

# The Value of the Early Pregnancy Assessment Clinic in the Management of Early Pregnancy Complications

Modupe Tunde-Byass, MBBS, FRCOG, FRCSC, Vincent Y.T. Cheung, MBBS, FRCOG, FRCSC

Department of Obstetrics and Gynaecology, North York General Hospital, Toronto ON

## Abstract

**Objective:** To determine the value of North York Hospital's Early Pregnancy Assessment Clinic (EPAC) in the management of early pregnancy complications and its effect on the number of emergency room (ER) visits.

**Methods:** The EPAC was opened in August 2005 at North York General Hospital. The number of patients being assessed, the sources of referral, the reasons for referral and the treatments provided in the clinic between January 2006 and December 2007 were reviewed. The number of patients attending the ER with the diagnoses of miscarriage, early pregnancy hemorrhage, and ectopic pregnancy one year prior to the opening of the EPAC (July 2004 to June 2005, year 0), during the first subsequent year (January to December 2006, year 1) and the second subsequent year (January to December 2007, year 2) were reviewed.

**Results:** Of the 1448 referrals to the EPAC during the two-year period, 38% were referred from the ER, 31% from family physicians, 24% from obstetricians, 2% from midwives, and 5% from other sources. The reasons for referral included confirmed missed miscarriage (450 patients, 31%), threatened miscarriage (471, 32.5%), complete miscarriage (182, 12.6%), ectopic pregnancy (111, 7.7%), incomplete miscarriage (59, 4.1%), hyperemesis gravidarum (23, 1.6%), and others (152, 10.5%). Through arrangements made by the clinic, 200 women underwent dilatation and curettage, and 133 were administered misoprostol to induce miscarriage. Fifty-seven patients with ectopic pregnancy received medical treatment with methotrexate, and 13 patients had surgery for ectopic pregnancy. There was no significant change in the total number of patients being assessed in the ER for early pregnancy hemorrhage, miscarriage, and ectopic pregnancy before and after the opening of the EPAC. However, there was a significant reduction in the number of repeat assessments in the ER for ectopic pregnancy, from 37% in year 0 (n = 24/65) to 24% in year 1 (n = 14/54) and 14.5% in year 2 (n = 9/62). There was also a trend towards a reduction in the number of repeat assessments in the ER for hemorrhage (year 0 = 32.4%; year 1 = 29.4%; year 2 = 27.5%), and miscarriage (year 0 = 19.5%; year 1 = 12.6%; year 2 = 16.9%).

**Conclusion:** The EPAC is of significant value in the management of early pregnancy complications. It is particularly useful in the follow-up of patients with ectopic pregnancy and also helps to reduce the number of patients attending the ER for follow-up of other early pregnancy complications.

## Résumé

**Objectif :** Déterminer la valeur de la *Early Pregnancy Assessment Clinic* (EPAC) du *North York Hospital* dans la prise en charge des complications aux débuts de la grossesse, ainsi que ses effets sur le nombre de visites au service des urgences (SU).

**Méthodes :** La EPAC a ouvert ses portes en août 2005 au *North York General Hospital*. Le nombre de patientes évaluées, les sources d'orientation, les raisons de l'orientation et les traitements offerts au sein de la clinique entre janvier 2006 et décembre 2007 ont été analysés. Le nombre de patientes se présentant au SU qui obtenaient un diagnostic de fausse couche, d'hémorragie aux débuts de la grossesse ou de grossesse ectopique un an avant l'ouverture de la EPAC (juillet 2004 - juillet 2005, an 0), au cours de la première année subséquente (janvier - décembre 2006, an 1) et au cours de la deuxième année subséquente (janvier - décembre 2007, an 2) a été analysé.

**Résultats :** Des 1 448 patientes orientées vers les services de la EPAC au cours de cette période de deux ans, 38 % ont été orientées par le SU; 31 %, par leur médecin de famille; 24 %, par leur obstétricien; 2 %, par leur sage-femme; et 5 %, par d'autres sources. Parmi les raisons menant à l'orientation, on trouvait la fausse couche inaperçue confirmée (450 patientes, 31 %), la menace de fausse couche (471, 32,5 %), la fausse couche complète (182, 12,6 %), la grossesse ectopique (111, 7,7 %), la fausse couche incomplète (59, 4,1 %), l'hyperemesis gravidarum (23, 1,6 %) et autres (152, 10,5 %). Par l'intermédiaire de dispositions prises par la clinique, 200 femmes ont subi une dilatation-curetage et 133 femmes se sont vu administrer du misoprostol afin de provoquer une fausse couche. Cinquante-sept patientes présentant une grossesse ectopique ont reçu un traitement médical au méthotrexate et 13 patientes ont subi une chirurgie motivée par la présence d'une grossesse ectopique. Aucune modification significative n'a été constatée, avant et après l'ouverture de la EPAC, en ce qui concerne le nombre total de patientes étant évaluées au SU en raison d'une hémorragie aux débuts de la grossesse, d'une fausse couche et d'une grossesse ectopique. Cependant, une baisse significative a été constatée en ce qui concerne le nombre de nouvelles évaluations au SU motivées par une grossesse ectopique; ce nombre est en effet passé de 37 % au cours de l'an 0 (n = 24/65) à 24 % au cours de l'an 1 (n = 14/54) et à 14,5 % au cours de l'an 2 (n = 9/62). On a également constaté une tendance à la baisse du nombre de nouvelles évaluations au SU motivées par une hémorragie

**Key Words:** Early pregnancy complications, miscarriage, hemorrhage, ectopic

Competing Interests: None declared.

Received on April 19, 2009

Accepted on June 9, 2009

(an 0 = 32,4 %; an 1 = 29,4 %; an 2 = 27,5 %) et par une fausse couche (an 0 = 19,5 %; an 1 = 12,6 %; an 2 = 16,9 %).

**Conclusion :** La EPAC compte une valeur significative dans la prise en charge des complications aux débuts de la grossesse. Elle s'avère particulièrement utile dans le suivi des patientes qui présentent une grossesse ectopique et contribue également à réduire le nombre de patientes se présentant au SU aux fins du suivi d'autres complications aux débuts de la grossesse.

J Obstet Gynaecol Can 2009;31(9):841-844

## INTRODUCTION

Early pregnancy loss is a common gynaecological problem affecting about 15% to 20% of all clinically recognised pregnancies.<sup>1,2</sup> Many women with early pregnancy loss present to the ER after hours when they do not have access to their own physicians. These women experience sadness and a sense of loss, but may also have to endure hours of waiting in the ER before they can be seen by a physician.<sup>3</sup> Facilities for immediate ultrasound examination and counselling may not always be readily available. If the woman requires surgery, the waiting time for the procedure is uncertain. These are some of the reasons why women feel that the services received in the ER are often suboptimal, even though they are life-saving.<sup>4</sup>

Unlike in the United Kingdom, where almost all hospitals have an early pregnancy assessment clinic, the EPAC model is not standard in Canada.<sup>5,6</sup> It has been shown that an EPAC can manage early pregnancy complications more efficiently than other units.<sup>3</sup>

In addition, women undergoing early pregnancy loss often report significant psychological sequelae.<sup>7</sup> The EPAC will not only ensure prompt diagnosis and provision of treatment options for women with early pregnancy complications, but also provide an opportunity for bereavement counselling.

The EPAC was established at North York General Hospital in August 2005 to offer women with early pregnancy complications prompt diagnosis, options for management, bereavement counselling, and follow-up. It is a "one-stop clinic" for women who have complications of pregnancy before 20 weeks' gestation. The clinic is open on three mornings per week from 0900 to 1200. The clinic's administrative staff book appointments for new referrals to be seen in the clinic within 24 hours. The clinic is run by a team of dedicated gynaecologists and experienced obstetrical nurses, with on-site ultrasound (both transabdominal and

**Table 1. Final diagnosis of patients referred**

Diagnosis	n (%)
Missed miscarriage	450 (31)
Threatened miscarriage	471 (32.5)
Complete miscarriage	182 (12.6)
Ectopic gestation	111 (7.7)
Incomplete miscarriage	59 (4.1)
Hyperemesis gravidarum	23 (1.6)
Others	152 (10.5)

transvaginal) services performed by the gynaecologists, easy access to laboratory services, and readily available operating room services. The clinic nurse is responsible for taking blood and sending samples directly to the laboratory. The clinic has electronic access to the laboratory for immediate access to results. Women identified as having normal pregnancies are reassured, while those having miscarriages or ectopic pregnancies are counselled and are offered appropriate interventions. Methotrexate and anti D immunoglobulin are administered in the clinic as required. Psychological support and follow-up visits are also provided when necessary. Nurses communicate by telephone with patients regarding their test results. Information pamphlets on early pregnancy loss, use of misoprostol for the management of miscarriage, and the Fetal Burial Program are available. A copy of the clinic note with details of the diagnosis, proposed treatment, and follow-up is sent to referring health care providers.

In this study, we reviewed the services that have been provided by the EPAC since its establishment in August 2005 to determine whether or not it can help to reduce the number of women attending the ER for early pregnancy complications.

## METHODS

The data from the EPAC database were reviewed. The number of patients being assessed, the sources of referral, the reasons for referral, and the treatments provided in the clinic between January 2006 and December 2007 were analyzed. The data for the number of patients who attended the ER for first consultation and repeat assessment were obtained from the medical record office according to the ICD 10 classification. The records of women who presented to the ER with diagnoses of abortion (code 002 and 003), early pregnancy hemorrhage (code 020), and ectopic pregnancy (code 000) during the year prior to the opening of the EPAC (July 2004 to June 2005, year 0), during the first subsequent year (January to December 2006, year 1),

## ABBREVIATIONS

β-hCG	beta human chorionic gonadotrophin
EPAC	early pregnancy assessment clinic
ER	emergency room

**Table 2. ER assessments for miscarriage, ectopic pregnancy, and hemorrhage**

	Year 0 n (%)	Year 1 n (%)	Year 2 n (%)
Total assessment, n	64 113	67 932	70 509
Miscarriage	487 (0.8)	438 (0.6)	462 (0.7)
Ectopic pregnancy	65 (0.1)	58 (0.1)	62 (0.1)
Hemorrhage	962 (1.5)	963 (1.4)	1079 (1.5)

**Table 3. Patients requiring ER reassessment for miscarriage, ectopic pregnancy, and hemorrhage**

	Year 0 n (%*)	Year 1 n (%*)	Year 2 n (%*)
Miscarriage	95 ( 19.5)	55 (12.6)	78 (16.9)
Ectopic pregnancy	24 (37.0)†	14 (24.0)	9 (14.5)†
Hemorrhage	312 (32.4)	285 (29.6)	297 (27.5)

\*Percentage of the total number of miscarriage, ectopic, and hemorrhage as specified in Table 2.

† $P < 0.005$

and during the second subsequent year (January to December 2007, year 2) were analyzed.

This study was approved by the Research Ethics Committee at North York General Hospital, a community teaching hospital affiliated with the University of Toronto.

## RESULTS

There were 1448 new referrals to the EPAC during the study period (January 2006 to December 2007). Of these, 557 referrals (38%) were from the ER, 445 (31%) from family physicians, 349 (24%) from obstetrician-gynaecologists, 30 (2%) from midwives, and 67 (5%) from other sources. The reasons for referral included missed miscarriage (450 patients, 31%), threatened miscarriage (471 patients, 32.5%), complete miscarriage (182 patients, 12.6%), ectopic pregnancy (111 patients, 7.7%), incomplete miscarriage (59 patients, 4.1%), hyperemesis gravidarum (23 patients, 1.6%) and others (152 patients, 10.5%). The final diagnoses of all patients who were referred to the clinic are shown in Table 1. Through the clinic, 200 patients had dilatation and curettage arranged, and 133 patients received medical treatment for early pregnancy loss. For management of ectopic pregnancy, 57 patients received methotrexate therapy and 13 patients had operative intervention. Five patients had surgery following failed methotrexate therapy. One patient had a ruptured ectopic pregnancy. Of the 111 patients who had ectopic pregnancy, 79 patients (71%) had the diagnosis made at the first visit, while in 32 patients (29%), the diagnosis was made at

follow-up visits. Of the patients who were treated with methotrexate, the average follow-up was 6.03 visits (range 2–14 visits).

The total number of ER assessments for year 0 (1 year prior to the opening EPAC), year 1 (January to December 2006), and year 2 (January to December 2007) were 64 113, 67 932 and 70 509, respectively. There was no significant change in the total number of patients assessed in the ER for early pregnancy hemorrhage, miscarriage, and ectopic pregnancy before and after the opening of EPAC (Table 2). However, there was a significant reduction in the number of repeat assessments in the ER for ectopic pregnancy (Table 3), from 37% in year 0 ( $n = 24/65$ ) to 24% in year 1 ( $n = 14/54$ ), and 14.5% in year 2 ( $n = 9/62$ ). There was also, a trend towards reduction in the number of repeat assessments in the ER for hemorrhage (year 0 = 32.4%; year 1 = 29.4%; year 2 = 27.5%; Table 3) and miscarriage (year 0 = 19.5%; year 1 = 12.6%; year 2 = 16.9; Table 3).

## DISCUSSION

About 15% to 20% of early pregnancies results in a miscarriage,<sup>1,2</sup> and early pregnancy loss can cause significant psychological morbidity.<sup>3,4</sup> The increased anxiety and psychosomatic symptoms resulting from a miscarriage can persist for many weeks after the event.<sup>3</sup> Most women who have early pregnancy complications receive care through the ER. In the early 1990s, early pregnancy assessment units were developed in the United Kingdom to provide care for women experiencing early pregnancy complications.<sup>5</sup> It was

advocated that all maternity units should provide an early pregnancy assessment clinic with easy access for general practitioners to refer their patients. The Royal College of Obstetricians and Gynaecologists in the United Kingdom also recommends the provision of psychological support to this group of women, with appropriate follow-up.<sup>6</sup>

The EPAC at North York General Hospital was established to provide an efficient and comprehensive clinic for women experiencing early pregnancy complications. The clinic has allowed easy access for all professionals providing care for pregnant women. We hoped that through this clinic, women with early pregnancy complications would be able to receive immediate, efficient, and compassionate care with a one-stop approach. Although we could not demonstrate a significant reduction in the overall number of ER assessments following the opening of the clinic, this could be because of the clinic's limited hours of operation. However, a 2.5-fold reduction in the rate of readmissions for ectopic pregnancy is encouraging.

Ectopic pregnancy is the leading cause of pregnancy-related death during the first trimester.<sup>7</sup> It accounts for 9% of all pregnancy-related deaths.<sup>8</sup> The diagnosis and management of ectopic pregnancy can be a challenge to health care providers because of the lack of clinical features distinguishing an ectopic pregnancy from a failed intrauterine pregnancy. In the past, the diagnosis of ectopic pregnancy was often not made until there were clinical features of rupture because of the lack of availability of serial ultrasound assessments and quantitative serum beta human chorionic gonadotrophin assays.

The outpatient management of ectopic pregnancy incorporating serial ultrasound examinations and serum  $\beta$ -hCG assays has reduced hospitalizations<sup>7</sup> and increased the proportion of ectopic pregnancies diagnosed before rupture.

Treatment with methotrexate is a widely accepted option in the management of ectopic pregnancy. In a Canadian study, 84% of patients with an ectopic pregnancy who received a single dose of methotrexate did not require further treatment, and 54% had subsequent intrauterine pregnancies.<sup>9</sup> However, the success of such an approach can be achieved only with close surveillance and multiple follow-up visits.

In our clinic, patients requiring surgical intervention are booked for surgery on the same day, with surgery being performed by the on-call gynaecologist. Patients requiring medical treatment are followed on days 4 and 7 after the administration of methotrexate and weekly thereafter until the serum  $\beta$ -hCG level is  $< 5$  IU/L; methotrexate is administered again if the serum  $\beta$ -hCG level rises inappropriately or plateaus.

Our experience indicates that an EPAC can provide an ideal environment for the management of confirmed or suspected ectopic pregnancies. Patients can have ready access to pelvic ultrasound examination and monitoring of serum  $\beta$ -hCG. The results of investigations are rapidly available, allowing the gynaecologist to provide counselling to the patient about management options. Several patients who conceived after assisted reproductive technology were referred to the EPAC for the exclusion of heterotopic pregnancy.

Although our study did not demonstrate that the EPAC resulted in a significant reduction of the workload in the ER, it did show that the EPAC helped to reduce the number of repeat assessments for patients with ectopic pregnancy. We did not have a link between the ER data and the EPAC data in order to determine whether patients seen in the ER are indeed being followed up in the EPAC. Because of limited funding, our clinic is open only three times per week, whereas units in the United Kingdom are usually open daily. We hope that in the future, with increased clinic opening hours, our EPAC will not only provide an efficient, comfortable, and dedicated environment for the management of early pregnancy complications but will also significantly reduce the workload of the hospital emergency services.

## ACKNOWLEDGEMENTS

The authors wish to acknowledge the invaluable work of the following colleagues at the EPAC: Anna Chopra (clinical administrative clerk), Donna Murdoch, RN, Bonnie Kerr (unit administrator), Dr Dennis Chu, Dr Man Fan Ho, Dr Elyse Lackie, Dr Sabrina Lee, and Dr Kirsten Smith.

## REFERENCES

1. Alberman E. Spontaneous abortion: epidemiology. In: Stabile S, Grudzinkas G, Chard T, eds. Spontaneous abortion: diagnosis and treatment. London: Springer-Verlag;1992:9–20.
2. Wilcox AJ, Weinberg CR, O'Connor JF, Baird DD, Schlatterer JP, Canfield RE, et al. Incidence of early loss of pregnancy. *N Engl J Med* 1988;319(4):189–94.
3. Thapar AK, Thapar A. Psychological sequelae of miscarriage: a controlled study using the general health questionnaire and hospital anxiety and depression scale. *Br J Gen Pract* 1992;(42):94–6.
4. Rosen A. Last on the list. Personal views. *BMJ* 1998; 316:1324.
5. Biggig MA, Read MD. Management of women referred to early pregnancy assessment units: care and cost effectiveness. *BMJ* 1991;302(6776):577–9.
6. Royal College of Obstetricians and Gynaecologists. The management of early pregnancy loss. Green-top Guideline No. 25, October 2006.
7. Goldner TE, Lawson HW, Xia Z, Atrash HK. Surveillance for ectopic pregnancy—United States, 1970–1989. In: CDC surveillance summaries (December). *MMWR*1993;42 (No. SS-6): 73–85.
8. National Center for Health Statistics. Advanced report of final mortality statistics, 1992. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC;1994. (Monthly vital statistics report;43(6 Suppl).
9. Yao M, Tulandi T. Current status of surgical and non surgical management of ectopic pregnancy. *Fertil Steril* 1997;67(3):421–33.