

Prevalence, Aetiology, and Clinical Profile of Acute Abdomen in Pregnancy in Southwest Cameroon: A 5-Year Retrospective Study

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Abstract

Background: Acute abdomen is one of the commonest reasons for presentation at the emergency department. The physiologic changes of pregnancy increase the chances of developing acute abdomen. The global incidence of acute abdomen in pregnancy range from 1 in 500 to 1 in 635 pregnant women. In 2018, a study in Azerbaijan reported a prevalence of 25%. However, to the best of our knowledge, very few studies have been carried out on this subject in Cameroon. **Objectives:** To determine the prevalence, assess the aetiologies, and review clinical profile of acute abdomen in pregnancy in the Southwest Cameroon. **Methods:** We conducted a 5-year retrospective study at the Obst/Gyn and Surgical units of Kumba, Buea, and Limbe Regional Hospitals. We included all files of pregnant women that were admitted for acute abdomen within the study period (1st Jan 2017 to 31st Dec 2021). Data was collected using a structured checklist adapted from previous studies. Descriptive statistics and statistical testing was done using SPSS version 25.0. Chi-square was used to compare categorical variables. $p < 0.05$ was considered significant. **Results:** Over 14,106 pregnant women were admitted to the aforementioned hospitals within the study period. 335 (2.4%) met our inclusion criteria. The patients' age ranged from 17 to 43 years. The mean age was 27 years. Acute abdomen was more frequent (65%) in the first trimester. Ectopic pregnancy was the commonest obstetric aetiology while appendicitis was the commonest non obstetric surgical aetiology. Abdominal pain and tenderness were

the most common presentation. **Conclusion:** The prevalence of acute abdomen in pregnancy in the Southwest Cameroon is 10 times higher than the global prevalence. Our study also confirmed the numerous aetiologies and varied clinical presentations of acute abdomen in pregnancy. Hence a wake-up call for primary care physicians.

Keywords

Acute Abdomen, Pregnancy, Southwest Cameroon

1. Introduction

Acute abdomen refers to severe abdominal pain of unknown aetiology, lasting less than 24 hours duration, and which demands immediate medical attention [1]. Globally, it accounts for 10% of all visits to the emergency department [2]. Pregnancy increases the chances of developing acute abdomen [3] [4]. The global incidence of acute abdomen in pregnancy is 1 in 500 to 1 in 600 pregnant women [5]. In a study in Azerbaijan in 2018, the prevalence was 25% [6]. In Sub-Saharan Africa, studies have been conducted on the causes of acute abdomen in pregnancy and these include medical causes (gastroenteritis, gastro-oesophageal reflux disease, urinary tract infection, etc.), surgical causes (acute appendicitis, acute cholecystitis, intestinal obstruction, etc.), as well as gynaeco-obstetrical causes (ectopic pregnancy, uterine rupture, ovarian cyst, etc.) [7] [8] [9]. However there are little or no studies on the epidemiological profile.

The numerous causes and varied/altered clinical presentation makes diagnosis very difficult [8]. Delayed/missed diagnosis and hesitancy to operate during pregnancy increase maternal morbidity and poor foetal outcome [10]. The aetiologic diagnosis is uncertain or missed in 30% of patients [11]. Delayed/missed diagnosis is associated with 50% maternal and 100% perinatal mortality [10]. It is well established that missed/delayed diagnosis is fatal to both the mother and the foetus [10]. To curb the morbidity and mortality associated with delayed/missed diagnosis, knowledge of the frequency, aetiologies, and clinical presentation of acute abdomen in pregnancy is needed to aid physicians to make prompt and accurate diagnoses. In Cameroon, there are little or no published data on the epidemiological and clinical profile of acute abdomen in pregnancy. Therefore, this study aimed to determine the prevalence, ascertain the aetiologies, and assess the clinical presentation of acute abdomen in pregnancy at 3 major centers in the Southwest Cameroon.

2. Patients and Methods

This study is a preliminary analysis of retrospective data collected on pregnant women admitted to the three referral hospitals (Kumba, Buea and Limbe Regional Hospitals) in southwest Cameroon within the last five years (1st January 2017 to

31st December 2021). Kumba, Buea and Limbe Regional Hospitals are regional referral centers with a mixed urban/rural catchment population in Southwest Cameroon. Although being teaching hospitals with lecturers and interns, at least one doctor is on duty at all times and consultant surgeons and gynecologist are called upon to direct management and carryout emergency surgeries if required.

Between January 2017 to December 2021, all pregnant women who were admitted to emergency department, Obst/Gyn and surgical wards of the hospitals mentioned with history of abdominal pain were included. Data was collected with a pre-tested data entry form and included the age of patient, gestational age, symptoms, signs, ultrasound findings, diagnosis, treatment (medical or surgical), treatment outcome. The data was collected using a structured checklist and entered into an excel spreadsheet and exported to the statistical package for social sciences (SPSS) version 25. Descriptive statistics and statistical testing was carried out. We presented continuous variables as mean \pm SD, and categorical variables as absolute values and percentages. A Chi-square test was used to ascertain the association between categorical variables. Statistical significance was considered at $p < 0.05$.

3. Results

Out of the Fourteen thousand one hundred and six (14106) pregnant women admitted in study area, a total of 335 pregnant women with acute abdomen were collected, giving a prevalence of 2.4%. Most participants were in their twenties (**Table 1**). The youngest was 17 years old while the oldest was 43 years. The mean age of the study was 28 years.

Concerning gravidity, 27.5% of patients were primigravida (first pregnancy). Most patients (62.7%) were multi-gravida (2 - 4 pregnancies). And very few (9.7%) were grand multi-gravida (5 or more pregnancies).

Most cases (65.4%) of acute abdomen in pregnancy were observed during the first trimester of pregnancy. 29% and 5.6% occurred in the 2nd and 3rd.

The aetiology of acute abdomen in pregnancy can be divided into obstetric and non-obstetric causes (**Table 2**).

Gynaeco-Obstetrics aetiologies of acute abdomen in pregnancy comprise a vast majority (87.5) of causes. Medical and surgical aetiologies make up 10.5 and 2.0% respectively (**Figure 1**).

The most consistent symptom and signs were abdominal pain (100%) and abdominal tenderness (98.5%) respectively. 21% had nausea/vomiting, 15% had a fever, and 14% presented with anorexia. 14% of patients had signs of peritonism (rebound, guarding, and rigidity) (**Table 3**).

Bivariate analysis of age group and aetiology revealed an association between age group and an ectopic pregnancy that was statistically significant ($p < 0.05$) (**Table 4**).

We found an association between the trimester (gestational age) of pregnancy and the aetiology of acute abdomen (**Table 5**).

Table 1. Age group distribution.

Age Group	Frequency (n)	Percentage (%)
<20	30	9
20 - 30	193	57.6
>31	112	33.4
Total	335	100.0

Table 2. Frequency distribution of aetiology.

Aetiology	Frequency (n)	Percentage (%)
OBSTETRIC		
Ectopic pregnancy	135	40.3
Miscarriage	129	38.5
Abruptio placentae	6	1.8
Uterine rupture	3	0.9
NON OBSTETRIC		
Urinary tract infection	31	9.3
Symptomatic myoma	10	3.0
Pelvic Inflammatory Disease	6	1.8
Appendicitis	4	1.2
Gastroenteritis	4	1.2
Ovarian cyst	4	1.2
Cholecystitis	2	0.6
Intestinal obstruction	1	0.3
Total	335	100.0

Table 3. Clinical presentation.

Signs and symptoms	Frequency (n)	Percentage (%)
Abdominal pain	335	100.0
Nausea/vomiting	70	20.9
Fever	50	14.9
Anorexia	46	13.7
Pervaginal bleeding	218	65.1
Abdominal tenderness	330	98.5
Peritonism (rebound, guarding/rigidity)	46	13.7

Table 4. Relationship between age group and aetiology.

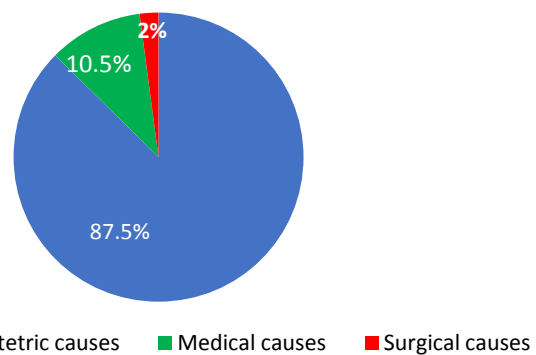
Aetiology	Level	Age-Group			Chi-square	p-value
		<20	21 - 30	>30		
Ectopic pregnancy	NO	20 (66.7)	128 (66.3)	52 (46.4)	12.32	0.02
	YES	10 (33.3)	65 (33.7)	60 (53.6)		

Continued

Miscarriage	NO	15 (50.0)	112 (58.0)	79 (70.5)	6.52	0.038
	YES	15 (50.0)	81 (42.0)	33 (29.5)		
UTI	NO	28 (93.3)	171 (88.6)	105 (93.8)	2.5	0.286
	YES	2 (6.7)	22 (11.4)	7 (6.3)		
Abruptio placentae	NO	30 (100.0)	189 (97.9)	110 (98.2)	0.63	0.728
	YES	0 (0.0)	4 (2.1)	2 (1.8)		
Uterine rupture	NO	30 (100.0)	190 (98.4)	112 (100)	2.22	0.328
	YES	0 (0.0)	3 (1.6)	0 (0.0)		
Acute Appendicitis	NO	29 (96.7)	190 (98.4)	112 (100.0)	2.73	0.255
	YES	1 (3.3)	3 (1.6)	0 (0.0)		

Table 5. Relationship between trimester and aetiology.

Aetiology	Level	Trimester of pregnancy			Chi-square	p-value
		1 st	2 nd	3 rd		
Ectopic pregnancy	NO	87 (39.7)	94 (96.9)	94 (96.9)	104.96	0
	YES	132 (60.3)	3 (3.1)	0 (0.0)		
Miscarriage	NO	146 (66.7)	41 (42.3)	19 (100.0)	29.51	0
	YES	73 (33.3)	56 (57.6)	0 (0.0)		
UTI	NO	212 (96.8)	81 (83.5)	11 (57.9)	40.04	0
	YES	7 (3.2)	16 (16.5)	8 (42.1)		
Uterine Myoma	NO	218 (99.5)	89 (91.8)	18 (94.7)	14.45	0.001
	YES	1 (0.5)	8 (8.2)	1 (5.3)		
Abruptio placentae	NO	219 (100.0)	96 (99.0)	14 (77.7)	96.28	0
	YES	0 (0.0)	1 (1.0)	5 (26.3)		
Uterine rupture	NO	219 (100.0)	97 (100.0)	16 (84.2)	50.34	0
	YES	0 (0.0)	0 (0.0)	3 (15.8)		
PID	NO	215 (98.2)	96 (99.0)	18 (94.7)	1.61	0.44
	YES	4 (1.8)	1 (1.0)	1 (5.3)		
Appendicitis	NO	219 (100.0)	93 (95.9)	19 (100.0)	9.93	0.007
	YES	0 (0.0)	4 (4.1)	0 (0.0)		

**Figure 1.** Aetiology of acute abdomen in pregnancy.

4. Discussions

We reviewed fourteen thousand one hundred and six files; three hundred and thirty-five files met our inclusion criteria, giving a prevalence of 2.4%. This finding was similar to the global prevalence of 0.2% [5]. However, it was far lower than the 25% reported by Ojaghihaghi *et al.* in Azerbaijan province [6]. This disparity could be attributed to the difference in study settings. We conducted our study at the Obstetric ward which receives both outpatients and patients from the emergency department. The study by Ojaghihaghi *et al.* was conducted at an Emergency Department that receives only hot cases like acute abdomen.

In our study, we found out that 2% of acute abdomen in pregnancy was due to surgical causes. This was in concordance with the findings of Zachariah *et al.* [3] [5] who reported that 1% - 2% of all pregnant women will require surgery.

Acute appendicitis was the most common non-obstetric surgical aetiology of acute abdomen in our study. This finding was consistent with previous studies in neighbouring Nigeria [12] [13], the United Kingdom [14] [15], and India [16]. Also, it agrees with the global picture where acute appendicitis in pregnancy is the most common cause of emergency non-obstetric surgical abdomen affecting 1 in 1500 pregnancies [17]. All our appendicitis cases appeared in the 2nd trimester of pregnancy.

Cholecystitis was the 2nd most common non-obstetric surgical aetiology of acute abdomen. Similar findings have been reported by other studies [2] [18] [19] [20]. However, this was different from a study by Shambe and friends at Jos University Teaching Hospital in Northern Nigeria who found that splenic and transverse colon injury was the 2nd most common aetiology of acute abdomen in pregnancy [12]. This disparity could be explained by the fact that they included injury pregnant women.

Ectopic pregnancy was the most common obstetric cause of acute abdomen in this study with an incidence of 1.0% in 5 years. This is similar to the 1.4% observed by Njingu *et al.* in Buea [21], 1.1% by Priso *et al.* in Douala [22], and 1.3% by Udigwe in Nigeria [20], and the global range of 1% - 2% [23] [24]. Nonetheless, it was slightly higher than the 0.79% reported by Kouam *et al.* in Yaounde [25]. This discrepancy could be attributed to the fact that the study by Kouam *et al.* was a community-based study. It took into account all deliveries in the population including centers without a theater. Our study was a hospital-based study at 3 referral centers with a higher number of operative cases.

Abdominal pain and abdominal tenderness were the most consistent symptom and signs respectively. This finding was in line with that of Woodhead *et al.* 2019 [14] who reported that abdominal pain and tenderness were found in 100% of participants.

In this study, we also found that vomiting was the commonest associated symptom. This result is similar to that of Jain *et al.* [7] who showed that abdominal pain was the commonest symptom (100%) followed by vomiting (71.4%).

5. Conclusions

The prevalence of acute abdomen in pregnancy in the Southwest Cameroon is higher than the global prevalence hence; this study should serve as an alarm or alert to primary care physicians.

The aetiology of acute abdomen in pregnancy can be broadly classified as pregnancy-related (obstetric) and non-pregnancy-related (non-obstetric) causes. Ectopic pregnancy is the commonest Obstetric aetiology whereas acute appendicitis is the commonest Non-obstetric surgical aetiology of acute abdomen in pregnancy.

Abdominal pain and tenderness were the most consistent clinical presentation.

Limitation

The main limitation of this study was incomplete data (aetiological diagnosis) in some files. To overcome this, we excluded 20 files that had no aetiological diagnoses.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Stedman's. Stedman's Medical Dictionary, 27th Edition Deluxe. <https://www.alibris.com/Stedmans-Medical-Dictionary-27th-Edition-Deluxe-Stedmans/book/30000738>
- [2] Cervellin, G., Mora, R., Ticinesi, A., Meschi, T., Comelli, I., Catena, F. and Lippi, G. (2016) Epidemiology and Outcomes of Acute Abdominal Pain in a Large Urban Emergency Department: Retrospective Analysis of 5,340 Cases. *Annals of Translational Medicine*, **4**, Article No. 362. <https://doi.org/10.21037/atm.2016.09.10>
- [3] Zachariah, S.K., Fenn, M., Jacob, K., Arthungal, S.A. and Zachariah, S.A. (2019) Management of Acute Abdomen in Pregnancy: Current Perspectives. *International Journal of Women's Health*, **11**, 119-134. <https://doi.org/10.2147/IJWH.S151501>
- [4] Sivanesaratnam, V. (2000) The Acute Abdomen and the Obstetrician. *Best Practice & Research Clinical Obstetrics & Gynaecology*, **14**, 89-102. <https://doi.org/10.1053/beog.1999.0065>
- [5] Augustin, G. and Majerovic, M. (2007) Non-Obstetrical Acute Abdomen during Pregnancy. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **131**, 4-12. <https://doi.org/10.1016/j.ejogrb.2006.07.052>
- [6] Ojaghihaghghi, S., Vahdati, S.S., Taghavi, S., Jahandari, A.R., Majd, P.S. and Mirza-Aghazadeh-Attari, M. (2018) Epidemiological Study of Pregnant Women Admitted to the Emergency Department. *Journal of Emergency Practice and Trauma*, **4**, 44-47. <https://doi.org/10.15171/jept.2017.21>
- [7] Jain, R. and Gupta, V. (2016) A Prospective Study of Epidemiology and Clinical Presentation of Non-Traumatic Acute Abdomen Cases in a Tertiary Care Hospital of Central India. *International Surgery Journal*, **4**, 242-245. <https://doi.org/10.18203/2349-2902.isj20164449>

- [8] Kameoka, S. and Ogawa, S. (2001) Acute Abdomen in Pregnancy. *Japan Medical Association Journal*, **44**, 496-500.
- [9] Hizam, A.R., Hamad, S.O. and AL-Obaidi, S.M. (2012) Acute Abdomen during Pregnancy in Baghdad. *AL-Kindy College Medical Journal*, **8**, 1-5.
- [10] Hamad Al-Dahhan, F. and A Hassan, E. (2004) Acute Abdomen in Pregnancy: Aetiology & Outcome in Basrah. *Basrah Journal of Surgery*, **10**, 92-98. <https://doi.org/10.33762/bsurg.2004.57545>
- [11] Gallagher, E.J., Lukens, T.W., Colucciello, S.A., Morgan, D.L., Cantrill, S.V., Campbell, M., *et al.* (2000) Clinical Policy: Critical Issues for the Initial Evaluation and Management of Patients Presenting with a Chief Complaint of Nontraumatic Acute Abdominal Pain. *Annals of Emergency Medicine*, **36**, 406-415. <https://doi.org/10.1067/mem.2000.109446>
- [12] Shambe, I.H., Dikkol, N. and Ozoilo, K.N. (2016) Pregnancy Outcome Following Non-Obstetric Abdominal Surgery in Jos University Teaching Hospital: A 5-Year Retrospective Study. *Nigerian Journal of Clinical Practice*, **19**, 591-594. <https://doi.org/10.4103/1119-3077.188712>
- [13] Alatise, O.I., Lawal, O.O., Agbakwuru, E.A., Adesunkanmi, A.R.K., Faponle, A.F., Dare, F.O., *et al.* (2007) Emergency Non-Obstetric Abdominal Surgery in Pregnancy. *East and Central African Journal of Surgery*, **12**, 28-35.
- [14] Woodhead, N., Nkwam, O., Caddick, V., Morad, S. and Mylvaganam, S. (2019) Surgical Causes of Acute Abdominal Pain in Pregnancy. *The Obstetrician & Gynaecologist*, **21**, 27-35. <https://doi.org/10.1111/tog.12536>
- [15] Shervington, J.P. and Cox, C. (2000) Abdominal Pain in Pregnancy: Diagnosis, Surgery and Anaesthesia. *The Obstetrician & Gynaecologist*, **2**, 17-22. <https://doi.org/10.1576/toag.2000.2.1.17>
- [16] Arora, D., Bhattacharyya, T.K., Kathpalia, S.K., Kochar, S.P.S. and Lele, P.R. (2005) Acute Abdomen in Gynaecological Practice. *Medical Journal Armed Forces India*, **61**, 66-70. [https://doi.org/10.1016/S0377-1237\(05\)80124-8](https://doi.org/10.1016/S0377-1237(05)80124-8)
- [17] Visser, B.C., Glasgow, R.E., Mulvihill, K.K. and Mulvihill, S.J. (2001) Safety and Timing of Nonobstetric Abdominal Surgery in Pregnancy. *Digestive Surgery*, **18**, 409-417. <https://doi.org/10.1159/000050183>
- [18] Alouini, S., Valery, A., Lemaire, B., Evrard, M.L. and Belin, O. (2022) Diagnosis and Management of Pregnant Women with Placental Abruption and Neonatal Outcomes. *Cureus*, **14**, e21120. <https://doi.org/10.7759/cureus.21120>
- [19] Page, N., Roloff, K., Modi, A.P., Dong, F. and Neeki, M.M. (2020) Management of Placental Abruption Following Blunt Abdominal Trauma. *Cureus*, **12**, e10337. <https://doi.org/10.7759/cureus.10337>
- [20] Udigwe, G.O., Umeononihu, O.S. and Mbachu, I.I. (2010) Ectopic Pregnancy: A 5 Year Review of Cases at Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi. *Nigerian Medical Journal*, **51**, 160-163.
- [21] Njingu, A.E., Cumber, S.N., Geh, M.M., Edgar, M.M.L., Nkfusai, C.N., Ngunde, J.P. and Halle-Ekane, G.E. (2020) Incidence, Risk Factors, Clinical Presentation and Treatment of Ectopic Pregnancy in the Limbe and Buea Regional Hospitals in Cameroon. *PAMJ-Clinical Medicine*, **2**, Article 95. <https://doi.org/10.11604/pamj-cm.2020.2.95.21279>
- [22] Priso, E.B., Njamen, T.N., Mboudou, E. and Sama, A.D. (2009) Identification de Certains Facteurs Cliniques de Risque des Grossesses Extra-Uterines a l'Hopital General de Douala. *Health Sciences and Disease*, **10**.

- [23] Dvash, S., Cuckle, H., Smorgick, N., Vaknin, Z., Padoa, A. and Maymon, R. (2021) Increase Rate of Ruptured Tubal Ectopic Pregnancy during the COVID-19 Pandemic. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **259**, 95-99. <https://doi.org/10.1016/j.ejogrb.2021.01.054>
- [24] Gerema, U., Alemayehu, T., Chane, G., Desta, D. and Diriba, A. (2021) Determinants of Ectopic Pregnancy among Pregnant Women Attending Referral Hospitals in Southwestern Part of Oromia Regional State, Southwest Ethiopia: A Multi-Center Case Control Study. *BMC Pregnancy and Childbirth*, **21**, Article No. 130 <https://doi.org/10.1186/s12884-021-03618-7>
- [25] Kouam, L., Kamdom-Moyo, J., Doh, A.S. and Ngassa, P. (1996) Treatment of Ectopic Pregnancies by Laparotomy in Under-Equipped Countries. A Series of 144 Cases at the Yaounde University Hospital Center (Cameroon). *Journal de Gynecologie, Obstetrique et Biologie de la Reproduction*, **25**, 804-808.