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Frequency and Management of Ectopic Pregnancies at the University Hospital Center of Borgou/Alibori (Chud-B/A), Benin, from 2017 to 2022

Roger Klikpézo[1*], Mahublo Vinadou Vodouhè[1], Ingrid Benedicte Olowo[1], Beaudouin Jean-de-Dieu Edaye[2], Yèyinou Aurelle Ahouingnan[1], Eric Dettin[3], Dagbéssè Elysée Boko Dagoun[4,5], Raoul Atadé[6], Rachidi Sidi Imorou[1], Awade Afoukou Achille Obossou[1], Fanny Maryline Nouessèwa Hounkponou Ahouingnan[1], René Xavier Perrin[7], Kabibou Salifou[1]

[1]Faculty of Medicine, University of Parakou (FM-UP), Parakou, Benin
[2]Research Centre in Epidemiology and Population Health (CaRESaP), Parakou, Benin
[3]Military Instruction Hospital-University Hospital Centre (HIA-CHU), Parakou, Benin
[4]Department of Obstetrics and Gynecology, University Hospital Center of Bouaké, Bouaké, Côte d'Ivoire
[5]Mother and Child Department, Alassane Ouattara University, Bouaké, Côte d'Ivoire
[6]Institute of Training in Nursing and Midwifery Care, University of Parakou, Parakou, Benin
[7]Faculty of Health Sciences, University of Abomey-Calavi, Cotonou, Benin
Email: *kliroger@yahoo.fr

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Abstract

Introduction: Ectopic pregnancy (EP) threatens both the functional prognosis (future fertility) and the vital prognosis of the patient. It constitutes a medico-surgical emergency requiring comprehensive emergency obstetric care. **Objective:** To assess the frequency and management of women diagnosed with ectopic pregnancy at the CHUD-B/A from 2017 to 2022. **Methods:** This was a descriptive cross-sectional observational study with retrospective data collection conducted at the CHUD-B/A, including all patients managed for ectopic pregnancy from January 1, 2017 to December 31, 2022 (6-year period). **Results:** Among 13,101 pregnancies managed during the study period, 176 cases of ectopic pregnancy were recorded, yielding a frequency of 1.34% (95% CI: 1.16% - 1.56%); 157 records with complete data were retained for analysis. The mean patient age was 28 ± 5.8 years. The most represented groups were low-parity patients (40.38%), nulliparous women (33.76%), and urban residents (66.24%). Ruptured ectopic pregnancy accounted for 80.25% of cases. The most common anatomical locations were ampullary and isthmic. Management was predominantly surgical via laparotomy, with radical treatment

performed in 94.90% of cases. More than half of the patients (61.78%) received blood transfusions, of whom 59.79% underwent autotransfusion. **Conclusion:** Ectopic pregnancy remains a relatively frequent condition at the CHUD-B/A. This study demonstrated that late diagnosis at the complication stage limits therapeutic options. Autotransfusion represents a viable alternative in the context of blood product shortages.

Keywords

Ectopic Pregnancy, Diagnosis, Therapeutic Management, Prognosis, CHUD-B/A

1. Introduction

Ectopic pregnancies (EPs) are pregnancies that implant and develop outside the uterine cavity, most commonly within the fallopian tube [1] [2]. Approximately 1% to 2% of all pregnancies are ectopic [3].

Even in developed countries such as the United States, where advanced medical technologies are available and most such conditions are well-controlled, ectopic pregnancy remains a significant public health concern, with a hospital-based incidence estimated at approximately 2% [3] [4].

In sub-Saharan Africa, where access to maternal healthcare is often limited, the prevalence of ectopic pregnancy is even higher, and associated maternal mortality is considerably elevated [5] [6].

The prevalence of ectopic pregnancy remains high in Benin, as in other West African countries [7].

The maternity ward of the Departmental University Hospital of Borgou and Alibori (CHUD-B/A) is one of the main maternal healthcare centers in Benin and records an increasing number of ectopic pregnancy cases each year. It is therefore essential to understand the hospital-based frequency of ectopic pregnancies and their management within the context of blood product shortage.

2. Methods

This was a cross-sectional observational study with retrospective data collection, encompassing 157 cases managed at the CHUD-B/A from January 1, 2017 to December 31, 2022. The target population included all women followed for pregnancy and managed in the maternity ward during this period, while the study population comprised patients admitted for ectopic pregnancy. Inclusion criteria required that patients had been managed for an EP at the CHUD-B/A during the study period and had a complete medical record. Lost, incomplete, or unavailable medical records, as well as cases of ectopic pregnancy not managed at the facility, were excluded.

The study variables included a primary variable, defined as any ectopic pregnancy. Because beta-hCG quantitative assay was performed in only two patients

(1.27%), the operational case definition relied on a combination of clinical presentation (amenorrhea with or without vaginal bleeding and pelvic pain), a positive qualitative urine pregnancy test, and pelvic ultrasound findings (empty uterus with or without latero-uterine mass and/or hemoperitoneum). Final confirmation of ectopic pregnancy was based on intraoperative findings at laparotomy in all 157 analyzed cases; histopathological examination of the surgical specimen was not systematically available. Secondary variables included sociodemographic and individual characteristics, clinical and paraclinical data, and therapeutic parameters.

Data were collected comprehensively from medical records, admission, consultation, and operating room registers using a standardized data collection form. The following operational definitions were applied: 1) ruptured ectopic pregnancy was defined as the intraoperative finding of an interrupted gestational sac with hemoperitoneum at laparotomy; 2) postoperative anemia was defined as a hemoglobin level below 11 g/dL measured within the first 48 hours after surgery; and 3) postoperative morbidity was defined as the occurrence of any intraoperative or postoperative complication (bowel injury, intraoperative hemorrhage, cardiac arrest, postoperative anemia, wound infection) before hospital discharge. The morbidity rate was calculated as the number of patients presenting at least one complication divided by the total number of analyzed cases (n = 157). Data entry was performed using EpiData 3.2, and statistical analyses were conducted using MedCalc 19.4.1 and Epi Info 7, while Microsoft Excel 2016 was used to generate figures and tables. Ethical approval was granted by the Local Ethics Committee for Biomedical Research of the University of Parakou (CLERB-UP 135/2023).

3. Results

3.1. Frequency of Ectopic Pregnancies at the CHUD-B/A between 2017 and 2022

A total of 157 medical records of ectopic pregnancy cases were included in this study. During the study period, 176 cases of ectopic pregnancy were recorded among 13,101 pregnancies managed in the gynecology and obstetrics department, yielding a frequency of 1.34% (95% CI: 1.16% - 1.56%). Of these, 19 records were excluded due to incompleteness or unavailability, and 157 cases with complete medical records were retained for the descriptive analyses presented below.

3.2. Epidemiological Characteristics

The 157 patients ranged in age from 17 to 47 years. The mean age was 28 ± 5.8 years, and the modal age group was [25 - 30[years. Housewives accounted for 29.30% of patients (46/157), and 24.84% had attained university-level education (Table 1); educational level was not specified in 37.58% (59/157) of records. Marital status was not specified in 47.77% (75/157) of records, and among those with documented status, 11.46% (18/157) were single. Place of residence was documented for all 157 patients, of whom 66.24% (104/157) resided in urban areas. All percentages are calculated on the 157 analyzed cases unless otherwise stated.

3.3. Clinical Characteristics of Patients

The majority of patients (89.81%) reported a history of amenorrhea. Pelvic pain was noted in 90.45% of women in the study sample. Metrorrhagia, presyncope and/or syncope, and nausea were reported in 51.59%, 22.29%, and 2.55% of cases, respectively (Table 2).

Table 1. Distribution of ectopic pregnancy cases from 2017 to 2022 according to sociodemographic characteristics (CHUD-B/A, Parakou).

	Frequency (n = 157)	Percentage (%)
Occupation		
▪ Housewife	46	29.30
▪ Skilled worker/laborer	26	16.56
▪ Trader/vendor	40	25.48
▪ Civil servant	23	14.65
▪ Student	14	08.92
▪ Other*	08	05.10
Educational level		
▪ No formal education	21	13.38
▪ Primary	19	12.10
▪ Secondary	19	12.10
▪ University	39	24.84
▪ Not specified	59	37.58
Marital status		
▪ Not specified	75	47.77
▪ Married	33	21.02
▪ Common-law union	31	19.75
▪ Single	18	11.46
Place of residence		
▪ Urban	104	66.24
▪ Rural	53	33.76

*Student (7); Secretary (1).

Table 2. Distribution of ectopic pregnancy cases from 2017 to 2022 according to amenorrhea, spontaneous pelvic pain, metrorrhagia, presyncope/syncope, and nausea (CHUD-B/A, Parakou).

	Frequency (n = 157)	Percentage (%)
Amenorrhea	141	89.81
Spontaneous pelvic pain	142	90.45
Metrorrhagia	81	51.59
Presyncope and/or syncope	35	22.29
Nausea	04	02.55
Classic symptomatic triad**	64	40.76

**Simultaneous presence of amenorrhea, spontaneous pelvic pain, and metrorrhagia.

Localized pain was present in 45.86% of patients, and 6.37% had an enlarged uterus. Six of the 157 patients (3.82%) presented with a fluid thrill sign, and 49.68% had umbilical tenderness. Additionally, 36.31% of patients had Douglas pouch tenderness. These findings are summarized in Table 3.

Table 3. Distribution of ectopic pregnancy cases from 2017 to 2022 according to pain localization and uterine size (CHUD-B/A, Parakou).

	Frequency (n = 157)	Percentage (%)
Localized pain	72	45.86
Normal-sized uterus	08	05.10
Enlarged uterus	10	06.37
Fluid thrill sign	06	03.82
Umbilical tenderness	78	49.68
Douglas pouch tenderness	57	36.31

Overall, 26.11% of patients underwent transparietal puncture; 15.29% underwent Douglas pouch puncture; and 7.64% had a latero-uterine mass. These data are detailed in Table 4.

Table 4. Distribution of ectopic pregnancy cases from 2017 to 2022 according to pain localization, presence of latero-uterine mass, transparietal puncture, and Douglas pouch puncture (CHUD-B/A, Parakou).

	Frequency	Percentage (%)
Pain localization		
▪ Right iliac fossa	32	44.44
▪ Hypogastric region	19	26.39
▪ Left iliac fossa	16	22.22
▪ Other***	05	06.95
Total	72	100.00
Latero-uterine mass		
▪ Absent	145	92.36
▪ Present	12	7.64
Total	157	100.00
Transparietal puncture		
▪ Not performed	116	73.89
▪ Performed	41	26.11
Result of transparietal puncture		
▪ Negative	25	60.98
▪ Positive	16	39.02

Continued		
Douglas pouch puncture		
▪ Not performed	133	84.71
▪ Performed	24	15.29
Result of Douglas pouch puncture		
▪ Negative	13	54.17
▪ Positive	11	45.83

***Right flank (4), left flank (1).

3.4. Beta-hCG Assay and Ultrasound Findings

Only 1.27% (2/157) of patients had a beta-human chorionic gonadotropin (beta-hCG) assay performed, and the trend of beta-hCG levels was decreasing in both cases. Ultrasound identified a latero-uterine mass in 24 patients and free peritoneal fluid (hemoperitoneum) in 30 cases.

3.5. Diagnosis and Surgical Management

Ectopic pregnancy was ruptured in the majority (80.25%) of cases. All patients underwent surgical treatment via laparotomy. The right side was the predominant anatomical site in 58.60% (92/157) of patients, and the ampullary region was the most common location, accounting for 64.33% (101/157) of cases. Bilateral ectopic pregnancy was identified in 1.91% of cases. These findings are presented in Table 5.

Table 5. Distribution of ectopic pregnancy cases from 2017 to 2022 according to anatomical location (CHUD-B/A, Parakou).

	Frequency	Percentage (%)
Laterality of EP		
▪ Right	92	58.60
▪ Left	62	39.49
▪ Bilateral	03	01.91
Anatomical location of EP		
▪ Ampullary	101	64.33
▪ Isthmic	19	12.10
▪ Cornual	15	09.55
▪ Infundibular	07	04.46
▪ Ovarian	07	04.46
▪ Other****	08	05.10

****Isthmo-ampullary (2), abdominal (2), interstitial (4).

3.6. Therapeutic Characteristics

All patients (100%) received surgical treatment, exclusively via laparotomy. The majority of patients (94.90%) underwent radical surgical treatment, and salpingectomy was the most frequently performed procedure (84.71%), as detailed in Table 6.

Table 6. Distribution of ectopic pregnancy cases from 2017 to 2022 according to type of treatment and surgical procedure (CHUD-B/A, Parakou).

	Frequency (n = 157)	Percentage (%)
Type of treatment		
▪ Radical	149	94.90
▪ Conservative	08	5.10
Type of surgical procedure		
▪ Salpingectomy	133	84.71
▪ Adnexectomy	16	10.19
▪ Salpingotomy	08	5.10

3.7. Blood Transfusion

The majority (61.78%) of patients received blood transfusion. Of these, 59.79% received autotransfusion (intraoperative blood salvage) and 40.21% received allogeneic transfusion.

3.8. Postoperative Outcomes

Morbidity. Intraoperative complications included bowel injury (0.64%), hemorrhage (1.91%), and cardiac arrest on the operating table (1.91%). Postoperative complications included anemia in 61.15% of patients.

Mortality. One death was recorded among the 157 women included in the study (0.64%).

4. Discussion

4.1. Frequency of Ectopic Pregnancies

During the study period, 176 cases of ectopic pregnancy were recorded among 13,101 pregnancies managed in the gynecology and obstetrics department of the CHUD-B/A, yielding a frequency of 1.34%. This rate is consistent with those reported by Pamphile *et al.* [1] in 2022 in Gabon (1.30%), Bangambe *et al.* [8] in 2016 in the Democratic Republic of Congo (1.56%), and Achour *et al.* [9] in 2015 in Tunisia (1.02%). However, higher frequencies have been reported by Dohbit *et al.* [10] in Cameroon (2.3%) and Shobeiri *et al.* [11] in Iran (4.8%). These discrepancies may be partly explained by longer study periods in those investigations (10 years) compared with ours (6 years, 2017-2022). In the literature, the frequency of ectopic pregnancy varies substantially across different settings. Jacob *et al.* [12] in

2017 in Germany reported a frequency of 3%, while Andriamifidison *et al.* [13] in 2016 in Madagascar found a frequency of 1.67%. In Mauritania, Ijar and Abdelkader [14] recorded a frequency of 0.99% in 2019, and Kenfack *et al.* [15] in Cameroon reported 3.45% in 2012. These variations are likely attributable to differences in study methodologies, study populations, and geographic and cultural contexts.

4.2. Therapeutic Characteristics and Clinical Management

All cases were managed surgically via laparotomy. No laparoscopic or medical treatment was performed.

Laparotomy remains the most widely used therapeutic approach in Africa. Laparoscopic surgery, which represents the gold standard for ectopic pregnancy management in developed countries, remains of limited use across Africa due to inadequate equipment and late patient presentation, which typically results in diagnosis at the complication stage. Recent international reviews emphasize that early diagnosis through combined β-hCG monitoring and transvaginal ultrasound is the cornerstone of fertility-preserving management, allowing medical (methotrexate) or conservative laparoscopic options to be offered to hemodynamically stable patients [16] [17]. In our setting, the very low rate of β-hCG assay (1.27%) and the predominance of ruptured presentations precluded these less invasive options.

In our series, surgical treatment following laparotomy was radical in 94.90% of cases and conservative (salpingotomy) in 5.10%. Salpingectomy was the most frequently performed procedure, with a frequency of 84.71%. Pamphile *et al.* [1] and Andriamifidison *et al.* [13] reported similar rates of 83.3% and 85.4%, respectively. This procedure is the most commonly performed according to multiple authors [8] [10] [18] [19]. The predominance of salpingectomy in this study also reflects the fact that the majority of patients presented at the complication stage, necessitating resection of the pathological tubal segment. A recent meta-analysis comparing salpingectomy and salpingotomy reported broadly similar long-term fertility outcomes when the contralateral tube is healthy, supporting salpingectomy as an acceptable option in hemodynamically unstable patients such as those typically encountered in our setting [20]. Nevertheless, broader access to early diagnosis would expand the proportion of women eligible for fertility-preserving approaches.

The anatomical location of ectopic pregnancy in our series was primarily tubal (78.98%), including 64.33% ampullary, 12.10% isthmic, and 2.55% interstitial. Bangambe *et al.* reported nearly similar findings: 57.7% ampullary, 22.7% isthmic, and 4.3% interstitial [8]. Koutora *et al.* [19] found 82.14% ampullary, 3.57% isthmic, 3.6% ovarian, 7.1% cornual, and 3.6% abdominal locations. These results are consistent with the existing literature. The predominance of ampullary implantation is attributable to the favorable nidation conditions within the ampullary portion of the fallopian tube.

In our series, 61.78% of patients required blood transfusion. These findings are

comparable to those reported by Koutora *et al.* [19] and Bangambe *et al.* [8], with frequencies of 67.8% and 66.6%, respectively. However, these rates are markedly higher than those reported by Dohbit *et al.* [10] (2.40%), Baldé *et al.* [18] (11.71%), Kenfack *et al.* [15] (20.5%), and Nayama *et al.* [21] (39.9%). This difference may be explained by the fact that most women in our series presented with ruptured ectopic pregnancy complicated by hemoperitoneum.

4.3. Postoperative Outcomes

The postoperative course of our patients was more frequently complicated (61.15%, calculated as the number of patients with at least one postoperative complication, predominantly anemia, divided by 157 analyzed cases) than that reported by certain African authors. Baldé *et al.* found that 31.1% of women experienced complications [18], and Dohbit *et al.* [10] reported a substantially lower postoperative complication rate (1.48%). These differences may be attributable to the clinical condition of patients at hospital admission. According to Bouyer *et al.* [22], the nature and rate of complications depend on the implantation site of the ectopic pregnancy.

The case fatality rate associated with ectopic pregnancy in our series was 0.64% (1/157). This result is consistent with that reported by Nayama *et al.* in Niger, who found a mortality rate of 0.7% [21]. In contrast, Baldé *et al.* [18] in Conakry in 2014 and Madoue *et al.* [23] in Chad in 2015 reported mortality rates of 1.8% and 1.9%, respectively, which are higher than our findings. No specific explanation can be offered for this discrepancy, as working conditions in our institution do not substantially differ from those in these countries. The single fatality occurred in the context of hypovolemic shock secondary to hemorrhage.

5. Conclusion

Ectopic pregnancy remains a relatively frequent condition at the CHUD-B/A. This study demonstrated that late diagnosis at the complication stage substantially limits therapeutic options. Autotransfusion represents a viable alternative in the context of blood product shortages. The following measures are recommended based on the findings of this study: facilitating early diagnosis to improve clinical management and preserve future fertility.

Conflicts of Interest

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

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