



## Auditing Appendectomy in Benue State University Teaching Hospital, Makurdi, Nigeria.

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### ABSTRACT

Appendicitis is the leading cause of surgical admission in most hospitals in Nigeria and the removed appendix, a frequent surgical specimen in most routine histopathological laboratories in Nigeria. The aim of this study is to audit the appendectomy procedures in Benue State University Teaching Hospital. Sixty-two appendices removed for acute appendix in Benue State University Teaching Hospital, Makurdi, Nigeria middle belt, over an 8-year period were analyzed. Twenty-eight (45%) were found to be normal, while 29 (46%) showed histopathological evidence of acute inflammation. There were 5 (9%) cases of unusual pathologies which include a case each of metastatic adenocarcinoma and chronic granulomatous inflammation (2% each) and 3 (5%) cases of schistosomiasis. The Negative Appendectomy Rate (NAR) was 27% in females compared with 18% in males. Adult (>16 years) represented 29% of the NAR. The overall NAR was 45%. The NAR in this study is considerable higher when compared with existing literature. In a poor resource center like Benue State University Teaching Hospital, due diligence in taking detailed history coupled with good clinical examination cannot be over emphasized. The use of a combination of Total Leukocyte Count (TCC) and C-Reactive Protein (CPR) in every patient may help in reducing NAR, though it's definitely going to be impossible to eradicate it.

**Keywords:** Appendectomy, Histopathological, Diagnosis, Negative appendectomy rate.

### INTRODUCTION

Acute appendicitis is the leading cause of surgical emergency admission in most hospitals in Nigeria, accounting for about 15-40% of all emergency surgery done in most centers in the country (Alatise & Ogunweide, 2008; Ashindoitiang, 2011). It is also a common acute surgical emergency in the UK, with over 40,000 cases every year (NHS, 2013). In the USA, the estimate life time risk of appendicitis is 8.6% and 6.7% for male and female respectively (Addiss et al., 1990). Acute appendicitis is the most common surgical emergency making appendectomy the commonest operation performed worldwide (Rosen et al., 2011; Ma et al., 2010; Gronroos, 2011).

While appendectomy is the treatment of choice for appendicitis, its diagnosis is clinical. A number of medical and surgical illnesses closely mimic appendicitis resulting in the establishing of a false diagnosis in a considerable number of patients leading to removal of normal appendix (Joshi et al., 2015). Delayed diagnosis of appendicitis, on the other hand, could lead to complications like perforated appendix, peritonitis sepsis, increased morbidity and mortality (Hale et al., 1997; Zoarets et al., 2014). Different surgeries have their own possible complications. Performing appendectomy with an erroneous diagnosis may lead to complication inherent to the surgery and patients from systemic adverse events, wound infections, hospital stay and even death (Flum & Koepsell, 2002; Bijnen et al., 2003).

There have been many studies in different parts of Nigeria outside its central middle belt to audit appendectomies. We carried out this study in order to look at the

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negative appendectomies, compare the results with published works from other parts of Nigeria and the world in general. The aim of this study is to audit the appendectomy procedures in Benue State University Teaching Hospital.

## MATERIALS AND METHODS

Data of patients, who had appendectomies during the study period from February 2012 to October 2019, was retrieved from the medical records. Study population characteristics and histopathology reports of the appendectomy specimens were retrieved from the histopathological requests forms. The primary outcome measure was appendicitis confirmed by histopathology.

Negative appendectomy was defined as a post operative appendix specimen for suspected appendicitis that was, however, microscopically normal on histopathological examination without evidence of inflammation.

Results were analyzed, recorded on the basis of sex, age and histopathological diagnosis and presented with tables.

## RESULTS

A total of 4708 specimens were reserved during the study period of February 2012 to October 2019 overall, 62 appendectomies specimens were received constituting 1.32% of the total specimens received at the histopathological laboratory for the studied period.

The mean age of the patients was 23 years (*range*, 7-67 years). Adult patients (>16 years) represented 71 % of the study population. The male sex accounted for 52% of all patients. Of the 62 removed appendixes, 29 (46%) had histopathological finding, consistent with acute appendicitis variously described as acute appendicitis, acute suppurative appendicitis and acute appendicitis with perforation. Approximately 9% of the 62 specimens were unusual pathologies other than acute appendicitis. Three of them were appendixes with eggs of schistosomiasis. One case each was for metastatic adenocarcinoma and chronic granulomatous appendicitis. The Negative Appendectomy Rate (NAR) was 45%. The female sex accounted for 27% of the negative appendectomies. Adults (>16 years) represented 29% of the negative appendectomies.

## DISCUSSION

The appendix is a frequent surgical specimen in most routine histopathological laboratories in Nigeria as acute appendicitis is a leading cause of surgical emergency admission in most hospitals in Nigeria.

Histopathological diagnosis of acute appendicitis requires neutrophil infiltration of the muscularis propria (Kumar et al., 2015). In most severe cases, a prominent neutrophil exudate generates a serosal fibrinopurulent reaction (Bijnen et al., 2003).

NAR has been recognized as a consequence of appendectomy and this study gave a NAR of 46%. This is quite high compared with other studies in Nigeria (Ojo et al., 1991; Mangete & Kombo, 2004) and outside Nigeria (Muthupei & Morwanoche, 1998; Madiba et al., 1998) with a rate that varies from 15% to 25% and 6 % to 40%, respectively (Joshi et al., 2015; Muthupei & Morwanoche, 1998; Madiba et al., 1998; Marudanayagam et al., 2006). The suggested acceptable rate of negative appendectomy is 20% (Zoarets et al., 2014; Omiyale & Adjepong, 2015). Often times, the high rates of NAR were considered as acceptable in order to avoid missing cases of appendicitis and its sequelae. The problems of negative appendectomies cannot but be emphasized. The patients undergoing surgical are exposed to all the adverse events of anesthesia and surgery, likewise the actual case of acute abdomen is missed in the garb of acute appendicitis (Joshi et al., 2015). There is a need to decrease the high NAR.

Diligence in taking a detailed history coupled with a thorough clinical examination will go a long way in decreasing the high NAR. Some authors have talked about few biochemical investigations, like raised Total Leukocyte Count (TLC) and C - reactive protein (CRP), found to be associated with acute appendicitis. Total leukocyte count may be normal in acute appendicitis and when used alone also is not a consistent predictor of appendicitis (Howell et al., 2010; Merlin et al., 2010). An India work found TLC to be raised in only 59.3% of their patients for appendectomy (Joshi et al., 2015). Others have found a strong correlation between appendicitis and CRP, but the combination of TLC and CRP correlates better than any one of these investigation alone (Howell et al., 2010; Ashindoitiang, 2011). A documented decline in NAR has been noticed with increased use of imaging especially computed tomography and laparoscopy as diagnostic tool for appendicitis (Mariadason et al., 2012). Although a definitive causal relationship has not been established, low NAR has been attributed to the use of computed tomography by some works (Webb, 2011; Raja et al., 2010). Our centre is in a low resource centre where basic laboratory investigations are often a luxury for the patients. Except for few centers in the federal and state capitals in Nigeria, computed tomography is not readily available and, when they are, the cost is often high above what the average Nigerians can afford.

Though males are affected slightly more often than females in acute appendicitis (Kumar et al., 2015), studies have shown that the highest incidence of NAR occurs in females compared to males (Lameris et al., 2009; Coursey et al., 2010).

There are many gynecological conditions that could present like acute appendicitis. These include pelvic inflammatory diseases, ovarian cysts, endometriosis and pelvic adhesions, amongst others.

The incidence of unusual pathologies in our study is high (9%) when compared with other studies (*Chamisa, 2009; Omiyale & Adjepong, 2015*). In this study, unusual pathologies include metastatic adenocarcinoma, schistosomiasis and chronic granulomatous appendicitis. A Nigerian work found intraluminal ova of parasites with phlegmonous, eosinophilic infiltration of the appendix and *Toxoplasma* appendicitis as part of their unusual pathologies (*Ojo et al., 1991*). Other documented unusual pathologies found on histological examination of resected appendix include lymphomas, neurofibromas and actinomycosis (*Swank et al., 2011*).

## CONCLUSION

Our NAR is considerable higher when compared with that of existing literature. In a low resource centre like ours, diagnosis of appendicitis is clinical and based on the combination of right lower quadrant abdominal pains, signs of peritoneal irritation and a raised total white cell count with neutrophils. Due diligence in taking detailed history coupled with good clinical examination cannot be over emphasized. The use of combination of TLC and CRP in every patient may help in reducing NAR, though it's definitely going to be impossible to eradicate it.

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