PATTERN OF PRESENTATION, AND TREATMENT OUTCOMES OF INTRA-ABDOMINAL ABSCESSES, IN A SUBURBAN HOSPITAL IN BAYELSA STATE NIGERIA

ABSTRACT

Aim: To determine the pattern of presentation, etiology, clinical features, and treatment outcome of intra-abdominal abscess in sub-urban Bayelsa Nigeria and suggest possible preventive measures.

Place and duration of study: This study was carried out in the Niger Delta University Teaching Hospital Okolobiri Bayelsa State Nigeria from February 2011 to March 2016.

Methodology: Thirty (30) patients with intra-abdominal abscesses seen at the Niger Delta University Teaching Hospital Okolobiri Bayelsa State Nigeria within the periods of study, having fulfilled inclusion criteria had their data extracted from case notes and retrospectively analyzed for pattern of presentation, etiology, clinical features, and treatment outcome. Simple descriptive statistics and tables were used to present results.

Result: There were 18 males and 12 females with mean age of 35, S^2 = 514.28, SD= 1.01; and the highest incidence was in the age group of 21-40years, affecting all occupational groups. Forty percent (40%) presented to the hospital after two weeks of onset of illness, and most common cause of intra-abdominal abscess was from ruptured appendix 13 [43.33%].

Conclusion: Outcome in treatment of intra-abdominal abscess continue to be influenced by risk factors which we found from our studies to be late presentation to hospital, delay in diagnosis, and abdominal massage. Urgent public health campaign will help reduce the incidence of visceral perforation and spread of infected materials in peritoneal cavity.

Keywords: Delay, Perforation, Abscess, Massage, Traditional

INTRODUCTION.

Intra-abdominal abscesses are collections of purulent materials, necrotic debris, bacteria, and inflammatory cells in the normally sterile peritoneal cavity. Intra-abdominal abscess continues to be an important and serious problem in surgical practice. It constitutes a major cause of morbidity and financial expenditure in hospitals around the world, and a significant cause of surgical emergency. [1]

Various reports by Ariel et al [2] and Alteimer et al [3], had noted that the mortality rate in cases of untreated intra-abdominal abscesses may be as high as 80% to 100%, therefore early and correct diagnosis as well as immediate, rational and effective therapy is required to reduce the mortality rate. In their report, DeFrances et al [1], had noted that complicated intra-abdominal infection is a common problem worldwide, with appendicitis affecting over 300,000 patients per year in the US and consuming over one million hospital days. [1]

In a study conducted by Wu et al [4], the incidence of intra-abdominal abscesses following gastrectomy manifesting as complex fluid collection on computed Tomography [CT], abdominal pains, fever, and leucocytosis ranges from 0.6% to 17%. In another study by James G et al [5], working on re-operation for intra-abdominal sepsis, the incidence of intra-abdominal abscess following re-operation was as high as 54%.

Solomkin JS [6] had reported that Intra-abdominal abscess usually arise from events leading to the perforation of viscus, for example, perforated appendix, small bowel, colon, duodenum, stomach or the gall bladder. Wu et al [4], had noted that intra-abdominal abscess is one of the commonest complications following abdominal surgeries especially gastrectomies. Intra-abdominal abscess may follow abdominal trauma or penetrating abdominal injuries. [6]

The value of a range of symptoms, signs and physical findings in the diagnostic work-up for intra-abdominal infection has been mostly fully studied in relation to acute appendicitis. [7]. In the same study, Silen et al [7], had noted that patients with intra-abdominal abscesses often presents with abdominal pains, fever, abdominal distension, diarrhea, loss of appetite, nausea, vomiting, cough, and loss of weight. There is often tenderness, reduced bowel sound, tachypnea and tachycardia. [7]

In the immediate post operative period, the clinical diagnosis of intra-abdominal abscesses may be difficult because post-operative analgesics and incisional pain frequently mask abdominal findings. In addition, antibiotic administered may mask abdominal tenderness, fever and leucocytosis.

In developing countries like Nigeria, there is often a delay in initiating treatment because of the obscure nature of many conditions resulting in abscess formation, which can make diagnosis and localization difficult. The delay in diagnosis and initiation of treatment can lead to increase morbidity and mortality in patients with intra-abdominal abscess, and may be a significant source of economic drain both for the patient and the hospital. [8]

However, within the last decades, sonography [Abdominal ultrasound], computer tomography scan [CT], and plain X-ray of the abdomen, and ^{99m}TC sulfur colloid liver and Gullium abdominal scintigraphy have allowed earlier detection of intra-abdominal abscess and are the imaging modality of choice in making a diagnosis of intra-abdominal abscess. [9,10.]

Appropriate management of intra-abdominal infections and abscesses in advanced world has evolved considerably, because of the advances in supportive intensive care, diagnostic

imaging, minimally invasive intervention and improvement and availability of adequate antimicrobial therapy. [9]

However, in developing countries like ours, where some of these facilities are not available, clinical diagnosis assisted by ultrasonography and open surgical drainage combined with debridement, antibiotics therapy, and analgesics is the treatment of choice for patient with intra-abdominal abscesses. The repair or the resection of perforated viscus and traumatized tissues and the institution of other supportive measure may be carried out.

Although, the morbidity and mortality of intra-abdominal abscesses have decreased with the introduction of antibiotics, the overall incidence of post operative abscess formation has not changed. [3]. Failure to recognize or control septic abdominal conditions results in such syndromes as multiple system organ failure [MOF] which have a mortality rate approaching 100%[11,12]. However, early surgical diagnosis, drainage combined with debridement, and appropriate anti-microbial therapy reduces the mortality to between 20-30%. [2]

As a result of poverty and ignorance, patients with acute abdominal conditions often seek medical advice from traditional health attendants who may massage the abdomen and administer medications. There is dearth of literature in this environment on the pattern of presentation of intra-abdominal abscess, its morbidity and treatment outcome.

Patients and Methods.

This is a retrospective study of all patients with intra-abdominal abscesses seen and managed at the Niger Delta University teaching Hospital over a five year period, from February 2011 to March 2016. Three patients, who had penetrating abdominal injuries and died on arrival, and three who discharged their selves against medical advice, and all patients who had Intra-hepatic, spleenic, pancreatic and retroperitoneal abscesses were excluded from the study. Case notes of all the patients were collected from the wards, theater, accident and emergency department and were analyzed for age, sex, occupation, clinical presentation, etiology, location of abscess [imaging/intra-operative finding], and outcome of management. Data were analyzed and simple descriptive statistics and tables were used to present results.

Permission for this study was obtained from the Ethical Committee of the Niger Delta University Teaching Hospital

Limitations of the study.

We were unable to perform anaerobic cultures, and the sample size is small.

Results.

Table-1. Age and sex distribution.

Age.	**Male.**	**Female**	**F (%)**
0-10	1	0	1(3.33)
11-20	3	1	4(13.33)
21-30	5	3	8(26.67)
31-40	3	4	7(23.33)
41-50	2	2	4(13.33)
51-60	2	1	3(10.00)
61-70	1	1	2(6.67)
>70	1	0	1(3.33)
Total.	**18**	**12**	**30(100)**

There were 18 males and 12 female who had intra-abdominal abscesses during the period of study. Their age raged between 5 years to 72 years, with a mean age of 35 years, (SD=1.01,S^2 = 514.28). There were more males than in females, and male to female ratio was 1.5: 1. The youngest was a five year old child who had intra-abdominal abscess following ruptured appendix and massaging of the abdomen, while the eldest was a 72 year old with perforated gastric ulcer and developed intra-abdominal abscesses. The highest incidence of intra-abdominal abscesses occurred between the ages of 21-40 years.

Table-2 Occupation.

Occupation.	**Male**	**Female**	**F (%)**
Students	8	5	13(43.33)
Unemployed.	4	2	6(20.00)
Civil servants	4	1	5(16.67)
Business.	1	2	3(10.00)
Farmer**.**	**1**	**2**	3(10.00)
Total.	**18**	**12**	**(100.00)**

Students 13 [43.33%] and the unemployed 6 [20%] had the highest incidence of Intra-abdominal abscesses.

Table-3 Onset of symptoms and time of presentation at the hospital.

Onset of symptoms before presentation [days]	Male	Female	F (%)
1-3	0	0	0(0.00)
4-6	1	0	1(3.33)
7-9	1	1	2(6.67)
10-12	4	3	7(23.33)
13-15	4	4	8(26.67)
>15	8	4	12(40.00)
Total.	**18**	**12**	**30(100.00)**

No patient who had intra-abdominal abscess presented to the clinic within the first three days of the onset of symptoms. Majority 40% presented over two week after the onset of symptoms. Only a patient 3.33% presented to the hospital within the first 5-8days of presentation of symptoms.

Table-4 Etiology.

Etiology	F(%)
Perforated appendix	13(43.33)
Perforated gastric ulcers	7(23.33)
Post-operative	5(16.67)
Trauma to abdomen	2(6.67)
Perforated typhoid	2(6.67)
Pelvic inflammatory disease	1(3.33)
Total.	**30(100)**

Most patients with ruptured appendix 13 [43.33%] developed intra-abdominal abscesses, this is followed by 7 [23.33%] patients who had perforated gastric ulcers and 5 [16.67%] who developed intra-abdominal abscess post-operatively. Two patients [6.67%] with penetrating trauma to the abdomen and perforated typhoid enteritis developed intra-abdominal abscess. Pelvic inflammatory disease was the least course of intra-abdominal abscess.

133 **Table-5 Clinical presentation**.

Presentation/parameter	F (%).
Fever (38-40° C).	30(100.00)
Abdominal pains.	30(100.00)
Nausea/vomiting	23(76.67)
Abdominal distension.	18(60.00)
Tenderness.	27(90.00)
Cough.	8(26.67)
Loss of weight.	8(26.67)
Ileus (absent bowel sound)	22(66.67)
Tachycardia.	30(100.00)
Leucocytosis.	30(100.00)

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135 Abdominal pain, fever, nausea and vomiting, was present in all the patients with intra-
136 abdominal abscess, while cough and loss of weight was present in the 8 [26.67%] patients,
137 six [20%] (table-6) of whom had sub-phrenic abscess. In addition, eighteen [60%] of the
138 patients had mild abdominal distension following intra-abdominal abscess while 22 [66.67%]
139 patients had prolonged ileus. All the patients had leucocytosis.

140 **Table-6 Ultrasound scan/Intra-operative finding/ anatomic location of abscess**

Location	F (%)
Intra-loop abscess	13(43.33)
Complex abscess./inter-loop, sub-hepatic, pelvic.	9(30.00)
Sub-hepatic abscess	6(20.00)
Pelvic abscess	6(20.00)
Sub-phrenic	6(20.00)

141

142 There were 30 patients with 40 abscess locations. Intra-loop abscesses 13 [43.33%]
143 following rupture viscus was the commonest site where abscesses were located in the
144 abdomen. This was followed by 9 [30%] patients who had had a complex abscess involving
145 the sub-phrenic, sub-hepatic, intra-loop and pelvic abscesses. Six patients [20%] had pelvic
146 and sub-hepatic abscesses each.

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149 **Table-7 Bacteriology**

Treatment given.	F(%)
Sterile specimen.	24
Candida spp	6
Aerobes	No growth
Anaerobes	Not done
Sensitivity	**Not done.**

150

151 **Table-8 Treatment received.**

Treatment given.	F(%)
Drainage of abscess	30(100.00)
Debridement.	30(100.00)
Antibiotics.	30(100.00)
Analgesics	30(100.00)
Blood transfusion.	10(40.00)
Adjunct fluid therapy.	30(100.00)
Abdominal lavage	30(100.00)

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153 Incision and drainage of pus within the peritoneal cavity, abdominal lavage, debridement,
154 adjunct empirical antibiotics therapy, and analgesics were the commonest treatment offered
155 patients. In addition, the patients had intravenous fluid therapy with good results. Ten
156 patients had blood transfusion.

157 **Table 9 Outcome following the treatment of intra-abdominal abscesses.**

Complications.	F (%)
Surgical site infection.	19(63.33)
Chest infection.	9(30.00)
Enterocutaneous fistula.	3(10.00)
Incisional hernia.	3(10.00)
Bleeding. [post operative]	8(26.67)
Recurrent abscess.	5(16.67)
Overwhelming sepsis.	12(40.00)
Renal failure.	4(13.33)

Burst abdomen.	5(16.67)
Death..	12(40.00)

The most frequent complication noted was surgical site infection [63.33%], this was followed by overwhelming sepsis [12] and bleeding post-operative and recurrent abscess5 [16.67%].There were twelve [40%] deaths following overwhelming sepsis and multiple organ failures. Five [16.67%] had to be re-operated following non-resolution of the abscess and high output fecal fistula. Five patients [16.67%] had burst abdomen after surgical drainage of the abscess.

DISCUSSION

Intra-abdominal abscess continue to be an important and serious problem in surgical practice. In developing countries, there is often a delay in initiating treatment because of the obscure nature of many conditions resulting in abscess formation, which can make diagnosis and localization difficult. As a result of the delay in making a diagnosis and initiating treatment there is increase in morbidity and mortality. The economic impact of delay in treatment is high, and it constitutes a drain for both patient and the hospital.

Several reports [6,13] have illustrated the etiologic agents involved in causing Intra-abdominal abscesses. Perforated viscera for example, the appendix, colon, small bowel, stomach, the duodenum, or the gall bladder have been implicated in causing intra-abdominal abscesses. Other workers [4,6,14] have also noted that Intra-abdominal abscesses can develop as a complication of post-operative abdominal surgeries. [6] In our study, majority of the patients had perforated appendix [43.33%] followed by perforated gastric ulcers. [23.33%]. Our findings seemed to agree with the result of Solomkin et al [6] who reported perforated viscus as being the major cause of intra-abdominal abscess. Lo et al [14], in their study on the predisposing factors for intra-abdominal abscesses after gastrectomy, noted that increasing age, prolonged operation time and combined organ resection are risk factors in causing intra-abdominal abscess. Lo et al [14], had worked on predisposing factors to intra-abdominal abscesses post gastrectomy. But in our study, the main risk factors are delay in presentation at hospital, making diagnosis, massaging of the abdomen, and inflamed appendix. Although, the risk factors in our study contrast those of Lo et al [14] study design and selection criteria may account for the differences in the etiologic conditions.

As a result of the local illness-health belief, poverty, ignorance and local practice, patients with abdominal pain, who may have inflamed appendix visit traditional massage as first responders. The pressure from the massaging may have led to the rupture and consequent

spread of intestinal contents into the peritoneal cavity that may have resulted in abscess formation. This in part may explain the high incidence of intra-abdominal abscesses following appendicitis and perforated gastric ulcers in our study.

Fry DE et al [15] in their study on the determinant of death in patients with intra-abdominal abscesses, noted that the most frequent site of abscess were the sub-phrenic and pelvic regions, while James G et al [5] in their study noted that the commonest location of intra-abdominal abscess were the intra-loop followed by the gutter and lesser sac. The work of James at al [5], is similar to our study where most of the abscesses were intra-loop, but slightly different from their report, from the fact that the second commonest site of the abscesses in our study was the complex abscess where the entire abdomen was involved. Again, the effect of massaging the abdomen may have accounted for the high number of complex abscesses in our series, and may have accounted for the differences in the anatomic location of abscesses in our study.

In the same study, Fry et al [15] noted that trauma to the abdomen accounted for 40% of cases of intra-abdominal abscess, while technical error and gastro-intestinal perforation resulted in abscesses in 17.5% and 15% respectively. In contrast, our study revealed that gastro-intestinal perforation accounted for the highest [63.33%] number of cases. Our study was also similar to those of Gorbach SL [13] who documented perforated viscus as being the main causative agents causing intra-abdominal abscess.

Previous reports [17] have shown that mixed microbial agents from the normal gastro-intestinal flora are responsible for intra-abdominal abscess. [17]. Although, Bacteriodes fragilis is among the least prevalent anaerobic species in the intestinal tract, it is responsible for the majority of all clinical cases of anaerobic sepsis and intra-abdominal infections [13] .In our series, all the cultures were sterile of bacteria, but few [6 [20%]] grew candida species. The high incidence of sterile specimens [80%] in our study could be due to inability of our laboratory to culture anaerobes, and the fact that most patients presented late to the clinic and may have had antimicrobial therapy before the specimen were collected and cultured. This is not surprising since most traditional health care attendants administer various forms of antibiotic blindly to patients before referring them to hospital for proper management.

Sub-phrenic abscesses may arise as a complication of perforation of the viscus especially the stomach and the duodenum, [13] and the mortality is as high as 30% in some series. [18]. In our study, eleven patients [36.67%] that died following intra-abdominal abscesses had complex abscesses which included sub-phrenic abscess. Our figure is similar but slightly higher than those of Bonfils-Robert et al [18] who reported a mortality rate of 30% in their

series. The number of patients in our study and Inclusion criteria and etiologic differences may have accounted for the differences in mortality rates in both studies.

Fecal fistula is one of the most life threatening conditions associated with intra-abdominal abscesses. The rate of its occurrence has been reported to be around 12% with very high morbidity. According to Mock et al [19] its morbidity and mortality increases as age advances possibly due to the effect of co-morbidity and poor immunity. These reports seem to agree with our findings. Out of the twelve patients who died following intra-abdominal abscesses six were diabetics and three were hypertensive, three of them had fecal fistula. One was a 72 year old hypertensive who had perforated gastric ulcer disease and presented late to the hospital following repeated abdominal massage. [She presented late at the hospital, developed intra-abdomen abscesses and refused blood transfusion for religious reasons.] Delays in presentation at the hospital and in making the diagnosis, loss of physiologic reserve together with concomitant systemic illness may be responsible for the worse outcome in the elderly as was demonstrated in other studies. [6]

The decision to re-operate is frequently challenging especially when faced with a critically ill patient with nonspecific signs and symptoms of partially treated sepsis. This was noted by Schein at al [20] in their study on planned re-operation and management of critically ill-patients with intra-abdominal sepsis. We agree with these reports, for most of our patients were critically ill too. These coupled with the high level of poverty with patients' inability to provide basic items needed for re-operation, and the fact that the intensive care unit lacked some basic life supporting equipment created very difficult and challenging constraints for the surgeon.

The principles of surgical microbial therapy have long been established over the years, and the selection of antibiotics for treatment is based on its activity against anticipated bacteria at the specific surgical site.[21] In our study, all the patients had empirical antibiotic therapy, abdominal lavage and surgical drainage of the abscesses. Our study showed a mortality rate of 36.67%. The high mortality rate despite the use of empirical antibiotics was attributed to overwhelming sepsis and multiple organ failure. Although the presence of uncontrolled diabetes and other co-morbid conditions were noted, however, proper timing, and adequate use of antibiotics doses are important. Inadequate timing and prolonged use of antibiotics may be associated with emergence of resistance bacteria strains which may result in treatment failure in patients with intra-abdominal abscess as was noted by Harbarth et al [22].

Saina et al [23] , reviewed 100 consecutive patients with intra-abdominal abscesses. The mortality rate in their series was 12%. In another study, James G [5], while working in re-operation in patient with abdominal sepsis, had a mortality rate of 32%. In our series, our

mortality rate was 36.67%. Our figure 36.67% was higher than those of Saina et al [23] but similar to those of James G et al [5] The low incidence in Saina et al [23] series was attributed to the early diagnosis using modern imaging technology and the lesser incidence of multiple organ failure in their series. In our center, like in most places in the third world, imaging technique like CT scan is not readily available, and the ultra-sonography where available their use are epileptic and often hindered by inadequate power supply. As a result, the physicians rely mainly on clinical evidence of spiking temperature, presence of abdominal distension, leucocytosis and other physiologic indices to make diagnosis. This may have accounted for the high morbidity and mortality documented our study.

Percutaneous drainage had been widely used and accepted as the preferred treatment of intra-abdominal and pelvis abscesses in developed world. Golfier R et al. [23]. Percutaneous drainage of abscesses is technology dependent but patient friendly. Although this true, in our environment the practice is still in its infancy and has not gained wide usage/acceptance as a result of poverty, lack of equipment and adequate man power training and inadequate political will.

As was noted by Solmkin JS et al [6], the incidence of death following intra-abdominal abscess is correlated with the severity of the underlying cause, a delayed diagnosis and initiating intervention more than 24 hours, inadequate drainage and unsuspected of foci of infection in the peritoneal cavity or elsewhere, advanced age, poor nutritional status, presence of malignancy, and the inability to achieve adequate debridement. [6]. Our study highlighted these facts for most of patients [60%] who died presented late, were very ill, elderly, had abdominal massage, delayed diagnosis, and commencement of treatment intervention. There is therefore, urgent need for massive health campaign and education of the public on the benefits of early presention to the hospital and the dangers of massage following abdominal pain or discomfort. This will help to decrease the incidence of perforation of inflamed intra-abdominal viscus and spread of infected material in the peritoneal cavity. There is also the need for the creation of a central/regional intensive care unit equipped with modern equipment to cater for patients who are critically ill. These will help reduce the morbidity and mortality associated with intra-abdominal abscess.

CONCLUSION

Complicated intra-abdominal infections are problems in clinical practice and consume substantial hospital resources. Outcome is influenced by early diagnosis, appropriate surgical intervention and the use of effective anti-microbial therapy. There is need to educate the public on the danger of presenting late to hospital and abdominal massage.

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