

Ectopic pregnancy in Conakry, Guinea

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Objective To assess the incidence of ectopic pregnancy (EP) in hospitals in Conakry, the capital of Guinea, West Africa. Data on EP incidence in developing countries are rare and often out of date, particularly in Africa.

Methods A retrospective study was carried out, examining all cases of EP registered in the medical files of two referral maternity units at the Donka and Ignace Deen university hospitals between 1995 and 1999.

Findings The EP incidence at the two maternity units increased from 0.41% to 1.5% of annual deliveries over this period. Haemoperitoneum was observed in most women, with tubal rupture in 93%; only 6 women received conservative treatment.

Conclusion The results suggest that the hospital-based incidence of EP per delivery has increased over the last decade in this West African capital, and that health professionals and public health officials in developing countries, especially those in Africa, should consider EP as a major obstetric problem for maternal morbidity.

Keywords Pregnancy, Ectopic/epidemiology/diagnosis/complications; Retrospective studies; Risk factors; Guinea (*source: MeSH, NLM*).

Mots clés Grossesse extra-utérine/épidémiologie/diagnostic/complication; Facteur risque; Etude rétrospective; Guinée (*source: MeSH, INSERM*).

Palabras clave Embarazo ectópico/epidemiología/dagnóstico/complicaciones Factores de riesgo; Estudios retrospectivos; Guinea (*fente: DeCS, BIREME*).

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Introduction

Ectopic pregnancy (EP) is defined as a pregnancy in which the implantation of the embryo occurs outside the uterine cavity, most frequently in one of the two fallopian tubes or, more rarely, in the abdominal cavity. During the first three months of pregnancy, EP is the leading cause of maternal death in industrialized countries, and possibly the second most frequent cause in developing countries (after abortion complications). In most of Europe and North America, the incidence of EP has tripled over the last 30 years and is currently estimated at 2% of live births (1). A study in Norway, for example, found that the incidence of EP increased from 1.4% to 2.2% of live births between 1976 and 1993 (2). In England and Wales, the incidence of EP increased by a factor of five between 1966 and 1996 (from 0.3% to 1.6% of live births) (3). Similarly, in the USA, the incidence of EP increased from 1.9% to 2.3% of live births between 1981 and 1991 (4). However, recent studies have shown a decrease in the incidence of EP in Scandinavian countries (5).

Data on EP are rare and often out of date in developing countries, particularly in Africa. A review of EP in developing countries from the 1960s to the mid-1980s showed that the incidence of EP was between 0.5% and 2.3% of live births in Africa (6). In 1992 and 1993, a study at Umtata general hospital

(in the Transkei, South Africa) reported an EP incidence of 1.1% (7). Between 1993 and 1995, the hospital-based EP incidence was 2.9% at Nosy Be Hospital (Madagascar), and up to 4% at the gynaecology and obstetrics clinic of the national teaching hospital in Cotonou (Benin) (8, 9). In Nigeria (Ile-Ife teaching hospital), the hospital-based incidence of EP quadrupled between 1977 and 1987 (from 0.4% to 1.7%), and in Gabon (university medical centre of Libreville) it more than doubled between 1977 and 1989, from 1% to 2.3% (10, 11). At Yaoundé university hospital (Cameroon), the incidence of EP increased from 0.9% to 1.7% between 1984 and 1992 (12). In contrast, between 1978 and 1981, the EP incidence decreased at the teaching hospital in Enugu (Nigeria), from 0.53% to 0.21% of deliveries (13).

These observations suggest that the incidence of EP in developing countries, especially on the African continent, has probably increased in recent decades. To assess the incidence of EP in a city of West Africa, we conducted a retrospective hospital-based study in Conakry, Guinea, from 1995 to 1999.

Methods

Conakry, the capital of Guinea (West Africa), has two large well-equipped public university hospitals (Donka and Ignace Deen) with experienced staff, which handle the major

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gynaecological and obstetric emergencies in the urban areas of Conakry. The two referral maternity units have three registers: one for admissions (dedicated to gynaecological and obstetric complications), one for deliveries, and one for maternal deaths. The normal procedure is to register each woman admitted for any gynaecological, obstetric, or surgical reason in one of the three registers. Registers of births, gynaecological and obstetric emergencies, and maternal deaths are available from 1995 onwards. Other health facilities are available in Conakry, including maternity and surgery units, but these units have no systematic case registration and do not produce health statistics. The majority of emergency gynaecological and obstetric cases admitted to these other health facilities are often treated locally, but some are also referred to the maternity units of the two university hospitals.

We set up a research team of five junior obstetricians, two senior obstetricians from the Donka and Ignace Deen hospitals, and two consultants from France (an obstetrician and a demographer). The French consultants trained all the obstetric students for one week in the analysis of registers and obstetric data and in the compilation of an EP questionnaire. A specific EP questionnaire was developed that included items dealing with the sociodemographic characteristics of the women (age, marital status, and occupation), and their medical and surgical history. We paid specific attention to infertility, using a long time to conceive (more than 12 months) as an indicator. We also checked for a history of EP; for EP management at the hospital (whether the fallopian tube was intact or ruptured); for localization of EP in the fallopian tube and abdominal cavity; whether the surgical treatment was radical or conservative; and the vital outcome for the women.

Between January and June 2000, data from the registers were compiled for the period 1995–99. All cases of EP were identified, checked by the two senior Guinean obstetricians, and the specific EP questionnaire was then filled out by the research team. At the referral hospitals, autopsies were not carried out following maternal deaths. Approximately one-third of maternal deaths occurred in the first few hours after admission (in the emergency room), with no precise diagnosis of the cause of death. We also obtained the number of deliveries registered at the two maternity units during the same period, 1995–99, from the Guinean Ministry of Health.

The data collected with EP questionnaires were entered into a database (STATA software), and descriptive statistics for the main variables analysed and verified by the staff (i.e. two Guinean obstetricians, one French obstetrician and one French demographer). Aberrant information was checked by direct consultation of the corresponding obstetric files in Guinea and corrected. STATA software was used to analyse the data (*t* test, with $P < 0.05$ considered significant).

Results

Between 1995 and 1999, 227 cases of EP were registered at the two maternity units in Conakry. Seven non-resident women living beyond Conakry city limits were excluded from the study, leaving a total of 220 EP cases for the study. The main sociodemographic characteristics of the 227 women are shown in Table 1. The number of EP cases in the Conakry maternity units increased from 26 in 1995 to 59 in 1999 (Fig. 1). During the same period, the number of registered births decreased from 6317 in 1995 to 3872 in 1999. Thus, the estimated

Table 1. Sociodemographic characteristics of the study participants^a

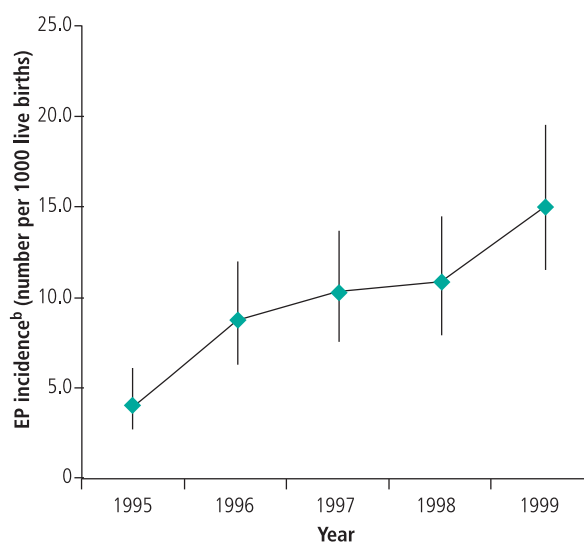
Characteristic	<i>n</i>
Marital status	
Single	37 (16.8) ^b
Married	171 (77.7)
Data unavailable	12 (5.5)
Occupation	
Housewife	123 (55.9)
Shopkeeper	30 (13.6)
Employee	24 (10.9)
Artisan/craftsman	24 (10.9)
Student	11 (5.0)
No profession	4 (1.8)
Data unavailable	4 (1.8)
Education level	
None	138 (62.7)
Primary	17 (7.7)
Secondary	44 (20.0)
Superior	5 (2.3)
Data unavailable	16 (7.3)
Average age in years \pm 1 SD^c	
<i>n</i> = 227	27 \pm 5.6

^a A total of 227 women presented with ectopic pregnancy, but only 220 participated in the study. The demographic data are for the 220 participating women.

^b Figures in parentheses are percentages.

^c SD = standard deviation.

Fig. 1. Evolution of ectopic pregnancy (EP) incidence,^a 1995–99, Conakry, Guinea



^a Annual EP incidence from 1995 to 1999: $P < 0.01$ (Poisson distribution).

^b The bars represent standard deviations.

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hospital-based EP incidence per delivery increased from 0.41 in 1995 to 1.5 in 1999. The overall increase in EP incidence was statistically significant using the test of proportion for a Poisson distribution ($P < 0.01$).

Of the 220 women admitted for EP between 1995 and 1999, 45 (5%) had had a previous EP, and 21 (10%) had experienced difficulties in conceiving (it took more than

12 months to conceive). Ultrasound scans were performed for only 10 women, a urine-based pregnancy test for seven women, and culdocentesis for four women. In patients with an abdominal syndrome associated with haemoperitoneum, EP was diagnosed by clinical and vaginal examinations.

Abdominal surgery was carried out in all 220 EP cases, 94 of them by a general practitioner, and 121 cases by an obstetrician. The medical qualification of the doctor was not specified in five cases. Haemoperitoneum was observed in 89.5% of the women (197/220), with tubal rupture in 93% (200/216) of the cases (in four cases, data on tubal rupture were missing); only six women received conservative treatment (i.e. careful and methodical ablation of the EP only, conserving the fallopian tube). The EP was located in the ampulla in 144 cases, in the isthmus in 55 cases, and in the abdominal lumen in 18 cases; in three cases, the precise location was not clearly indicated. The contralateral fallopian tube was absent in 12 women (all of whom had had a previous EP) and inflammatory adhesions were observed in the contralateral fallopian tube in 22 women. Postoperative complications (sepsis) were observed in 10/215 (4.6%) women during their stay in hospital (no data were available for five cases), but no maternal deaths were registered among the 220 women. We verified the information on maternal death by checking emergency registers from the two referral hospitals, as well as other sources of information corresponding to the same period of time.

Discussion

The role of sexually transmitted diseases in EP

The results of our study suggest that the incidence of EP since 1995 has increased in the two referral maternity units of Conakry, consistent with earlier studies in African countries (10–12, 14). The observed increase in sexually transmitted diseases (STDs) and pelvic sepsis during pregnancy (especially after unsafe abortion) may have contributed to this increase, but other studies in developing countries suggest that previous induced abortions, a prior EP, infertility and pelvic inflammatory disease may also be risk factors for EP. For example, a WHO multicentre case-control study, carried out mainly in centres in developing countries, compared 1108 EP cases with an equal number of pregnant and non-pregnant control women, matched for age, parity, and marital status. For both pregnant and non-pregnant women, the relative risk (RR) of EP was higher for those with a past history of pelvic inflammatory disease or STDs (RR = 2.8; 95% confidence interval (CI) 2.1–3.8; RR = 2.0; CI 1.5–2.7), or a previous ectopic pregnancy (RR = 7.0; CI 3.6–13.6; RR = 9.3; CI 4.3–19.7) (15). In a more recent study, 104 women from Zimbabwe treated for EP were compared with 90 randomly recruited women who gave birth during 1984–87 (12 076 total deliveries were recorded during this period). Again, a history of prior pelvic infection was declared by 54% of the women in the group treated for EP (16). In our study too, inflammatory adhesions were observed in the contralateral fallopian tube in 22 cases (10%), indicating a history of severe pelvic inflammation.

In Franceville (Gabon), serum levels of IgG and IgA antibodies against *Chlamydia trachomatis* and *Neisseria gonorrhoeae* were measured in 45 women with EP, and in two control groups. The control groups were 45 pregnant women between 5 and 12 weeks of gestation, and 45 pregnant women between

32 and 41 weeks of gestation, matched for age and parity (17). For *C. trachomatis*, IgG antibodies were detected in 84% of the women in the EP group, and in 53% and 39%, respectively, of the women in the two control groups ($P < 0.0001$). Similarly, IgA antibodies were detected in 62% of the women in the EP group, and in 31% and 29%, respectively, of the women in the control groups ($P < 0.01$). For *N. gonorrhoeae*, although higher levels of IgG and IgA antibodies were also observed in the EP cases, the levels were not significantly different from those in the control group.

In Gabon, 73 of 90 (81%) women with EP were seropositive for *C. trachomatis*, compared to only 120 of 190 (63%) women in the control group who were either pregnant or had just given birth (18). Another study also found higher prevalences of antibodies against *N. gonorrhoeae* and *C. trachomatis* in women with EP (with macroscopic tubal abnormalities), compared to women giving birth to live full-term infants (19). The prevalence of positive results in syphilis tests (rapid plasma reagent test and *Treponema pallidum* haemagglutination assay) was also higher in women with EP than in controls ($P < 0.01$).

Early diagnosis of EP can reduce tubal rupture rates

In the present study, EP was diagnosed by means of clinical and vaginal signs associated with an abdominal syndrome involving evident peritoneal irritation. Ultrasound scans were used in less than 5% of patients. The advantages of ultrasound scan as a diagnostic tool have been demonstrated in Ghana, where transabdominal ultrasound scans increased the proportion of non-ruptured EP from 0.3% to 8.5% (20). In developing countries, the use of ultrasound scan for diagnosing EP at an early stage should be recommended and scans should be introduced in peripheral maternity and gynaecological units in large African capitals such as Conakry (21).

In the present study, a delay in EP diagnosis led to high levels of tubal rupture, as high as 92% of EP cases. This compares with a level of less than 30% of cases in industrialized countries, where the majority of EP cases are diagnosed at an early stage (22). Unfortunately, our results are consistent with previous reports from developing countries. In Senegal, a rupture rate of over 90% was reported among women admitted to Le Dantec university hospital, Dakar, in 1995 (23), and in Nigeria, the rate among women treated at the university teaching hospital of Ile-Ife was 97% (24). In the Nigerian study, hemoperitoneum was noted in 216/235 cases of EP, and EP was diagnosed principally on the basis of this symptom. Similarly, in Gabon, of 429 cases of haemoperitoneum treated by surgery, 412 cases (96%) of EP rupture was found (25).

In Conakry, Guinea, as in many developing countries, surgery remains the mainstay of treatment. Given the high percentage of tubal rupture (82%), salpingectomy was the treatment of choice (96%) in this study. In Benin, a similar rate of salpingectomy (94%) was noted for 223 cases of EP between 1993 and 1994. The authors suggested that there had been a substantial delay in diagnosis and treatment, because most of the women were first examined at peripheral health centres (9).

Consequences of EP complications

We observed that 5% of the 220 women admitted for EP had had a previous EP and that 10% of the women had experienced

some difficulties in conceiving. Few studies have investigated subsequent fertility and the recurrence of EP, especially in Africa (26), but one study showed that only 36% of women became pregnant again during the year following an EP and that 14% of these women had another EP (27). Another study in Gabon found that only 27% of the women who had had an EP became pregnant again within five years, and that one-third of the women had another EP (28). It was concluded that the major prognostic factor for the subsequent fertility of women who had had an EP was the inflammatory and adhesive state of the pelvis and damage to the contralateral fallopian tube. In our study, inflammatory adhesions were observed in the contralateral fallopian tube in 10% of cases.

Finally, no maternal deaths were observed in the two maternity units during the five years of our study, even though a previous study carried out in the Donka referral maternity unit found that 8.6% of women admitted for EP died from this complication (29). One explanation is that the capacity of the gynaecological and emergency staff of the two referral maternity units to care adequately for women admitted for EP has increased. Indeed, during the last 10 years, there has been extensive reorganization of the health structures (public and private) in Guinea, especially in Conakry, and intensive surgery training sessions have been implemented for obstetric staff in referral hospitals. These recent improvements have probably played a key role in decreasing the number of maternal deaths due to EP complications in the two maternity units in this study. A number of other gynaecological and obstetric facilities are available in Conakry, but they are less well equipped and the personnel are less well trained for emergency problems. The population is also aware that the "prices" are much lower at these peripheral facilities than at the two university referral maternity units. Some women with EP complications have probably also been admitted, treated, and died from EP complications in these peripheral health facilities. Unfortunately, we were unable to obtain valid statistics from these health structures, most of which have no register or other medical files.

It can be difficult to distinguish between an EP complication and an abortion complication, especially in cases presenting late. In such cases, there is an abdominal syndrome, the woman may be in shock and may not be conscious. Thus, there may be misclassification of these two first-trimester obstetric complications, especially in peripheral health facilities in which surgery could not be performed.

Bias and limitations of the study

It is difficult to compare the apparent incidence of EP in developing countries with that published for industrialized countries. Almost all births in industrialized countries take place in maternity units and EP is mainly treated in gynaecological or emergency units (in the USA, for example, an increasing number of EP cases are now treated as outpatients). This makes it possible to calculate a "true" incidence of EP with no major bias (for example, by using cohort studies). Unfortunately, methodological limitations make it much more difficult to estimate the incidence of EP in developing countries. Patients often resort to emergency health care late, if at all, and access to hospitals remains limited for socioeconomic and organizational reasons. The recruitment of patients from hospitals is therefore highly selective for women who are geographically and financially able to obtain access to a referral health centre for surgical

management. This situation is not favourable for the management of women suffering from EP and also makes it difficult to calculate precisely the total number of cases of EP. Thus, it is possible that the well-equipped maternity units of the two referral hospitals are attractive to women suffering from obstetric problems and to peripheral health care staff, leading to an apparent increase in EP cases in the two referral maternity units. Nevertheless, this cannot account for the increase in the number of EP cases in our sample, from 40 in 1996 to 59 in 1999.

Similarly, the total number of births recorded in national health registers or Ministry of Health statistics is generally not reliable, given the high percentage of home deliveries. Thus, the number of births is frequently derived from demographic and health surveys, and by census. In our study, we observed a decrease in the number of deliveries in the two maternity units between 1995 and 1999, but this was mainly due to a decrease in deliveries after 1995, and no significant difference was noted in the number of deliveries between 1996 and 1999. One explanation is that the maternity unit in Donka was renovated in 1995 and the cost of admission increased, which would have limited access for the poorest women. The decrease in the number of deliveries between 1995 and the following years may have inflated the EP incidence for 1996–99, but a statistically significant trend towards an increasing EP incidence was also observed if the 1995 data were eliminated from the analysis.

Finally, the design of our study (retrospective approach) and the organizational constraints existing in Conakry (lack of exhaustive registers for all maternity units and lack of detailed health statistics at the maternal health department) may have introduced bias into our study. Thus, further studies on EP incidence must be done in order to confirm the tendency of increased EP incidence seen in this study.

Conclusion

The results of this study suggest that the hospital-based incidence of EP per delivery has increased over the last decade in Conakry, a large West African capital. To limit the bias of hospital-based studies, population-based studies (cohort studies) should be performed to evaluate the overall incidence of EP in African countries and to follow trends over time. It would also be valuable to identify EP risk factors for developing countries, to make it possible to develop specific health programmes. In light of the findings of this study, health professionals and public health officials in developing countries, especially in Africa, should consider EP as a major obstetric problem for maternal morbidity and give urgent attention to this problem. ■

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Conflicts of interest: none declared.

Résumé

Grossesses ectopiques à Conakry (Guinée)

Objectif Evaluer l'incidence des grossesses ectopiques dans les hôpitaux de Conakry, la capitale de la Guinée (Afrique de l'Ouest). Les données sur l'incidence des grossesses ectopiques dans les pays en développement sont rares et souvent dépassées, notamment en Afrique.

Méthodes Une étude rétrospective a été réalisée en examinant tous les cas de grossesse ectopique enregistrés entre 1995 et 1999 dans les dossiers médicaux de deux maternités de recours situées dans les hôpitaux universitaires Donka et Ignace Deen.

Résultats L'incidence des grossesses ectopiques dans les deux maternités est passée pendant la période considérée de 0,41 % à

1,5 % des accouchements pratiqués chaque année. Un hémopéritoine a été observé chez la plupart des femmes, avec rupture tubaire dans 93 % des cas ; seules 6 femmes ont bénéficié d'un traitement conservateur.

Conclusion D'après les résultats, l'incidence des grossesses ectopiques par accouchement a augmenté au cours de la dernière décennie dans les hôpitaux de cette capitale d'Afrique de l'Ouest ; les professionnels de santé et les responsables de la santé publique des pays en développement, en particulier en Afrique, doivent considérer ces grossesses comme un problème obstétrical majeur du point de vue de la morbidité maternelle.

Resumen

El embarazo ectópico en Conakry (Guinea)

Objetivo Evaluar la incidencia de embarazo ectópico (EE) en Conakry, capital de Guinea, África occidental. Los datos sobre la incidencia de EE en los países en desarrollo son escasos, y a menudo obsoletos, sobre todo en África.

Métodos Se llevó a cabo un estudio retrospectivo en el que se examinaron todos los casos de EE registrados en las historias clínicas de dos maternidades de los hospitales universitarios de Donka e Ignace Deen entre 1995 y 1999.

Resultados La incidencia de EE en las dos maternidades aumentó del 0,41% al 1,5% de los partos anuales durante ese periodo. La

mayoría de las mujeres desarrollaron hemoperitoneo, y el 93% sufrieron ruptura tubárica; únicamente 6 mujeres recibieron tratamiento conservador.

Conclusión Los resultados indican que la incidencia hospitalaria de EE por número de partos ha aumentado a lo largo de la última década en esta capital de África occidental, y que los profesionales de la salud y los funcionarios de salud pública de los países en desarrollo, especialmente de los africanos, deberían considerar el EE como un problema obstétrico de gran relevancia en el contexto de la morbilidad materna.

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