years ago where the incidence was equal in both sexes until about the age of 15.<sup>4</sup> In this study the age of highest incidence was between 20 and 24 years.

At surgery, 91% of patients received prophylactic antibiotics. This is encouraging since it has been shown that antibiotic prophylaxis leads to less septic disorders of wound healing<sup>12</sup>. Wound infection is the commonest complication following appendicitis. The operation is at best a clean-contaminated one and the use of prophylactic antibiotics should keep wound infection rates at acceptable levels. At 8.75% the overall wound infection rate is comparable to that of large series in North America<sup>13</sup>. All the patients who died had overwhelming sepsis. The overall mortality rate of 1.4% is similar to what obtained in Accra in 1971 (1.6%).<sup>4</sup> and compares favourably with mortality rates from appendicitis in Port Harcourt – Nigeria (3%),<sup>14</sup> Durban – South Africa (2%),<sup>15</sup> Ethiopia (4.5%)<sup>16</sup> and Hong Kong (3%)<sup>17</sup>.

The duration of hospital stay (6.3 days) could be improved. In an extensive audit in England and Wales, mean duration of patient stay was 4.1 days after open appendicectomy.<sup>18</sup> In Accra many patients stay on for a few extra days after discharge due to financial problems. This may explain the longer duration of bed occupancy.

The number of elective general surgical operations (2880) compared to emergency general surgical operations (2452) suggests that too few elective operations are done at KBTH. This is probably due to a shortage of theatre nurses, which has resulted in fewer elective operating sessions. Too few operating sessions will lead to longer waiting lists and invariably affect the rate of acquisition of operating skills by trainee surgeons. There is therefore, the need to consider training Operating Department Assistants to salvage the ever-increasing shortage of theatre nurses, as is done in the technologically advanced countries.

The retro-caecal position was the commonest position of the inflamed appendix in this study (54.8%). This is, however, less than the 74% retro-caecal position quoted in the literature for the normal appendix. A similar study in Southampton, UK, suggested that the disparity between the number of normal and inflamed appendices in the retrocaecal position may be because the retrocaecal position is actually less prone to infection.<sup>19</sup> A study comparing the position of the inflamed appendix and the post-mortem position of the non-inflamed appendix in our population will be necessary before that inference can be made.

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