

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

6,900

Open access books available

186,000

International authors and editors

200M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Management and Outcome of Ectopic Pregnancy in Developing Countries

Buowari Yvonne Dabota

*Medical Women Association Of Nigeria, Rivers State Branch
Nigeria*

1. Introduction

Ectopic pregnancy is a common life-threatening emergency in the developing world and its frequency is still high. Ectopic pregnancy is the commonest cause of maternal morbidity and mortality in the first trimester of pregnancy (Airede & Ekele 2005, Grimes 1994, Okunlola et al 2006). Complications of early pregnancy are common clinical conditions that often require emergency care. The patient may or may not be aware that she is pregnant at the time of evaluation at the emergency department (Complications of pregnancy, 2007). Diagnosis is frequently missed and should be considered in any woman in the reproductive age group presenting with abdominal pain or vaginal bleeding especially when combined with an episode of collapse or syncope. Ectopic pregnancy is a complication of pregnancy in which the products of conception develop outside the uterine cavity. With rare exceptions, ectopic pregnancies are not viable. By far the commonest site is the fallopian tube (Hanretty, 2004). It is a tragedy of reproduction and a form of reproductive failure in the index pregnancy of affected women. Such women have a 7-15% chance of recurrence and only 40-60% chance of conceiving after surgery (Aboyaji et al, 2002). Ectopic pregnancy remains a major gynaecological problem in contemporary gynaecological practice. Not only do women die from this disease but also of greater clinical importance is the indirect morbidity of poor fertility prognosis and adverse outcome in subsequent pregnancies (Musa et al, 2009). Ectopic pregnancy may not necessarily be managed by a gynaecologist especially in hospitals in rural settings where there are no specialist doctors or if present are limited in number. In such district hospitals, general practitioners with surgical and gynaecological skills manage them in low-income countries where most patients present late as emergencies.

Gynaecological emergencies form a large proportion of the workload of a gynaecologist. Gynaecological emergencies, diagnosis, and treatment have progressed in the light of evidence-based medicine combined with a good clinical assessment. This allows for appropriate management. Any primary health care doctor should be prepared to encounter and to handle gynaecological emergencies in patients even those in critical ill states. Ectopic pregnancy is a condition that occurs in all races, in all countries and in any socio-economic class of women during the reproductive years. It is a life threatening surgical gynaecological emergency in our environment (Nwagha et al 2007, Adesiyun et al 2001). Whilst there are many conditions that may lead to an emergency presentation, there are four emergencies, which account for the great majority. These are spontaneous abortion, pelvis sepsis

including bartholin's abscess, ectopic pregnancy, and accidents to an ovarian cyst. These common conditions should be at the forefront of the doctors' mind when asked to see a patient presenting as a gynaecological emergency whether she is referred by her general practitioner or presents herself to the casualty department. It is only when these diagnosis have been excluded should one consider alternative less common gynaecological emergencies.

Ectopic pregnancy presents a major health problem for women of childbearing age. If not treated vigorously and early enough, it may be fatal. It is of immense concern to reproductive health and it is associated with significant maternal morbidity and mortality and is fatal to the embryo. The future reproductive potential of the woman after an ectopic pregnancy is compromised. Ectopic pregnancy accounts for 73 % of early pregnancy mortalities. Ectopic pregnancy is derived from the Greek word 'Ekpos' meaning out of place and it refers to implantation of a fertilised egg in a location outside of the uterine cavity. In many parts of the world, there has been a dramatic increase in the incidence over recent decades with studies showing at least a doubling of the rate (Rajkhowa et al, 2000). Ectopic pregnancy is one of the most critical and life threatening emergencies in gynaecological practice (Olawaju, 1994). It is also known as extra uterine pregnancy.

Sites where an ectopic pregnancy can occur are the fallopian tube which is the commonest site, ovary, cervix, and the abdomen. When it occurs in the fallopian tube, it is known as tubal pregnancy. Implantation can occur at any point along the tube, although the ampulla is the commonest site. The isthmus is the next in frequency and the interstitial portion least common. While interstitial pregnancies represent a small fraction of ectopic gestations, they are especially feared due to their devastating outcomes (Fisch et al, 1998). Ectopic pregnancies that involves implantation in the cervix, the interstitial portion of the fallopian tube, the ovary, the abdomen or a scar from a caesarean section account for less than 10 % of all ectopic pregnancies. These unusual ectopic pregnancies are difficult to diagnose and are associated with high morbidity (Barnhart, 2009). The risk of recurrence of ectopic pregnancy is approximately 10% among women with 1 previous ectopic pregnancy and at least 25% among women with 2 or more previous ectopic pregnancies. Women in whom the affected fallopian tube has been removed are at increased risk for ectopic pregnancy in the remaining tube. Case series have suggested that approximately 60% of women who receive a diagnosis of an ectopic pregnancy are subsequently able to have an intrauterine pregnancy (Barnhart, 2009). Ipsilateral ectopic pregnancy occurs rarely and may be difficult to diagnose in low resource settings where there are no diagnostic tools. Few cases have been reported (Faleyimu, 2008). When the ectopic pregnancy is located in the abdomen, it is known as abdominal pregnancy. Patient with ectopic pregnancies are widely reported to be of low parity (Onwuhufua et al, 2001, Abdul, 1999, Baffoe & Nkyekyer, 1991). In a study in Benin city, Nigeria, majority of the patients with ectopic pregnancies were nulliparous and in their mid twenties (Gharoro & Igbafe, 2002). It remains a major challenge to the reproductive performance of women worldwide. The abnormally implanted gestation grows and draws its blood supply from the site of abnormal implantation. As the gestation enlarges, it creates the potential for organ rupture because only the uterine cavity is designed to expand and accommodate foetal development. Ectopic pregnancy can lead to massive haemorrhage, infertility, or death. Of all ectopic pregnancies, 97 % occur in the fallopian tube. Of all tubal pregnancies, 55 % are at the ampulla, 25 % at the isthmus, and 17 % at the fimbria (Complications of pregnancy, 2007). In rare cases of ectopic pregnancy, there may be two fertilized eggs one outside the uterus and the other inside. This is called heterotopic

pregnancy. Often the intrauterine pregnancy is discovered later than the ectopic pregnancy mainly because of the painful emergency nature of the ectopic pregnancies. The ectopic pregnancies are normally discovered and removed early in the pregnancy. Naturally occurring heterotopic pregnancy is rare (Odewale & Afolabi, 2008). Heterotopic pregnancy is on the increase because of increasing incidence of ectopic pregnancy. Heterotopic pregnancy is associated with a high maternal morbidity and foetal loss. This is probably due to delayed diagnosis resulting from confusing clinical features especially when diagnostic facilities are not available.

The importance of ectopic pregnancy in our environment is peculiar because rather than join the global trend of early diagnosis and conservative approach in management, we are challenged by late presentations with rupture in more than 80% in most cases (Igbarese et al, 2005). We are also challenged by poor diagnostic tools, limited capacity to handle emergencies and consequent burden of increased maternal morbidity and mortality and consequent reproductive failure (Udigwe et al, 2010).

The ectopic pregnancy may be ruptured or unruptured at the time of diagnosis. The unruptured variety may be intact or the slowly leaking type. The rupture can occur early in the gestation and a delay in diagnosis, potentially limits conservative treatment option (Fylstra, 2002).

Cervical ectopic pregnancy is the implantation of a pregnancy in the endocervical canal (Leeman & Wendland, 2000). Interstitial pregnancies represent a small fraction of ectopic gestations; they are especially feared due to their often devastating outcomes. The standard treatment for interstitial pregnancies have been laparotomy and cornual resection with hysterectomy required in many cases in order to control bleeding (Fisch et al, 1998). Interstitial implantation is rare but very dangerous because it ends in rupture of the uterine muscle.

Ipsilateral ectopic pregnancy occurs rarely and may be difficult to diagnose in low resource settings where there are no diagnostic tools (Bode-Law et al, 2008). Bode-law et al reported an ipsilateral ectopic pregnancy occurring in the stump of a previous ectopic site.

Heterotopic pregnancy is the simultaneous occurrence of an ectopic pregnancy with an intrauterine pregnancy. Assisted fertilization is a major risk factor for heterotopic pregnancy. Its presentation is similar to ectopic pregnancy with simultaneous evidence of an intrauterine pregnancy. Laparotomy is preformed to selectively remove the ectopic pregnancy. The intrauterine pregnancy survives to delivery in 66% of cases after treatment of the ectopic pregnancy (Wagner & Promes, 2007). Maternal deaths may occur and morbidity rates are high usually resulting from complications such as haemoperitoneum and peritonitis due to rupture of the extra uterine pregnancy site (Abedi et al, 2010). In 2008, Odewale and Afolabi in Nigeria published a report of heterotopic pregnancy, an ectopic pregnancy at the ampullary portion of the right fallopian tube and co-existent intrauterine pregnancy, which spontaneously aborted on the 10th postoperative day. Abasiattai et al reported a case of spontaneous heterotopic pregnancy with tubal rupture and delivery of a live baby at term (Abasiattai et al, 2010).

The implantation of a pregnancy within the scar of a previous caesarean delivery is the rarest form of ectopic pregnancy. Ibekwe in 2004 reported a case of ruptured ectopic pregnancy presenting as uterine rupture at 23 weeks. Mutihir and Nyango in 2010 reported a 34-year-old nullipara managed for ruptured ectopic pregnancy from endometriosis. This work was carried out at a general hospital located in a rural setting in northern Nigeria.

2. Incidence of ectopic pregnancy

There have been different hospital based studies in Nigeria and other developing countries on ectopic pregnancy. The incidence of ectopic pregnancy varies from country to country and within the same country, it varies from one community to another. In Nigeria, there are several private hospitals owned by individuals where patients can seek for medical treatment. Most Nigerian studies on ectopic pregnancies were carried out in the government owned hospitals; hence, this may not give a true picture of the incidence, as those in the private hospitals are not included. Also, some women may have died at home, as many people seek medical care late in Nigeria.

Some of these ectopic pregnancies may be terminated spontaneously before they give rise to notable clinical symptoms. There is currently an increased incidence of ectopic pregnancy globally. This incidence may be related to a higher incidence of tubal disease notably salpingitis. Other reasons for the rising incidence of ectopic pregnancy are adequate treatment for pelvic inflammatory disease, which in the past rendered women sterile. The use of intrauterine contraceptive device, increase in surgical procedures for tubal disease and improved diagnostic technique. The increase in the incidence of ectopic pregnancy is also associated with advances in assisted reproductive technology, tubal surgeries, and sterilizations and earlier diagnosis with more sensitive methods of cases that otherwise could have resolved without causing any symptoms (Arup et al, 2007). There is evidence that the overall incidence of ectopic pregnancy has been rising in many countries depending on the prevalence of risk factors and the methods of diagnosis available while the case fatality have been decreasing (Jurkovic, 2007, Morcau et al, 1995, Thonneau et al, 2002). Ectopic pregnancy is a global problem and has shown a rising incidence during the last three decades the world over (Arup et al, 2007). The incidence of recurrent ectopic pregnancy is approximately 15 % and this rises to 30 % following two previous ectopic pregnancies (Tulandi, 1988). A figure of 1 in 4000 to 7000 pregnancies is currently quoted for heterotopic gestation (Jurkovic, 2007). The incidence of a simple ectopic gestation varies from 1 in 300 pregnancies in Europe to as high as 1 in 20 to 50 pregnancies in Africa and West Indies (Piam & Otubu, 2006). Only a few reports of heterotopic pregnancy are reported (Aliyu et al, 2008, DeVoe & Pratt, 1998). The once extremely rare condition of heterotopic pregnancy is now more common with the advent of in vitro fertilization and embryo transfer. It is 1-3 % of all pregnancies and 10-15% of all ectopic pregnancies following in vitro fertilization and embryo transfer (Aliyu et al, 2008).

Ectopic pregnancy occurs approximately in 1.5 to 2.0 of pregnancies and is potentially life threatening (Barnhart, 2009). Despite the continued increase in the incidence of ectopic pregnancy, the rate of death from ectopic pregnancy has declined in developed countries primarily because of earlier diagnosis before tubal rupture. The incidence of ectopic pregnancy depends on the population studied and ranges from 1 % in rural general practice to 13 % in urban emergency department (Kaplan et al, 1996, Erondur et al, 2010).

The incidence of ectopic pregnancy in western countries has generally shown a rising trend with a decreased mortality mainly because of availability of modern diagnostic methods, which makes early diagnosis before tubal rupture, occurs in over 70 % of cases (Rajkhowa et al, 2000). The incidence of ectopic pregnancy was found to be 2.0 % in France (Coste et al, 1994), 2.8 % in Finland (Markinen, 1993) and 2.2 % in the United States (CDC, 1992). Another study over an 18-year period in America reported a rising incidence from 0.45 % to 1.68 % (Ory, 1992). It was reported to 1.24% in England (Rajkhowa et al, 2000). In most of Europe

and North America, the incidence of ectopic pregnancy is estimated at 2 % of livebirths (Moore et al, 2000). A study in Norway found out that the incidence of ectopic pregnancy in that country increased from 1.4% to 2.2% of livebirths between 1976 and 1993 (Bergsjø et al, 1990). In England and Wales, the incidence of ectopic pregnancy increased by five times between 1966 and 1996 from 0.3% to 1.6% of livebirths (Rajkhowa et al, 2000). The incidence also increased from 1.9 % to 2.3 % of livebirths between 1981 and 1991 in the United States (Berg, 1999). In another study conducted in the United States, the annual incidence of ectopic pregnancy increased from 0.37 % of pregnancies in 1948 to 1.97 in 1992 (Lipscomb et al, 2000). At the Royal Commission Medical Centre, Yanbe Industrial city in the Kingdom of Saudi Arabia the incidence between 2005 to 2008 was found to be 1 in 171 deliveries that is 0.58 % (Aziz et al, 2011). In India, the incidence of ectopic pregnancy is 1 in 161 (0.6%) deliveries (Arup et al, 2007).

In recent decades majority of methodological limitations in various African published literature make it impossible to draw formal conclusions concerning the incidence of ectopic pregnancy in Africa (Goyaux et al, 2003). In African developing countries, a majority of hospital-based studies have reported ectopic pregnancy case fatality rates of around 1-3 %, ten times higher than that reported in industrialised countries (Goyaux et al, 2003). Late presentation to a health facility, late diagnosis leading in almost all cases to majority of complications and emergency surgical treatment are the key factors accounting for such high fatality rates in women suffering from ectopic pregnancy in Africa. The incidence of ectopic pregnancy was found to be 0.79% in Yaoundé, Cameroun (Leke et al, 2004). This value may be considered a minimum due to probably underestimation. Nevertheless, this rate is lower than currently observed in industrialised countries. Late diagnosis, low percentage of conservative treatment and subsequent maternal deaths are important findings that should encourage African gynaecologists to promote ectopic pregnancy prevention programs and to improve the care given to women with ectopic prevention. The case fatality rate of ectopic pregnancy in Ghana was found to be 27.9/ 1000 (Baffoe & Nkyekyer, 1999). A study conducted in 1992 and 1993 at the Umtata General Hospital in Transkei, South Africa reported an ectopic incidence of 1.1% (Amoko et al, 1995). Between 1993 to 1995, the hospital based ectopic pregnancy incidence at Nosy Be Hospital, Madagascar was 2.9 % (Ratinahirana et al, 1997). It was 4 % at the gynaecology and obstetrics clinic of the national teaching hospital in Cotonou republic of Benin (Perrin et al, 1997). In Gabon University Medical Centre, Libreville it doubled between 1977 and 1989 from 1 % to 2.3 % (Picaud et al, 1990). At Yaoundé University Teaching Hospital, Cameroon, the incidence of ectopic pregnancy increased from 0.9% to 1.7 % between 1984 and 1992 (Kouam et al, 1996). The incidence of ectopic pregnancy increased in two maternities in Conakry at the Donka and Ignace Dean University Hospital, Guinea from 0.41 % to 1.5 % from 1995-1999 (Thoneau et al, 2002).

In Nigeria, an incidence of 1:287 deliveries or 0.35 % (Egwuatu & Ozumba, 1987) and 1:43 deliveries or 2.31% (Oronsange & Odiase, 1984) were reported from two institutions. These incidences may probably be an underestimation as many cases are managed in private hospitals and are not reported. A study by Oloyede et al in Sagamu, Nigeria over a 12-year review reported an incidence by 3.1% or 1 in 32 of all births (Oloyede et al, 2002). Ectopic pregnancy is an important cause of maternal death in Nigeria and in other developing countries. In Lagos, Nigeria, ectopic pregnancy was found to be responsible for 8.6 % of maternal deaths and had a case fatality rate of 3.7%. An incidence of 23.1 / 1000 deliveries was reported and ectopic pregnancy was found to be responsible for 48.5 % of

gynaecological emergencies (Anorlu et al, 2005). In another study in the same Lagos, Nigeria, it was responsible for 30 % of emergency gynaecological admissions with a case fatality rate of 3.7 % (Abudu, 1999). It was also found to be responsible for 8.6% of maternal deaths in Lagos, Nigeria (Abudu & Olatunji, 1996). Data obtained from various studies from different parts of Nigeria, showed that the perceived lower prevalence of chronic pelvic inflammation in the northern part of Nigeria might explain the comparatively lower incidence of ruptured tubal pregnancy (Essel et al, 1980). The incidence of ectopic pregnancy in two cities in northern Nigeria is 18.1 / 1000 deliveries in Sokoto (Airedo & Ekele, 2005) and 1.14 % in Zaria (Adesiyun et al, 2001). It is 1.7% in Jos (Olaewaju et al, 1994) and 1.68 % in Benin City, Nigeria (Gharoro & Igbafe, 2002). A previous study on ectopic pregnancy done at Benin City, Nigeria revealed an incidence of 3.5 % of the total hospital births. In Markudi, Nigeria, ruptured tubal pregnancy of 0.87 % accounted for foetal births and 94.6 % of all ectopic pregnancies. There is a rising trend in the incidence of ruptured tubal pregnancy from 0.65 % in 2004 to 1.09 % in 2006 (Jogo & Swende, 2008). At the Nnamdi Azikiwe Teaching Hospital in southern Nigeria, ectopic pregnancy was responsible for 6.5 % of gynaecological admissions with an incidence of 1.3 % (Udigwe et al, 2010), 3.30 per 100 deliveries in Calabar (Ekanem et al, 2009). It increased from 0.4 % to 1.7 % between 1977 to 1987 at the Obafemi Awolowo University Teaching Hospital, Ile-Ife (Makinde & Ogunnniyi, 1990). While it decreased at the University of Nigeria Teaching Hospital, Enugu between 1978 to 1981 to 0.53 % to 0.21% of deliveries (Egwuatu & Ozumba, 1987). These observations suggest that the incidence of ectopic pregnancy in developing countries especially on the African continent has probably increased in recent decades (Thoneau et al, 2002).

3. Risk factors

Multiple factors contribute to the relative risk of ectopic pregnancy although some patients may not have any risk factor yet developed ectopic pregnancy. In theory, any thing that hampers or delays the migration of the embryo to the endometrial cavity could predispose women to ectopic pregnancy. Age, marital status, and parity have been found not to be significant risk factors for ectopic pregnancy (Anorlu et al, 2005). The reported aetiological factors for ectopic pregnancy include pelvic inflammatory disease, post abortion sepsis, postpartum sepsis, previous ectopic pregnancy, reversal of previous tubal sterilization, tubal spasm, long defects of the fallopian tubes and psychological and emotional factors (Doyle et al, 1991).

Pelvic inflammatory disease: Pelvic inflammatory disease from inappropriate obstetric care or from unsafe abortion is a risk factor for ectopic pregnancy (Onwuhafua et al, 2001). These infection causes distortion in the genital tract and the fallopian tube in particular. Unsafe abortion leads to post abortion sepsis. Induced abortion and sexually transmitted disease increases the risk four fold and nine-fold respectively (Anorlu et al, 2005). Also, multiple sexual partners predispose the patient to acquiring sexually transmitted disease. Pelvic inflammatory disease is a major risk factor for developing ectopic pregnancy in Nigeria (Olaewaju, 1994, Egwuatu & Ozumba, 1987). Induced abortion as a significant risk factor for ectopic pregnancy was not observed in studies from countries where abortion is legalised (Atrash et al, 1997). This is because qualified medical personnel carry it out under aseptically clean environment with sterile instruments. Biologically the adolescent is particularly at risk of sexually transmitted disease because the columnar epithelium, which is susceptible to *Chlamydia* and *gonococci* organism extends from the endocervical canal to

the ectocervix making it fully exposed to pathogens. Adolescents also lack immunity to certain pathogens. Early sexual debut may also lead to adolescent pregnancy which is often unwanted and which usually end up with induced abortion in unsafe places and in the hands of quacks. Late age of sexual debut on the other hand, significantly reduces the risk of ectopic pregnancy (Anorlu et al, 2005). In a study in France by Coste J et al, found that *Chlamydia trachomatis* seropositively appeared to be an important risk factor in the development of ectopic pregnancy. Pelvic inflammatory disease is a risk factor for ectopic pregnancy especially salpingitis. A case control study conducted showed that the risk of ectopic pregnancy was showed that the risk of ectopic pregnancy was increased four fold with induction of ovulation (Fernandez et al, 1991).

Assisted conception: Ectopic pregnancy is one of the recognised complications of in-vitro fertilization and embryo transfer (Okohue et al, 2010). Ectopic pregnancy can present following an in vitro fertilization procedures. A high index of suspicion is necessary even in cases with previous bilateral salpingectomies or easy embryo transfer.

Intrauterine contraceptive device (IUCD): The use of intrauterine contraceptive device increases the risk of developing an ectopic pregnancy almost four fold (Anorlu et al, 2005).

Previous history of ectopic pregnancy: Previous history of an ectopic pregnancy increases the risk for another ectopic pregnancy. The risk of recurrent ectopic pregnancy is 12-18 % (Jurkovic, 2007). Every woman with a previous ectopic pregnancy would be at a high risk of recurrence of another ectopic pregnancy. This should be excluded when a patient with a previous ectopic pregnancy presents in early pregnancy.

Tubal surgery: Scarring following tubal surgery causes anatomical abnormalities of the fallopian tube, which presents abnormal embryo transport increase the risk of ectopic pregnancy (Doyle et al, 1991).

Previous caesarean delivery: There has not been any evidence of increased risk of ectopic pregnancy related to previous caesarean section (Kendrick et al, 1996). However, there are reports of ectopic pregnancies implanting on previous caesarean section scars. Endometrial and myometrial disruptions or scarring can predispose to abdominal pregnancy implantation (Fylstra, 2002).

4. Research methodology

4.1 Study design

This is a prospective study carried out at General Hospital Aliero, Kebbi State, Nigeria from February 2006 to January 2007. General Hospital Aliero is a general hospital and a secondary health facility that was upgraded from a primary health centre. At the time of the study, the three doctors at the hospital were general practitioners with no specialist training in obstetrics and gynaecology. The hospital manages patients with various illnesses and cases requiring specialist care are referred to the nearest tertiary health facility. The hospital does not have a gynaecological ward therefore patients with gynaecological problems are admitted into the female medical ward and those who had surgeries are admitted into the female surgical ward. The hospital is a general hospital, which does not have an active gynaecological unit as the patients are being managed by general practitioners posted to the hospital.

4.2 Study area

General hospital Aliero is located in Kebbi State of Nigeria. The capital of Kebbi State is Birnin Kebbi. The state was formed from part of the former Sokoto State in 1991. Kebbi State

is bordered by Sokoto State, Niger State, Dosso region in the Republic of Niger and the Nation of Benin. Kebbi state is traditionally considered to belong to the Banza Bakwai States of Hausa land. Kebbi State has the slogan 'Land of Equity'. At the time of the study, General Hospital Aliero is located in Aliero, which is the capital of Aliero Local Government Area. The study was conducted during the author's National Youth Service Corps at Kebbi State, Nigeria. National Youth Service Corps is a one-year compulsory posting of Nigerian graduates outside the area of their abode within the country to serve their fatherland for one year.

4.3 Study population

All patients managed for ectopic pregnancy during the study period were included in this study. The patients were admitted through the casualty department as they all presented as emergencies. Once a patient is diagnosed with ectopic pregnancy, blood sample was sent to the laboratory for haemoglobin estimation and whole blood is grouped and cross-matched against the patients' serum as blood products are not available at the centre. The patient is counselled for surgery and informed consent obtained. At presentation, a brief history was obtained and physical examination carried out for pallor, jaundice, cyanosis and any form of bleeding and pain. History of any previous ectopic pregnancy and tubal and pelvic infections are obtained. Including any previous treatment for pelvic inflammatory disease. Urinalysis is done and venous intravenous access established.

5. Results

During the period of study, 13 patients were managed for ectopic pregnancy making 8.23 % of gynaecological emergencies at the hospital. One hundred and fifty eight patients were managed for various gynaecological emergencies during the study period. The other gynaecological emergencies are spontaneous abortion, ovarian cyst, hydatidiform mole, and uterine fibroid. All the patients had a history of collapse at home before presenting in hospital. The age of patients ranged from 20 to 42 years with a mean of 25.12 years. All the patients were married and were accompanied by their spouses and family members to the hospital. Ten of the patients were nullipara, one primipara, and two Para three. All patients in the study have never been treated for pelvic inflammatory disease and none of them have used any form of contraception. Most of the women in the community prefer to have their babies at home with the assistance of a traditional birth attendant also known as traditional midwife. Some of these traditional birth attendants and traditional midwives have received some form of training. Therefore, it is difficult to calculate the incidence as per the number of deliveries.

Twelve patients presented with ruptured ectopic pregnancy. Only one patient had an unruptured ectopic pregnancy. All the patients had emergency exploratory laparotomy, as laparoscopic services are not available at the centre at the time of the study. Also, methotrexate was not available at the centre at the time of the study. The patients had an uneventful postoperative period and were discharged home with an advice to complete their course of antibiotics, analgesics, and haematinics. The twelve patients that presented with ruptured ectopic pregnancy received whole blood intra-operatively as blood products are not available at the centre. Findings at laparotomy were right fallopian tube ectopic pregnancy in eleven patients and two patients had left ampullary ectopic pregnancy. Salpingectomy was done for all the patients. There was no history of previous ectopic pregnancy in the patients. The patients were followed up until after discharge from hospital.

6. Clinical manifestations

There is no pelvic condition that gives rise to more diagnostic errors than ectopic pregnancy. There are no specific signs and symptoms that are pathognomonic but a condition of findings may be suggestive of an ectopic pregnancy. Therefore, there should be high index of suspicion all the time when symptoms of early pregnancy are followed by irregular vaginal bleeding, lower abdominal pain, tenderness, fainting attack, shoulder tip pain, signs and symptoms of massive blood loss and diarrhoea and vomiting. The signs and symptoms depend on the amount and pattern of bleeding. In slowly leaking ectopic pregnancy, the bleeding occurs slowly. A delayed period is followed by spotting to continuous bleeding and unilateral pelvic pain with an adnexal mass. Rupture is signalled by hypotension, marked tenderness and severe pain radiating to the shoulder. A ruptured ectopic pregnancy typically presents with abdominal pain and can be in hypovolaemic shock. Some patients may have a paradoxical bradycardia despite a large amount of blood loss. Syncope or collapse is also common. An unruptured ectopic pregnancy presents with abdominal pain with or without vagina bleeding (Wagner & Promes, 2007).

The clinical presentation of ectopic pregnancy depends on whether it has ruptured or not. Ruptured ectopic pregnancy presents usually from 6 to 12 weeks of pregnancy. Ruptured ectopic pregnancy can lead to massive haemorrhage and death. The presentation is variable. The combination of pain, vagina bleeding, and shock is the classical presentation of ruptured ectopic pregnancy. Some patients may have syncope attacks while others may just have a sudden excruciating abdominal pain. This may be associated with severe cardiovascular compromise.

Patients usually present with the ruptured variety with attendant peritoneal flooding and its clinical consequence unlike the situation in the developed countries where up to 75 % are unruptured (Kouam et al, 1996, Morcau et al, 1995). This is because they present early to a health facility. Ectopic pregnancy has a protean manifestation (Ilesanmi & Shobowale, 1992). The delayed diagnosis of ruptured ectopic pregnancy is an important cause of death in women (Fowler, 2006). A dilemma may arise when there is a properly and reliable diagnosis of ectopic pregnancy with a live foetus. Nevertheless, the magnitude of complications of ruptured ectopic gestation is enormous. Delaying the patient of an a reliable diagnosis of ectopic pregnancy to a time of rupture or imminent rupture in order to justify not tampering with life may be considered unethical and illegal (Dickens et al, 2003).

Abdominal pain: Patients with ectopic pregnancy may have abdominal pain. This may be sharp or sudden tearing pain in the patient with ruptured ectopic pregnancy. It may start in any of the flanks or iliac fossa depending on the affected fallopian tube if the ectopic pregnancy is implanted in the fallopian tube. This gradually moves towards the umbilical region and becoming generalised. When it is an unruptured ectopic pregnancy, or slowly leaking, the abdominal pain is dull and continuous. Depending on the intensity of the pain, some patients may seek medical attention now. Ectopic pregnancy can lead to massive haemorrhage or death. It mimics virtually every condition that causes acute abdomen in women of the reproductive age group (Kigbu et al, 2006). Abdominal pain is the commonest symptom of ectopic pregnancy. The pain may be present even prior to rupture. When there is a rupture, the pain becomes sudden with each bleeding continuous and extensive intraperitoneal bleeding, the pain becomes generalized because of irritation of the diaphragm by the haemoperitoneum can cause shoulder tip pain. The abdominal pain is caused by distension of the gravid tube, by its efforts to contract and expel the ovum and by irritation of the peritoneum by leakage of blood.

Shoulder tip pain: Some patients present with shoulder tip pain. There is extensive intraperitoneal bleeding with irritation of the diaphragm by the haemoperitoneum causing irritation of the phrenic nerve.

Vagina bleeding: There may be vagina bleeding with passage of decidua cast.

Amenorrhea: This is evidence that the woman is pregnant

Dizziness and weakness: This is due to the ongoing peritoneal haemorrhage.

Nausea and vomiting: This is not specific to ectopic pregnancy. It is due to irritation of the bowel causing negative peristalsis.

Fever: It is not common and is due to irritation of the peritoneum by blood. There may be other concurrent infections and infestations such as malaria in malaria endemic areas.

The classic triad of amenorrhea, irregular vaginal bleeding and abdominal pain is not always present and occurs usually at more advanced gestational age and in patients in whom ectopic pregnancy has ruptured. In unruptured or slowly leaking ectopic pregnancy, the patient may be haemodynamically stable. A stable patient may have ill-defined abdominal pain and amenorrhea. A stable patient with ectopic may suddenly rupture and decompensate. It is because as the gestation enlarges, it creates the potential for organ rupture because only the uterine cavity is designed to expand and accommodate foetal development. The clinical manifestations in slowly leaking ectopic pregnancy are on and off lower abdominal pain, amenorrhea, irregular scanty vaginal bleeding, and with or without spells of dizziness. In unruptured ectopic pregnancy, the clinical manifestations are stable haemodynamic state, lower abdominal pain, amenorrhoea, may be symptomless and diagnosis aided by ancillary diagnostic tests.

7. Clinical findings

Evidence of blood loss: There will be evidence of blood loss. Rapid pulse rate, pallor, and reduced blood level. In severe haemorrhage, there is be hypotension.

Shock / syncope: This is a clinical manifestation of ruptured ectopic pregnancy. Any female in the reproductive age group with a history of collapse without any trauma should be considered to have ectopic pregnancy until proven otherwise. The collapse is due to massive haemorrhage from the rupture with massive haemoperitoneum. The fainting attack is due to blood loss and weakness. The syncope can sometimes coincide with the rupture. The shock is due to hypovolaemic shock due to haemoperitoneum. It is due to circulating failure from reduction in effective circulating blood volume. There will be clinical features of shock such as tachycardia, hypotension, oliguria and occasionally bradycardia, pallor, sweating, confusion, cold, and clammy peripheries. There is inadequate left ventricular preload, significant fall in cardiac output, low central venous pressure and decreased urine output. Further haemorrhage results in decreased cardiac out, sympathetic over activity, further reduction in tissue perfusion, worsening hypoxia, cellular damage, and release of inflammatory cytokines. Decrease in the intravascular blood volume leads to decrease in cardiac output and tissue perfusion. Also, the decrease in intravascular blood volume causes diversion of blood from the skin to maintain organ perfusion giving rise to pale cool skin, hypotension, and tachycardia. Blood is diverted preferentially to the heart and brain. Therefore, thirst, oliguria, tachycardia, and labile blood pressure occurs. Reduced blood flow to the brain and heart results in restlessness, agitated, confusion, hypotension, tachycardia, and tachypnea.

Pelvic examination: It may be difficult to define the uterus because of pain. There is severe cervical tenderness in the presence of pelvic inflammatory disease. The pouch of Douglas is full. There may be identification of a pelvic mass separate from the uterus.

Haematosalpinx: This is due to accumulation of blood in the fallopian tube.

Haematocele: This is due to progressive bleeding with haematoma formation in the pouch of Douglas (Coutrin et al, 2007).

Haematoperitoneum: Bloody perfusion into the peritoneal cavity secondary to rupture of the fallopian tube and its blood vessels (Coutrin et al, 2007). This is the clinical picture seen most commonly in rural areas.

8. Management of ectopic pregnancy

In managing ectopic pregnancy, there is the need for a high index of suspicion (Ibekwe, 2004). Investigations must not delay resuscitation. The initial management of the acute patient involves correction of shock with rapid fluid replacement, cross matching of blood, check on the haemoglobin and immediate recourse to laparotomy to stem the source of the haemorrhage (Pitkin et al, 2003).

8.1 Investigations

Haemoglobin estimation: There is a drop in the haemoglobin level. Also, there is a gradual drop if serial haemoglobin estimation is done in ruptured or slowly leaking ectopic pregnancy. The haemoglobin level in an unruptured ectopic pregnancy may not give a clue to the condition.

Pregnancy test: This measures the human chorionic gonadotrophin level. A negative test does not exclude an ectopic pregnancy. Ectopic pregnancy does not produce as much human chorionic gonadotrophin as much as intrauterine pregnancy. A pregnancy test is only valuable if it is positive (Coutin et al, 2007).

Ultrasonography: Diagnostic ultrasound also referred to as sonography is the method of imaging structures inside the body by using high frequency sound waves with no ionizing radiation involved. Ultrasound is safe and non-invasive. In ectopic pregnancy, pelvic ultrasound shows an empty uterus and an ectopic gestation sac with a living embryo if the ectopic pregnancy has not ruptured. There is fluid in the cul-de-sac of the perineum. Real time ultrasound shows foetal heart motion. Real time ultrasonography is of great help in establishing the diagnosis of unruptured ectopic pregnancy. Its primary role lies in documenting a normal intrauterine pregnancy about five to six weeks of gestation. Such a finding essentially excludes the possibility of ectopic pregnancy because the incidence of coexisting ectopic pregnancy and intrauterine pregnancy is about 1 in 30,000 pregnancies. Ultrasound examination may be of secondary importance in supporting a diagnosis of possible ectopic pregnancy by showing an adnexa mass or fluid within the cul-de-sac or both. The ability to identify an adnexa mass as an ectopic pregnancy rather than a large ovarian cyst, hydrosalpinx, tubo-ovarian abscess or other causes of adnexa enlargement varies from centre to centre. Ultrasonography has been found to be promising in the confirmatory diagnosis of ectopic pregnancy (Ikpeze, 1991). Use of ultrasonographic imaging should never preclude adequate resuscitation or definitive surgical therapy in a patient who is haemodynamically unstable and in whom ectopic pregnancy is a highly suspected. The goal of bedside ultrasonography is to diagnose an intrauterine pregnancy as heterotopic pregnancy although rarely still occurs. Bedside ultrasonography should not be

performed if it delays resuscitation or definitive surgical care in an unstable patient. Transvaginal sonography facilities diagnose the location of the gestational sac, age, size, and viability of an ectopic pregnancy even within a uterine scar (Herman et al, 1995). Bedside ultrasonography is the test of choice in unstable patients. Ectopic pregnancy within a previous caesarean section scar is best diagnosed by transvaginal ultrasound. However, a delay in either diagnosis or treatment can lead to uterine rupture, hysterectomy, and significant maternal mortality. As soon as the diagnosis is confirmed, proper surgical treatment by laparotomy should be arranged. Ultrasound evaluation especially transvaginal scan is invaluable but where the result is equivocal, ancillary tests should be done (Tenore, 2000). The ultrasonographic findings of a ruptured ectopic pregnancy are absence of an intrauterine gestational sac, fluid particularly haemorrhagic in the pelvis or perineum, adnexal masses or haematosalpinx. Transvaginal ultrasound provides improved resolution allowing descriptions of early embryonic development characteristics. Improvement in the identification of the sonographic landmark of normal embryonic development and awareness of the sonographic risk factors of pregnancy failure may lead to more successful management strategies. Diagnosis of suspected ectopic pregnancy often involves an assessment of both hormonal markers and sonographic features (Lucie et al, 2005). Ultrasound that demonstrates an intrauterine pregnancy is reassuring because heterotopic pregnancy occurs in only 1: 7000 to 1: 30,000 of spontaneously conceived pregnancies (DeVoe & Pratt, 1948). The sonographic appearance of an ectopic pregnancy is varied. There may be simple adnexal cyst, complex adnexal mass, tubal ring, free fluid in the adnexal cul-de-sac, a live extra uterine foetus or an empty uterus with no other sonographic findings (Lucie et al, 2005). A live extra uterine embryo is diagnostic of an ectopic pregnancy. Isolated free fluid in the pelvis is rarely the only sonographic findings. Presence of an adnexal mass and / or free pelvic fluid is strong predictor of an ectopic pregnancy (diagnostic imaging). Where ultrasound is not available and there is still some doubt, two other diagnostic procedures can be used. They are culdocentesis, which is puncture of the pouch of Douglas and abdominis parentesis.

Culdocentesis: This involves aspiration of fluid from the pouch of Douglas through the posterior fornix of the vagina.

Parentesis abdominis: This involves aspiration of non-clotting blood from the abdomen. It is not diagnostic because the needle used for aspiration can go into the inferior vena cava, or rectum. It is technically difficult in the obese patient. The pouch of Douglas may be full. There can be adhesions therefore the needle may not get to the abdomen.

8.2 Resuscitation

Volume replacement is done with plasma expanders and preparations for the definitive therapy. In developing countries and low resource settings, colloids are not readily available. In severe anaemia, blood transfusion is commenced before surgery. In ruptured ectopic pregnancy, intravenous access is established with a wide bore cannula and rapid infusion of a plasma expander done if the patient is in shock or in the presence of hypotension. If there is evidence of haemoperitoneum with clinical shock following rupture, there is little room for delay. Blood sample is collected for haemoglobin estimation, grouping, and crossmatching of at least two units of blood. Occasionally a delay in red blood cell transfusion poses a substantial risk to the patient. In these circumstances, transfusion with non-crossmatched type O rhesus negative blood may be necessary. The

disadvantages of using non-cross matched blood include possible transfusion of incompatible blood owing to clinically significant antibodies to blood groups other than ABO.

8.3 Treatment

Ectopic pregnancy can be treated surgically or non-surgically depending if it is ruptured or not and the equipments available at the centre. Due to advances in the diagnostic techniques, it has become possible to identify and manage ectopic pregnancy before they cause clinical symptoms in many developed countries. (Amok & Buga, 1995). This is not so in most developing countries. Subsequent fertility is substantially improved when conservative surgery is utilised instead of salpingectomy. Subsequent intrauterine pregnancy rates have been found to be 76% when conservative surgery is performed and 44% when salpingectomy is performed (Sherman et al, 1982). In patients with adhesive disease in the contra-lateral adnexa and a history of infertility, conservative management of ectopic pregnancy has produced good results with restoration of tubal potency in over 80 % in some cases if the ectopic pregnancy has not ruptured (Rajkhowa et al, 2000, Ekele, 2001, Lipscomb et al, 2000). The management of ectopic pregnancy has been improved upon by the use of ultrasound, laparoscopy, and monitoring of the beta subunit of the Human Chorionic Gonadotrophin (Gracia & Barnhan, 2001). Early diagnosis before tubal rupture is important in reducing mortality as well as preserving the potential for future fertility through conservative management (Gazvani, 1996). If not treated vigorously and early enough, ectopic pregnancy may be fatal. Women with ectopic pregnancy continue to present late precluding early diagnosis and use of conservative modalities of management. Morbidity remains high but mortality has declined. Blood bank services and availability of antibiotics are necessary in the management of most gynaecological emergencies. This is a problem in some developing countries and sometimes absent in some hospitals in rural areas. Transportation to an appropriate health facility can be a cause of late presentation.

8.3.1 Surgical therapy

Surgical treatment of ectopic pregnancy can be by laparotomy or minimally invasive surgery that is laparoscopy. Laparotomy involves removing the affected fallopian tube (salpingectomy) or dissecting the ectopic pregnancy with conservation of the fallopian known as salpingostomy. Laparotomy is reserved for patients with extensive intraperitoneal bleeding, intravascular collapse, or poor visualisation of the pelvis at the time of laparoscopy. The decision to perform a salpingostomy or salpingectomy is often made intra-operatively based on the extent of damage to the affected and contra-lateral tubes but it is also dependent on the patient's history of previous ectopic pregnancy and wish for future fertility, availability of assisted reproductive technology and the skill of the surgeon (Barnhart, 2009). Most gynaecological emergencies that are managed by laparotomy can be treated by laparoscopy and benefit both patient and the health facility (Baumann et al, 1989). Not all cases of ectopic pregnancy can be treated with laparoscopy especially ruptured ectopic pregnancy. The treatment of ectopic pregnancy is influenced by the clinical state of the patient, the site of the ectopic gestation, the reproductive wish of the patient and available facilities and technology. Surgical treatment for ectopic pregnancy is still the norm and gold standard. The surgical procedure may also be radical (salpingectomy) or conservative (linear salpingostomy). In the surgical management of ectopic pregnancy, the

benefits of salpingectomy over salpingostomy are uncertain (Farquhar, 2005). In developed countries, most ectopic pregnancies are diagnosed before rupture and there is room for conservative surgical procedures (Ibekwe, 2004). The emphasis in the management of ectopic pregnancy is on early diagnosis before rupture and conservative surgery. However, in most developing countries especially Nigeria where patients still present late after rupture, salpingectomy remains the operative procedure (Ibekwe, 2004). Salpingectomy is the commonest surgical management for tubal pregnancy in Nigeria because most of the women present late (Egwuatu & Ozumba, 1987, Gharoro & Igbafe, 2002). Salpingectomy, which leads to tubal loss and reduced reproductive potentials is the commonest management option in low resource settings (Eze, 2008). Intrauterine pregnancy rate after salpingectomy is about 45 % with a 9 % repeat ectopic pregnancy (Eze, 2008). In salpingostomy, tissue handling is minimized to reduce tissue trauma and prevent tubal occlusion or peritubal adhesions. The success of reconstructive tubal surgery for ectopic pregnancy can be only measured in terms of subsequent live births the individual achieves. During the surgical treatment of ectopic pregnancy by both laparotomy and laparoscopy, the state of the contra-lateral tube is noted. The condition of the contra-lateral tube has been reported to play a crucial role in subsequent fertility of patients with ectopic pregnancy (Kjellberg & Lalos, 2000, Tuomivaara & Kauppila, 1988). An ectopic pregnancy with a ruptured or severely damaged tube renders little choice but salpingectomy (Nannie et al, 2003). Salpingostomy is where the ectopic conceptus is removed from the affected tube through a linear incision of the tube overlying the ectopic pregnancy. This incision is not surgically closed and is allowed to heal through secondary intention. This surgical treatment conserves the affected tube (Varma & Gupta, 2008).

8.3.1.1 Ectopic pregnancy in caesarean section scar

Although the expedient and medical management have been reported, termination of a caesarean section scar pregnancy by laparotomy and hysterectomy with repair of the accompanying uterine scar dehiscence may be the best option (Fylstra, 2002).

8.3.2 Laparoscopy

This service is not readily available in developing countries especially those in low resource areas and in underequipped hospitals. Elsewhere in the developed world, minimal access laparoscopic surgery has become the preferred technique unless the woman is haemodynamically unstable (Tulandi & Saleh, 1997). Laparoscopic surgery has brought a lot of revolution in the field of medicine. Its evolution and spread was rapid in developed countries. In the industrialized countries, it is often the first choice intervention when surgery is needed. However, there is still a major gap in the implementation of laparoscopic surgery in under resourced settings often due to restricted availability to access to the equipment and lack of training. Laparoscopic surgery compared to open surgery may offer advantages such as less infections, complications, minimal tissue trauma, faster recovery, and shorter stay in hospital. Its implementation is associated with some constraints such as the surgeons' skills, the cost of acquisition and maintenance of the laparoscope, need for a trained anaesthetist, the availability of electricity and medical carbon dioxide.

Diagnostic and therapeutic laparoscopy has increased over the last decade without increase in maternal and foetal complications. Laparoscopic approach is useful for haemodynamically stable patients. The choice of laparoscopic surgery versus laparotomy

depends on the clinical experience of the surgeon, equipment availability, and patients' physical status (Ling & Stovall, 1994). In women desiring fertility, conservative tube sparing surgery has been recommended, as it does not increase the subsequent recurrence of ectopic pregnancy (Arora et al, 2005). Salpingectomy is the procedure of choice if the woman has no desire for future pregnancy. Laparoscopic management of ectopic pregnancy has been demonstrated to be safe and an effective alternative to conventional management by laparotomy. Laparoscopic procedures are associated with less intra-operative blood loss, lower analgesic requirements, shorter hospital stay and a quicker return to normal activities (Qureshi et al, 2006). Experienced operators may be able to manage laparoscopically women with even large haemoperitoneum safely but the surgical procedure, which prevents further loss quickly should be used (Guideline: 2004). In most centres, this will be by laparotomy. A pregnancy ectopically implanted into the fallopian tube, ovary or other distant sites may also be associated with the accumulation of fluid in the uterine lumen at five weeks gestation. This absence of a chorionic sac however leads to the appearance of only a single ring or pseudo sac in the uterus, in contrast to the double ring of an intrauterine pregnancy. The identification of a cystic mass with complex shadows in the adnexa may give a further clue to the presence of an ectopic pregnancy although it is often impossible to determine the exact site of origin of such a mass on ultrasound. Finally, bleeding associated with ectopic pregnancy may manifest itself as free fluid in the pouch of Douglas (Loughney & Stirges, 2004). Ectopic pregnancy can occur in the absence of either a single uterine ring, an adnexa mass or free peritoneal fluid.

8.3.3 Medical treatment

Medical therapy has an established place in the treatment of ectopic pregnancy and in carefully selected patients; it appears to be effective as surgery (Sowter & Farquhar, 2004). For medical therapy of ectopic pregnancy, systemic methotrexate is usually employed. However, ultrasonographic or laparoscopic guide injection into the gestational sac can lead to resolution in asymptomatic patients. There are numerous reports describing successful treatment of all varieties of ectopic pregnancies using a number of methotrexate (MTX) regimens. It is clear that many women with an ectopic pregnancy are not suitable for medical therapy. Active intra-abdominal haemorrhage is a contraindication. The size of the mass is important. Medical therapy for ectopic pregnancy involves also monitoring the patients' quantitative beta human chorionic gonadotrophin concentrations and this is not available in low resource areas. Single dose methotrexate is associated with a higher risk of rupture than multiple doses (Buster & Barnhart, 2004). Medical management is indicated with no viable intrauterine pregnancy, absence of rupture, adnexal mass of 4 cm or less and beta Human Chorionic Gonadotrophin levels are below 10,000 iu/ml (Buster & Barnhart, 2004). Some of the side effects of methotrexate are abdominal discomfort, chills and fever, dizziness, immunosuppression, leucopenia, malaise, nausea, ulcerative stomatitis, photosensitivity and undue fatigue. Breastfeeding is an absolute contraindication to methotrexate therapy. Relative contraindications to methotrexate therapy are abnormal liver function test, blood dyscrasias, ongoing radiotherapy, excessive alcohol consumption, HIV / AIDS, psoriasis, rheumatoid arthritis and significant pulmonary disease. There is no role for medical management in the treatment of ruptured tubal pregnancy or suspected tubal pregnancy when a patient shows signs of hypovolaemic shock (Guideline, 2004).

8.4 Postoperative management

The patient may still require blood transfusion if anaemia is still present. Intravenous fluids are administered until bowel sounds return and the patient is able to take orally. Antibiotics and analgesics are administered. Haematinics is commenced once the patient has commenced oral feeding. The patient is encouraged to ambulate especially if obese. On discharge, the patient is counselled for family planning and follow-up. Follow-up visit is necessary. Broad-spectrum antibiotics are administered.

8.5 Blood transfusion

Blood transfusion involves the infusion of whole blood or blood component from one individual to another. In an emergency with massive blood loss that threatens life, it is permissible to transfuse group O negative packed cells but blood sample must be taken for grouping and crossmatching prior to transfusions (Simmons, 2008). Blood transfusion is associated with significant risk hence it calls for great caution. Transfusion safety lies on the avoidance of transfusion reaction. Blood transfusion services are necessary in the management of ectopic pregnancy because of the intraperitoneal haemorrhage. Some patients may present in haemorrhagic shock. Blood transfusion could be life saving in cases of ruptured ectopic pregnancy. Blood products are scarce resources in developing countries especially in low resource centres although blood transfusion carries its own risks. Transfusion of safe blood when life-threatening conditions cannot be prevented or managed by other means. Blood transfusion is just a part of clinical management. Blood loss can be massive requiring blood transfusion. Autologous blood transfusion is done in most rural centres. Blood from the intraperitoneal haemorrhage is scooped out and filtered through five to eight layers of sterile gauze to remove large blood clots. This filtered blood is introduced into a blood bag, which contains an anticoagulant to prevent clotting of the filtered blood, and transfused to the patient via blood giving set.

8.6 Patients who refuse blood transfusion

Even after extensive counselling regarding the risks and benefits of blood transfusion, some patients still refuse blood transfusion even under life threatening conditions. These are due to religious and traditional beliefs. Written informed consent concerning this issue should be obtained in the presence of a witness because if death of the patient occurs, the patient will no longer be there to attest herself. Initial management with intravenous fluids sufficient to maintain perfusion and haemodynamic stability should be commenced.

9. Discussion

Ectopic pregnancy is a cause of maternal morbidity and mortality and is reduced where there are emergency surgical facilities and blood transfusion services. All the patients in this study had laparotomy as in most studies conducted in Nigeria. This is because laparoscopic services are not available at the centre. Laparotomy for now remains the most common surgical intervention method at our disposal for the management of ectopic pregnancy. This is due in part to non-availability of operating laparoscopes, which have been shown to be very useful (Barnhart et al, 1980). Moreover, significant haemoperitoneum from ruptured tubal pregnancy makes laparoscopic surgery less than ideal. The doctors at the study centre do not have specialist training in obstetrics and gynaecology hence salpingectomy is done in

all patients diagnosed with ectopic pregnancy. Referral of a patient with ectopic pregnancy to a centre with laparoscopic service may lead to death during transportation and transfer because there is continuous intraperitoneal bleeding which can lead to exsanguination. Blood transfusion services are necessary in the management of ectopic pregnancy. Mortality and morbidity are low when diagnosis is made before rupture occurs. The most common cause of these deaths is massive bleeding after rupture of the ectopic pregnancy. Absence of cross-matched blood should not be a deferment to exploratory laparotomy because intraperitoneal haemorrhage is on going. In developed countries, diagnosis is made before rupture occurs however most cases in our environment still present late with severe intraperitoneal haemorrhage (Nwagha et al, 2007).

Early presentation, high index of suspicion and use of modern diagnostic techniques will improve overall clinical outcome in patients. Promotion of family planning, early treatment of pelvic inflammatory disease and good quality obstetric care could be important preventive intervention.

Abdominal pain and tenderness are the most frequent sign and symptom of ectopic pregnancy (Airede & Ekele, 2005). Diagnosis was usually based on clinical findings augmented by procedures such as paracentesis abdominis, abdominal and pelvic examination, and urine pregnancy test. Blood products are not available at the centre hence all the patients received transfusion of whole blood.

10. Case series

10.1 Case 1

A 24-year-old nullipara presented with complaints of abdominal pain and vaginal bleeding of one-week duration. The pain was cramp-like and sharp at the umbilicus. She had amenorrhea for six weeks. Physical examination revealed a young woman in painful distress that was very pale. Pulse rate was 120 beats per minute and blood pressure 90/60 mmhg. The abdomen was distended and tender. It was difficult to palpate abdominal organs because of guarding. Pelvic examination showed an uneffaced cervix, which was firm, tender, and central. Cervical Os was closed. The uterus was empty with free adnexa, full, tender, and cystic pouch of Douglas on pelvic examination. There was cervical excitation tenderness and the examining gloved finger was stained with altered blood. The packed cell volume was 22%. A diagnosis of ruptured ectopic pregnancy was made. Abdominal ultrasound showed a bulky uterus, which was anteverted. The endometrial cavity was empty and intact. There was significant decidual reaction suggestive of ruptured ectopic gestation. The entire pelvic organs was floating on fluid suggestive to be internal haemorrhage. Differential diagnosis of massive peritoneum, ascitis, very bulky uterus with decidual reaction and ruptured ectopic pregnancy was made. At laparotomy, there was seropurulent peritoneal fluid with a gangrenous 80 cm of the terminal ileum, gangrene of 10 cm of the sigmoid colon trapped in a sigmoid volvulus. The gangrenous segment of bowel was excised and resected with an ileo-ileal and colo-colic anastomosis done.

10.2 Case 2

A 30-year-old woman presented with complaints of six hours severe abdominal pain and eight weeks of amenorrhoea. Clinical findings showed tender right iliac fossa and lumbar region. She was in painful distress and pale. Cervical excitation tenderness was tender on

pelvic examination and tenderness of the right adnexa. Abdominal ultrasound suggested right ovarian cyst torsion. Laparotomy findings was a right ruptured ectopic pregnancy.

10.3 Case 3

32-year-old nullipara presented with complaints of bleeding altered blood per vaginum of four weeks duration with associated offensive discharge, abdominal pain of three weeks duration, generalized body weakness, abdominal swelling, two episodes of fainting attacks and vomiting of one-week duration. She never used any form of contraceptives and has had two terminations of pregnancies. On examination, she was pale with an unrecordable blood pressure at presentation. She was resuscitated with intravenous normal saline and the blood pressure became 100/ 60 mmhg. Abdomen was distended with guarding. The abdominal organs were difficult to palpate due to tenderness with the presence of ascitis evidenced by positive shifting dullness, the cervix was firm and uneffaced. Uterus was bulky and the left adnexa were bulky and tender on pelvic examination. The packed cell volume was 10 % with a positive pregnancy test. At laparotomy, there was haemoperitoneum of 3L with a right ruptured ampullary gestation with normal right ovary. Right partial salpingectomy was performed.

10.4 Case 4

A 26-year-old nulliparous undergraduate presented with six weeks of amenorrhea, fainting attacks, and severe abdominal pain. On examination, she was in shock with a fast and thready pulse and unrecordable blood pressure. She was resuscitated with 1.5 L of normal saline. Packed cell volume was 20%. Pelvic examination showed a bulky uterus with cervical excitation tenderness and full pouch of Douglas. A diagnosis of ruptured ectopic gestation was made. She was immediately planned for laparotomy. At laparotomy, there was haemoperitoneum of 3L with a ruptured left ovarian ectopic pregnancy. Left partial salpingectomy with left oophorectomy was performed. She received two units of blood intra-operatively and one unit of whole blood postoperatively.

10.5 Case 5

A 35-year-old Para two woman with one previous caesarean section was diagnosed to have slowly leaking ectopic pregnancy. She refused surgical intervention. After surfing the internet, she found out that ectopic pregnancy could be treated medically. Without finding out the criteria for medical therapy of ectopic pregnancy, she was able to obtain methotrexate on her own. One week later, she collapsed while at work and was rushed to a nearby hospital where emergency laparotomy and right salpingectomy for ruptured ectopic pregnancy was performed.

11. Prognosis

Ectopic pregnancy results in significant morbidity for the mother and inevitable loss of the pregnancy. Apart from foetal wastage, maternal morbidity and mortality occurs, ectopic pregnancy is also associated with repeat ectopic gestation and impairment of subsequent fertility (Abdul, 1999). The survival rate of ectopic pregnancy has improved with great improvements in anaesthesia, antibiotics, and blood transfusion. Maternal morbidity and mortality can be reduced with an early diagnosis of ectopic pregnancy. Early diagnosis before tubal rupture is important in reducing mortality as well as preserving the potential

for future fertility through conservative management (Gazvani, 1996). In many cases, early diagnosis allows a conservative approach resulting in a normal macroscopic appearance and thereby preserving tubal potency and function.

12. Conclusion

Ectopic means out of place. The egg settles in the fallopian tube in more than 95% of cases. This is why it is commonly called tubal pregnancy. The egg can also implant in the ovary, abdomen, or cervix. None of these areas has as much space for nurturing tissue as a uterus for a pregnancy to develop. As the foetus grows, it will eventually burst the organ that containing it causing severe bleeding and endanger the mothers' life.

Ectopic pregnancy remains the leading cause of maternal morbidity and mortality in the first trimester of pregnancy and is a significant cause of reproductive failure in Nigeria (Igberase et al, 2005). It remains a major public health challenge among women of the reproductive age group in this region. Community based comprehensive health education programme focusing on contraception, sex education, prevention and treatment of post abortal sepsis, pelvic inflammatory disease and puerperal sepsis are urgently needed. It continues to be an important contributor to maternal morbidity and mortality and early wastages in the first trimester of pregnancy in our environment mainly because of the late diagnosis because of seeking for medical help late with attendant risk of tubal rupture and haemorrhage (Igberase, 2005, Kora et al, 1996). A high prevalence of sexually transmitted infections and unsafe abortions results in a high incidence of ectopic pregnancy. Poverty, ignorance, late presentation, non-availability of modern diagnostic tools is the basis of significant improvement in the detection and prompt treatment of ectopic pregnancy in developing nations. Emphasis should be placed on prevention and early detection as to give patients the opportunities for tubal conservative treatment. The incidence of ruptured ectopic pregnancy is decreased in westernised and developed countries because of increased awareness of the disease condition, early referral and better techniques and diagnostic instruments such as quantitative beta human chorionic gonadotrophin and vagina ultrasound probe.

The importance of ectopic pregnancy in our environment is peculiar because rather than join the global trend of early diagnosis and conservative approach in management we are challenged by late presentations with rupture in more than eight percent in most of the cases (Gharoro & Igbafe, 2002).

Promotion of family planning, early and prompt treatment of pelvic inflammatory disease and good quality obstetric care could be important in preventive intervention measures (Adesiyun & Adze, 2001). The high incidence of ectopic pregnancy may be related to a higher incidences of tubal disease notably salpingitis. Technological advances have led to earlier diagnosis of ectopic pregnancy with a decline in morbidity and mortality in developed countries. Early presentation, high index of suspicion and use of modern diagnostic techniques will improve overall clinical outcome of patients. Considerable progresses have been accompanied in the diagnosis and treatment of ectopic pregnancy (Ayoubi & Fanchin, 2003). The combination of abdominal pain, vaginal bleeding, and shock is the classical presentation of ruptured ectopic pregnancy though the presentation can be varied. Although advances in earlier diagnosis have led to reduced case fatality rates and conservative laparoscopic treatments have enabled improved outcomes (Doyle et al, 1990). Ectopic pregnancy accounts for a sizable proportion of infertility and ectopic reoccurrence (Dolye et al, 1990). Health education of women in the reproductive age on safe sex and

eradication of unsafe abortion and early treatment of pelvic infections and good quality obstetric care will prove useful as preventive measures.

A high index of suspicion and up to date diagnostic methods, proper sex education, prevention of unwanted pregnancy, prevention and proper treatment of sexually transmitted infections will reduce the incidence of ectopic pregnancy. Ectopic pregnancy presents a major health problem for women of childbearing age. It is the result of a flaw in the human reproductive physiology that allows the conceptus to implant and mature outside the endometrial cavity, which ultimately ends in death of the foetus. Without timely diagnosis and treatment, ectopic pregnancy can become a life-threatening situation. In addition to the immediate morbidity caused by ectopic pregnancy, the woman's future ability to reproduce may be adversely affected as well.

Ectopic pregnancy should be considered a relevant public health indicator in developing countries. An overall picture of the capacity of a health system to deal with the diagnosis and treatment of emergencies especially in the field of obstetrics and gynaecology (Goyaux et al, 2003). Ectopic pregnancy remains a major cause of maternal mortality and morbidity as well as early foetal wastage in Nigeria and other developing countries (Okunlola et al, 2006, Makinde et al, 1990, Baffoe & Nkyekyer, 1991, Abdul, 1999, Elhelw, 2003). A classical ectopic pregnancy does not develop into livebirth. Ectopic pregnancy can be difficult to diagnose because symptoms often mimic those of a normal early pregnancy. The first warning signs of an ectopic pregnancy are often pain or vaginal bleeding. Ectopic pregnancies continue to be a significant cause of maternal morbidity, mortality, and reproductive failure in Nigeria (Faleyimu et al, 2008). Ipsilateral ectopic pregnancy occurs rarely and may be difficult to diagnose in low resource settings where there are no diagnostic tools especially vaginal ultrasound probe. When vaginal ultrasound probe is available, there are no trained medical personnel to operate such sophisticated equipments. There are few reported cases of ectopic pregnancy on a previous ectopic pregnancy stump. Ectopic pregnancy may pose a diagnostic dilemma where facilities are not available. In developed nations, treatment options have shifted from laparotomy to conservative surgical and non-surgical techniques. The availability of high-resolution ultrasonography with vaginal transducers in combination with the discriminatory zone of the beta subunit of human chorionic gonadotrophin has increased early diagnosis of the ectopic pregnancy in centres, which have such facilities (Ory, 1992). As the ability to diagnose ectopic pregnancy improves, physicians will be able to intervene sooner, preventing life threatening sequelae and extensive tubal damage, which could preserve future fertility. Already with improving technology, physicians are treating ectopic pregnancies with minimally invasive surgery or no surgery at all. Physicians have been able to reduce the mortality rate secondary to ectopic pregnancy despite its growing incidence.

Efforts to improve early diagnosis prior to tubal rupture however remain a great challenge in the developing countries and under equipped hospitals. The future fertility outcome is improved if the contra-lateral tube is normal. However, it is subjective to assess the normalcy of the tube by gross assessment since the pathology that usually predisposes to the ectopic pregnancy is intraluminal and may be present in the contra-lateral tube. Nevertheless, the practice of examination and documentation of the status of the contra-lateral tube during laparotomy for ectopic pregnancy is important. Late diagnosis leading to almost all cases of major complications and emergency surgical treatments are key elements accounting for such high fatality rates in women suffering

from ectopic pregnancy in Africa. Transportation to an appropriate health facility can be a cause of late presentation. Ectopic pregnancy should be considered a relevant public health indicator in developing countries providing an overall picture of the capacity of a health system to deal with the diagnosis.

13. Acknowledgement

Dr Emmanuel Etriem and Dr Aliyu Abdullahi both medical officers at General hospital Aliero Kebbi State, Nigeria at the time of the study are both acknowledged.

14. References

- Abasiattai AM, Utuk MN, Ugege W. (2010). Spontaneous Heterotropic Pregnancy with Tubal Rupture and Delivery of a Live Baby at Term: A Case Report. *Nigerian Journal of Medicine*. Vol 19. No 2. (April-June 2010). Pp 236-238. ISSN 1115 – 2613
- Abdul IF. (1999). Ectopic Pregnancy in Ilorin, Nigeria. *International Journal of gynecology and obstetrics* Vol 66. Pp 179-80. ISSN 0020-7292
- Abedi HO, Okonta PI, Igberase GO. (2010). Heterotropic Gestation: Successful Vaginal Term Delivery after Laparotomy in the First Trimester. *Nigerian Journal of General Practice*. Vol 8. No 5. Pp 8-10. ISSN 1118-4647
- Aboyeji AP, Fawole AA, Ijaiya MA. (2002). Trends in Ectopic Pregnancy in Ilorin, Nigeria. *Nigerian Journal of Surgical Research*. Vol 4. No 1-2. (March-June 2002). Pp 6-10. ISSN: 1595-1103
- Abudu OO, Egwatu JI, Imosemi OO, Ola ER. (1999). Ectopic Pregnancy: Lagos University Teaching Hospital Experience over a Five-Year Period. *Nigerian Quarterly Journal of Hospital Medicine*. Vol 9. Pp: 100-3. ISSN 0189-2657
- Abudu OO, Olatunji AD. (1996). A Review of Maternal Mortality in Lagos University Teaching Hospital. *Nigerian Medical Practitioner*. Vol 31. Pp: 12-6. ISSN 0189-0964
- Adesiyun GA, Adze J, Onwuhafua A, Onwuhafua PI. (2001). Ectopic pregnancies at Ahmadu Bello University Teaching Hospital, Kaduna, Northern Nigeria. *Tropical Journal of Obstetrics and Gynaecology*. Vol 18. No 2. Pp: 82-86. ISSN 0189-5178
- Airede LR, Ekele BA. (2005). Ectopic Pregnancy in Sokoto, Northern Nigeria. *Malawi Medical Journal*. Vol 17. No 1. Pp: 14-16. ISSN 1995-7262, online 1995-7270
- Aliyu JA, Eigbefoh JO, Mabayoje PS. (2008). Heterotropic Pregnancy: A Report of Two Cases. *Nigerian Journal of Clinical Practice*. (March 2008). Vol 11. No 1. Pp: 85-87. ISSN 1119-3077
- Amoko DH, Buga GA. (1995). Clinical Presentation of Ectopic Pregnancy in Transkei, South Africa. *East African Medical Journal*. Vol 72. No 12. (December 1995). Pp: 770-3. ISSN 0012-835X
- Anorlu RI, Oluwole A, Abudu OO, Adebajo S. (2005). Risk Factors for Ectopic Pregnancy in Lagos, Nigeria. *Acta Obstetrica et Gynecologica Scandinavica*. Vol 84. No 2. (February 2005). Pp: 184-8. ISSN 1600-0412

- Arora D, Bhattacharyya TK, Kathpalia SK, Kochar SPS. (2005). Acute abdomen in Gynaecologic Practice. *Medical Journal Armed Forces India*. Vol 61. Pp 66-70. ISSN 0377-1237
- Arup KM, Nilotpal R, Kakali SK, Pradip KB. (2007). Ectopic Pregnancy: An Analysis of 180 Cases. *Journal of the Indian Medical Association*. Vol 105. Pp 308-314. ISSN 0019-5847
- Atrash HK, Strauss LT, Kendrick JS, Skjeldestad FE, Ahn YW. (1997). The Relationship between Induced Abortion and Ectopic Pregnancy. *Obstetrics and Gynaecology*. Vol 89. Pp 512-8. ISSN 0029-7844
- Ayoubi J, Fanchin R. (2003). Ectopic Pregnancy: Which Side to Operate? *The Lancet*. Vol 362. No 9391. (October 11, 2003). Pp 1183. ISSN 0140-6736 retrieved from <www.thelancet.com>
- Aziz S, Al-Wafi B, Swadi HA. (2011). Frequency of Ectopic Pregnancy in A Medical Centre, Kingdom of Saudi Arabia. *Journal of Pakistan Medical Association*. Vol 61. No 3. (March 2011). Pp 221-224. ISSN 0030-9982
- Baffoe S, Nkyekyer K. (1999). Ectopic Pregnancy in Korle Bu Teaching Hospital, Ghana: A Three-Year Review. *Tropical Doctor*. Vol 29. No 1. (January 1999). Pp: 18-22. ISSN 0049-4755
- Barnhart KT. (2009). Ectopic Pregnancy. *New England Journal of Medicine*. Vol 361. No 4. (July 23, 2009). Pp 379-387. ISSN 0028-4793 retrieved from <www.nejm.com>
- Baumann R, Magos AL, Turnbull AC. (1989). Managing Gynaecological Emergencies with Laparoscopy. *Maternal Mortality Journal*. Vol 299. Pp 371-4
- Berg CI, Shulman H, Green GA, Atrash HK et al. (1999). Estimates of the Annual Number of Clinically Recognised Pregnancies in the United States 1981-91. *American Journal of Epidemiology*. Vol 149. Pp: 1025-9. ISSN 0002-9262
- Bergsjø P, Storeide O, Veholmen M, Eide M, Sandvei R. (1997). The Incidence of Ectopic Pregnancy in Holland Country, Norway 1976-1993. *Acta Obstetrica ET Gynecologica Scandinavica*. 1997. Vol 76. Pp: 345-9. ISSN 1600-0412
- Bode-Law F, Igberase GO, Momoh MO. (2008). Ipsilateral Ectopic Pregnancy Occurring In the Stump of a Previous Ectopic Site: A Case Report. *Cases Journal*. No 1. Vol 343. November 21, ISSN 1757-1626 retrieved from www.casesjournal.com
- Bruhat MA, Menhes H, Mage G, Pouly Pl. (1980). Treatment of Ectopic Pregnancy By Means Of Laparoscope. *Fertility and Sterility*. Vol 33. Pp 411-14. ISSN 0015-0282
- Buster JE, Barnhart K. (2004). Ectopic Pregnancy: A Five-Step Plan for Medical Management. *OBG Management*. November 2004, Pp 74-85 retrieved from <www.obgmanagement.com>
- CDC (1992) (Centers for Disease Control and Prevention) Ectopic Pregnancy in the United States of America 1978-1989. CDC Surveillance Summaries. *Morbidity and Mortality Weekly Report*. Vol 41. Pp 591-594. ISSN 0149-2195
- Complications of Pregnancy Part 1. (2007). Early Pregnancy. Vol 9 No 6 retrieved from <www.ebmedicine.net>
- Condous G. (2006). Ectopic Pregnancy: Risk Factors and Diagnosis. *Australian Family Physician*. Vol 35. No 11. November 2006. Pp 854-857. ISSN 0300-8495

- Coste J, Job-Spira N, Aublet- Cuvellier B Et Al. (2003). Incidence of Ectopic Pregnancy: First Results of a Population Based Register in France. *American Journal of Epidemiology*. (February 2003). Vol 157. No 3. Pp 185-94. ISSN 0002-9262 retrieved from <<http://aje.oxfordjournals.org>>
- Coutin A, Grouzard V, Henkens M, Marquard TT. (2007). *Obstetrics in Remote Settings Practical Guide For Non-Specialised Health Care Professionals*. Médecins sans Frontiers, Paris. Pp 29-32. ISBN 2-906498-67X retrieved from <www.msf.org>
- DeVoe RW, Pratt JH. (1948). Simultaneous Intrauterine and Extrauterine Pregnancy. *American Journal of Obstetrics and Gynaecology*. Vol 56. Pp 1119-21. ISSN 0002-9378
- Diagnostic Imaging Pathways retrieved from <www.imagingpathways.health.wa.gov.au>
- Dickens BM, Feweders A, Cook RJ. (2003). Ectopic Pregnancy and Emergency Care: Ethical and Legal Issues. *International Journal of Gynecology and Obstetrics*. Vol 82. No 1. Pp 121-6. ISSN 0020-7292
- Doyle MB, Decherney AH, Diamond MP. (1991). Epidemiology and Aetiology of Ectopic Pregnancy. *Obstetrics and Gynaecology Clinics of North America*. Vol 18. No 4. (March 1991) Pp 1-17. ISSN 0889-8545
- Egwuatu VE, Ozumba BC. (1987). Unexpected Low Ratio And Falling Incidence Rate Of Ectopic Pregnancy In Enugu, Nigeria 1978-1981. *International journal of Fertility*. Vol 32. Pp 113-121. ISSN 0020-725X
- Elhelw B. (2003). Ectopic Pregnancy. *Middle East Fertility Society Journal*. Vol 8. No 2. Pp 103-116. ISSN 1110-5690
- Ekanem El, Ekott M, Udoma E, Udofia O, Udo A, Iklaki C. (2009). Incidence Of Ectopic Pregnancy In Calabar, Nigeria: Two Halves Of The Last Decade Compared. *Global Journal of Community Medicine*. Vol 2. No 1 & 2. ISSN: 1597-9857. retrieved from <www.ajol.info>
- Ekele BA. (2001). Medical Treatment Of Ectopic Pregnancy Using Parenteral Methotrexate. *West African Journal of Medicine*. Vol 20. Pp 181-183. ISSN 0189-160X
- Erondu FO, Okoro CR, Aniemeka JI, Ugwu AC, Ohuegbe CI. (2010). Atypical Clinical Sonographic Presentation of Ectopic Pregnancy: A Case Report. *Journal of Medicine and Medical Sciences*. Vol 1. No 4. (May 2010). Pp 087-090. ISSN 1119-3999 retrieved from <www.intersjournals.org/JMMS>
- Essel EK, Ezem BU, Otubu JA. (1980) Ruptured Tubal Pregnancy In The Northern Part Of Nigeria. *East African Medical Journal*. 1980. Vol 57. Pp: 574-584. ISSN 0012-835X
- Eze JN. (2008). Successful Intrauterine Pregnancy Following Salpingostomy: Case Report. *Nigerian Journal of Medicine*. Vol 17. No 3. (July-August 2008). Pp 360-362. ISSN 1115-2613
- Faleyimu BL, Igarase GO, Momoh MO. (2008). Ipsilateral Ectopic Pregnancy Occurring In the Stump of a Previous Ectopic Site: A Case Report. *Cases Journal*. Vol 1 No 1. (November 2008). Pp 343. ISSN 1757-1626 retrieved from <www.ncbi.nlm.nih.gov>
- Farquhar CM. (2005). Ectopic Pregnancy. *The Lancet*. Vol 366. Pp 583-591. ISSN 0140-6736 retrieved from <www.thelancet.com>

- Fernandez H, Coste J, Job-Spira N. (1991). Controlled Ovarian Hyperstimulation As A Risk Factor For Ectopic Pregnancy. *Obstetrics and Gynaecology*. Vol 78. Pp 656. ISSN 0029-7844
- Fisch JD, Ortiz BH, Tazuke SI, Chitkara U, Giudice LC. (1998). Medical Management of Interstitial Ectopic Pregnancy: A Case Report and Literature Review. *Human Reproduction*. Vol 13. No 7. July 1998. Pp 1981-1986. ISSN 1355-4786
- Fowler PBS. (2006). Ectopic Pregnancy. *The Lancet*. Vol 367. Pp 27. ISBN 0140-6736 retrieved from <www.thelancet.com>
- Fylstra DL. (2002). Ectopic Pregnancy within a Caesarean Section Scar: A Review. *Obstetric and Gynaecologic Survey*. Vol 57. Pp 537-43. ISSN 0029-7828
- Fylstra DL, Pond-Chang T, Miller MG, Cooper A, Miller KM. (2002). Ectopic Pregnancy within a Caesarean Section Delivery Scar: A Case Report. *American Journal of Obstetrics and Gynaecology*. Vol 187. Pp 302-4. ISSN 0002-9378
- Gazvani MR. (1996). Modern Management of Ectopic Pregnancy. *British Journal of Hospital Medicine*. Vol 56. Pp 597-599. ISSN 0007-1064
- Gharoro EP, Igbafe AA. (2002). Ectopic Pregnancy Revisited In Benin City, Nigeria: Analysis of 152 Cases. *Acta Obstetrica et Gynecologica Scandinavica*. Vol 81. No 12. (December 2002). Pp: 1139-1143. ISSN 1600-0412
- Goyaux N, Leke R, Keita N, Thonneau P. (2003). Ectopic Pregnancy in African Developing Countries. *Acta Obstetrica et Gynecologica Scandinavica*. Vol 82. No 4. April 2003. Pp: 305-12. ISSN 1600-0412
- Gracia CR, Barnhan KT. (2001). Diagnosing Ectopic Pregnancy: Decision Analysis Comparing Six Strategies. *Obstetrics and Gynaecology*. Vol 97. Pp 469-70. ISSN 0029-7844
- Grimes DA. (1994). The Morbidity and Mortality of Pregnancy: Still Risky Business. *American Journal of Obstetrics and Gynaecology*. Vol 170. Pp 1489-1494. ISSN 0002-9378
- Hanretty KP. (2003). *Obstetrics Illustrated*. Churchill Livingstone. Sixth Edition. ISBN 044-307268-X. London. Pp 161-69.
- Herman A, Weinraub Z, Avrech O, Maymon R, Ron-El R, Bukovsky Y. (1995). Follow Up and Outcome of Isthmic Pregnancy Located In A Previous Caesarean Section Scar. *British Journal of Obstetrics and Gynaecology*. Vol 102. Pp 839-41. ISSN 0368-2315
- Ibekwe PC. (2004). Ruptured Advanced Tubal Pregnancy Simulating Uterine Rupture: A Case Report. *Nigerian Journal of Medicine*. Vol 13. No 2. (April-June 2004). Pp 196-198. ISSN 1115-2613
- Igbarase GO, Ebeigbe PN, Igbekoyi OF, Ajufoh BI. (2005). Ectopic Pregnancy, an 11 Year Review in A Tertiary Centre in the Niger Delta. *Tropical Doctor*. Vol 35. No 3. Pp 175-177. ISSN 0049-4755
- Ikpeze OC. (1991). A Critical Assessment of the Usefulness of Abdominal Ultrasound in the Diagnosis of Ectopic Pregnancy. *Nigerian Journal of Surgical Sciences*. Vol 1. Pp 25-27. ISSN 1116-5898
- Ilesanmi OA, Shobowale OA. (1992). Ectopic Pregnancy in Ibadan, Nigeria. *Nigerian Medical Journal*. Vol 23. No 1. Pp 11-14. ISSN 0300-1652

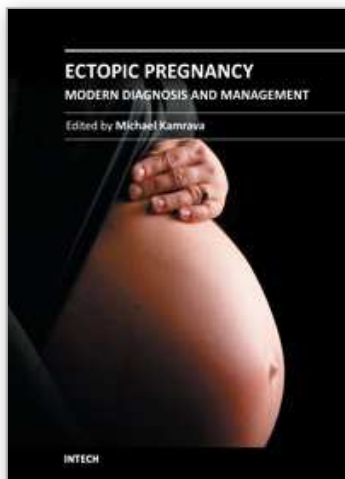
- Jogo AA, Swende TZ. (2008). Ruptured Tubal Pregnancy in Makurdi, North Central Nigeria. *Nigerian Journal of Medicine*. Vol 17. No 1. (January-March 2008). Pp: 75-77. ISSN 1115-2613
- Jurkovic D. (2007) Ectopic Pregnancy. In Edmonds DE (Ed) *Dewhurst's Textbook of Obstetrics and Gynaecology for Postgraduates*. (Seventh Edition), Blackwell Science Limited, Pp 106-116. ISBN 978-1-405-3355-5. London
- Kaplan BC, Dart RG, Moskos M, Kharwadkar E, Chun B, Hamid MA (1996) Ectopic Pregnancy: Prospective Study With Improved Diagnostic Accuracy. *Annals of Emergency Medicine*. Vol 28. Pp 10-17. ISSN 1097-6760 Retrieved from <www.annemermed.com>
- Kendrick JS, Tiemey EF, Lawson HW, Strauss LT, Klein L, Atrash HK. (1996). Previous Caesarean Delivery and the Risk of Ectopic Pregnancy. *Obstetrics and Gynaecology*. Vol 87. No 2. February 1996. Pp 297-301. ISSN 0029-7844
- Kigbu JH, Pam IC, Ekwempu CC, Swen PD. (2006). Splenic Rupture Masquerading Ruptured Ectopic Pregnancy. *Highland Medical Research Journal*. Vol 4. No 1. Pp 119-122. (2006). ISSN 1596-2407
- Kjellberg L, Lalos O. Lalos A. (2000). Reproductive Outcome after Surgical Treatment of Ectopic Pregnancy. *Gynaecologic and Obstetric Investigation*. Vol 49. Pp 227-230. ISSN 1423-002X
- Kouam L, Kamdom-Moyo J, Ngassa P, Doh AS. (1996). Treatment of Ectopic Pregnancy by Laparotomy in Under-Equipped Countries: A Series of 144 Cases at the Yaoundé University Hospital Centre, Cameroun. *Journal de Gynécologie et Obstétrique Biologie de Reproduction (Paris)*. Vol 25. Pp 804-808. ISSN 0368-2315
- Leeman LM, Wendland CL. (2000). Cervical Ectopic Pregnancy, Diagnosis with Endovaginal Ultrasound Examination and Successful Treatment with Methotrexate. *Ach Family Medicine*. Vol 9. (January 2000). Pp 72-77 retrieved from <www.archfammed.com>
- Leke RJ, Goyaux N, Matsuda T, Thonneau PF. (2004) Ectopic Pregnancy In Africa: A Population Based Study. *Obstetrics and Gynaecology*. Vol 103. No 4. April 2004. Pp 692-7. ISSN 0029-7844
- Lucie M, Montreal QC, Michael C, Halifax NS. (2005). Ultrasound Evaluation of First Trimester Pregnancy Complications. *Journal of Obstetrics and Gynecology of Canada*. Vol 161. (June 2005). Pp 581-585. ISSN 1701-2163
- Ling FW, Stovall TG. (1994). Update On the Management of Ectopic Pregnancy. *Advanced Obstetrics and Gynaecology*. Vol 1. Pp 57. ISSN 0029-7844
- Lipscomb GH, Stovall TG, Ling FW. (2000). Nonsurgical Treatment of Ectopic Pregnancy. *New England Journal of Medicine*. Vol 343. No 18. November 2. Pp 1325-1329. ISSN 0028-4793 retrieved from <www.nejm.com>
- Loughney A, Stirgess S. (2004). Obstetric and Gynaecological Emergencies in Brooks A, Connolly J, Chan O (Eds). *Ultrasound in Emergency Care*. BMJ Books. Blackwell Publishing. Massachusetts. Pp 79. ISBN 0-7279-1731-5
- Makinde OO, Oggunniyi SO. (1990). Ectopic Pregnancy in a Defined Nigerian Population. *International Journal of Gynecology and Obstetrics*. Vol 33. Pp 239-41. ISSN 1471-0528

- Makinem J. (1993). Is The Epidemic Of Ectopic Pregnancy Over? In: Proceedings of the 10th Meeting of the International Society for Sexually Transmitted Disease Research. Helsinki, Finland. 29th August/ September 1993: Pp 71-79
- Moore J, Tay JL, Walker J. (2000). Ectopic Pregnancy. *British Medical Journal*. Vol 320. Pp: 916-9. ISSN 0959-8138
- Morcau JC, Rupari L, Dionne P et al. (1995). Epidemiological and Anatomico-Clinical Features Of ExtraUterine Pregnancy at the Dakar University Hospital Centre. *Dakar Medicine*. Vol 40. Pp 175-179. ISSN 0049-1101
- Musa J, Daru PH, Mutihir JT, Ujah IAO. (2009). Ectopic Pregnancy in Jos Northern Nigeria: Prevalence and Impact on Subsequent Fertility. *Nigerian Journal of Medicine*. Vol 18. No 1. (January-March 2009). Pp 35-38. ISSN 1115-2613
- Mutihir JT, Nyango DD. (2010). Massive Haemoperitoneum from Endometriosis Masquerading As Ruptured Ectopic Pregnancy: Case Report. *Nigerian Journal of Clinical Practice*. Vol 13. No 4. (October-December 2010). Pp 477-479. ISSN 1119-3077
- Nannie B, Claus OL, Bent O, Nilas L. (2003). Improved Fertility Following Conservative Surgical Treatment Of Ectopic Pregnancy. *British Journal of Obstetrics and Gynaecology*. Vol 110. August 2003. Pp 765-770. ISSN 0306-5456
- Nwagha UI, Iyioke C, Nwagha TU. (2007). Current Trends in the Management of Ectopic Pregnancy: A Review. *Journal of the College of Medicine*. Vol 12. No 2. Pp 67-75. ISSN 188-2601
- Odewale MA, Afolabi MO. (2008). Heterotopic Pregnancy: A Clinical Case Report from Rural Nigeria. *Rural and Remote Health*. Vol 8: 979 online (September 2008) ISSN 1445-6554 retrieved from <<http://rrh.org.au>>
- Okohue JE, Ikimalo JL, Omoregie OB. (2010). Ectopic Pregnancy Following In vitro Fertilization and Embryo Transfer. *West African Journal of Medicine*. Vol 29. No 5. (September-October 2010). Pp 349-351. ISSN 0189-160X
- Okunlola MA, Adesina OA, Adekunle AO. (2006). Repeat Ipsilateral Ectopic Gestation: A Series of Three Cases. *African Journal of Medicine and Medical Science*. Vol 35. Pp 173-5. ISSN 1116-4077
- Olarewaju RS. (1994). Trends of Ectopic Pregnancy at Jos University Teaching Hospital. *Nigerian Medical Journal*. Vol 26. No 2. Pp: 57-59. ISSN 0300-1652
- Oloyede OAO, Lamina MA, Odusoya OL et Al. (2002). Ectopic Pregnancy in Sagamu: A 12-Year Review. *Tropical Journal of Obstetrics and Gynaecology*. Vol 19. Supplementary 2. Pp: 34-35 ISSN 0189-5178
- Oronsanye AU, Odiase GI. (1981). The Prevalence of Ectopic Pregnancy in Benin City, Nigeria. *Tropical Doctor*. Vol 11. No 4 (October 1981). Pp 160-3. ISSN 0049-4755
- Ory SJ. (1992). New Options for Diagnosis and Treatment of Ectopic Pregnancy. *Journal of American Medical Association*. Vol 267. Pp: 534-537. ISSN 0098-7484 Retrieved from <www.jama.com>
- Otubu JAM, Piam IC. Ectopic Pregnancy In: *Textbook of Obstetrics and Gynaecology for Medical Students*, Agboola A (ED). Pp 101-105. Second Edition. Heinemann Educational Books (Nigeria) Plc. 2006. ISBN 978-193-024-1. Ibadan

- Perrin R, Boco V, Bilongo B, Akpovi B, Alihonou E. (1997). Management of Ectopic Pregnancies at the University Clinic of Obstetrics and Gynaecology in Cotonou, Benin. *Santé*. 1997. Vol 7. Pp: 201-3. ISSN 1192-4829
- Picaud A, Nlome-Nze AR, Ogowet-Igumu N. (1990). Diagnostic Echography of Extrauterine Pregnancy (EUP) Apropos Of 228 Extrauterine Pregnancies Confirmed By Laparatomy. *Journal De Gynécologie, Obstétrique et Biologie de la Reproduction*. Vol 19. Pp 817-21. ISSN 0368-2315
- Pitkin J, Peattie AB, Magowan BA. (2003). *Obstetrics and Gynaecology: An Illustrated Colour Text*. Churchill Livingstone. London. Pp 98-99. ISBN 044305035X
- Qureshi NS, Wiener JO, Weerakkody ANA. (2006). Laparoscopic Management of Tubal Pregnancy: Availability of Training. *The Obstetrician and Gynaecologist*. Vol 8. Pp 251-255 retrieved from <www.rcog.org.uk>
- Rajkhowa M, Rutherford AJ, Sharma V, Glass MR, Balen AH, Cuckle HS. (2000). Trends in the Incidence of Ectopic Pregnancy in England and Wales from 1966 to 1996. *British Journal of Obstetrics and Gynaecology*. Vol 107. Pp 369-374. ISSN 0306-5456
- Ratinahirana S, Razanamparany PV, Radaniarison H, Ratsimanohatra E, Rakotozafy G.(1997). Current Aspects of Extrauterine Pregnancy in Nosy Be (Madagascar) From November 1993 to February 1995. *Santé*.. Vol 7. Pp: 19-23. ISSN 1192-4829
- Royal College of Obstetricians and Gynaecologists. (2004) The Management of Tubal Pregnancy. Guideline. No 21. London. RCOG Press. May 2004. Retrieved from <www.rcog.org.uk>
- Safdarian L, Mossayebi E, Badehnoosh B. (2008). Medical Management of Ectopic Pregnancy with High HCG Levels: A Case Series. *Middle East Fertility Society Journal*. Vol 13. No 1. (2008). Pp 57-58. ISSN 1110-5690
- Sherman D, Langer R, Sadovsky G, Bukovsky I, Caspi E. (1982). Improved Fertility Following Ectopic Pregnancy. *Fertility and Sterility*. Vol 38. Pp 427-430. ISSN 0015-0282
- Simmons ED. (2008). Transfusion Therapy. In Bongard FS, Sue DY, Vintch JRS. (EDS). *Current Diagnosis and Treatment Critical Care*. Third Edition. New York. McGraw-Hill Medical. Pp 71-87. ISBN 0-07-143657-X
- Sowter MC, Farquhar CM (2004). Ectopic Pregnancy: An Update. *Current Opinion in Obstetrics and Gynaecology*. Vol 16. No 4. Pp 289-293. ISSN 1473-656X
- Tenore JL. (2000). Ectopic Pregnancy. *American Family Physician*. Vol 61. Pp 1080-8. ISSN 0002-838X
- Thonneau P, Hijazi Y, Goyaux N, Calvez T, Keita N. (2002). Ectopic Pregnancy in Conakry, Guinea. *Bulletin of the World Health Organization*. Vol 80. No 5. Pp 365-370 Retrieved from <www.who.int>
- Tulandi T. (1998). Reproductive Performance of Women after Two Tubal Ectopic Pregnancies. *Fertility and Sterilization*. Vol 50 Pp 164. ISSN 0015-0282
- Tulandi T, Saleh A. (1997). Surgical Management of Ectopic Pregnancy. *Clinical Obstetrics and Gynaecology*. Vol 42. (1997). Pp 31-35. ISSN 1532-5520

- Tuomivaara L, Kauppila A. (1988). Radical or Conservative Surgery for Ectopic Pregnancy. A Follow-Up Study of Fertility of 323 Patients. *Fertility and Sterility*. Vol 50. (1988). Pp 580. ISSN 0015-0282
- Udigwe GO, Umeonunihu OS, Mbachu II. (2010) Ectopic Pregnancy: A Five Year Review Of Cases At Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, Nigeria. *Nigerian Journal of Medicine*. Vol 51. No 4. (October-December 2010). Pp 160-165. ISSN 1115 - 2613
- Varma R, Gupta J. (2009). Tubal Ectopic Pregnancy. *Clinical Evidence*. Vol 04. Pp 1406. ISSN 1462-3846
- Wagner MJ, Promes SB. (2007). *Last Minute Emergency Medicine*. McGraw Companies Limited. New York. Pp 310-311. ISSN 0-07-150975-5

IntechOpen



Ectopic Pregnancy - Modern Diagnosis and Management

Edited by Dr. Michael Kamrava

ISBN 978-953-307-648-5

Hard cover, 248 pages

Publisher InTech

Published online 26, October, 2011

Published in print edition October, 2011

Ectopic pregnancy is the second major cause of maternal mortality in the United States and a leading cause of maternal morbidity and mortality in the world. This book contains the practical methods to early diagnosis of various forms of ectopic pregnancies and their modern management. Ectopic Pregnancy - Modern Diagnosis and Management is a comprehensive book which guides the reader through all features of ectopic pregnancy, both practical and academic, covering all aspects of diagnosis and management of ectopic pregnancy in a clear, concise, and practical fashion. The book is organized so that it can either be read cover to cover for a comprehensive tutorial or be kept desk side as a reference to the ectopic pregnancies. Each chapter introduces a number of related ectopic pregnancy and its diagnosis, treatment and co-morbidities supported by examples. Included chapters bring together valuable materials in the form of extended clinical knowledge from practice to clinic features.

How to reference

In order to correctly reference this scholarly work, feel free to copy and paste the following:

Buowari Yvonne Dabota (2011). Management and Outcome of Ectopic Pregnancy in Developing Countries, Ectopic Pregnancy - Modern Diagnosis and Management, Dr. Michael Kamrava (Ed.), ISBN: 978-953-307-648-5, InTech, Available from: <http://www.intechopen.com/books/ectopic-pregnancy-modern-diagnosis-and-management/management-and-outcome-of-ectopic-pregnancy-in-developing-countries>

INTech
open science | open minds

InTech Europe

University Campus STeP Ri
Slavka Krautzeka 83/A
51000 Rijeka, Croatia
Phone: +385 (51) 770 447
Fax: +385 (51) 686 166
www.intechopen.com

InTech China

Unit 405, Office Block, Hotel Equatorial Shanghai
No.65, Yan An Road (West), Shanghai, 200040, China
中国上海市延安西路65号上海国际贵都大饭店办公楼405单元
Phone: +86-21-62489820
Fax: +86-21-62489821

© 2011 The Author(s). Licensee IntechOpen. This is an open access article distributed under the terms of the [Creative Commons Attribution 3.0 License](https://creativecommons.org/licenses/by/3.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

IntechOpen

IntechOpen