Ovarian Cancer in Pregnancy at Siriraj Hospital: A Thirteen-Year Review (1998-2010)

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ABSTRACT

Objective: To determine the prevalence of ovarian cancer, staging, presenting symptoms, gestational age of diagnoses, screening and diagnostic methods and pregnancy outcomes during pregnancy at Siriraj Hospital over a 13-year period (1998-2010).
Methods: Medical records of pregnant women diagnosed with ovarian cancer at Siriraj Hospital from 1998 to 2010 were reviewed.
Results: During the 13-year period, 1998-2010, eight cases of pregnant women with ovarian cancer were detected. Six cases of ovarian cancer stage I and 2 cases of ovarian cancer stage II were recorded. All of the patients presented with the symptom of abdominal mass. Two cases presented with abdominal pain. Ultrasonography was performed in all cases to confirm the diagnosis. Two patients with stage II ovarian cancer which was diagnosed in early pregnancy, subsequently had abortions. Five cases from 6 cases of those patients with stage I ovarian cancer underwent caesarean delivery while one case had a normal vaginal delivery.
Conclusion: Regarding to this 13-year review, the prevalence of ovarian cancer in pregnancy was low. The management of pregnant patients with ovarian cancer depended on the gestational age and the staging of malignancy.

Keywords: Ovarian cancer, pregnancy

Siriraj Med J 2011;63:38-41
E-journal: http://www.sirirajmedj.com

Ovarian cancer which presents during the reproductive period is very low, around 0.01%.[1] Most cases are detected during the menopausal period. Only 0.2-2% of adnexal masses were detected during pregnancy and 1-6% of those masses were diagnosed as malignancies.[2] Due to the use of ultrasound screening during pregnancy and the high prevalence of caesarean section in this last decade, the diagnosis of adnexal mass has also increased. About 0.2- 2% of pregnancies are complicated by an adnexal mass, and approximately 1-6% of these masses are malignant.[3] This study presents the prevalence, screening and diagnostic methods and pregnancy outcomes of ovarian cancer in pregnancy during the 13 year-reviewed.

MATERIALS AND METHODS

The study was approved by the Ethics Committee at the Faculty of Medicine Siriraj Hospital, Mahidol University, approval number SI 009/2011. The medical records of ovarian cancer in pregnancy, presenting symptom, screening and diagnostic methods, staging, gestational age of diagnoses and pregnancy outcomes at Siriraj Hospital for the 13-year period (1998-2010) were reviewed and analyzed. SPSS version 13 was used to analyze the data.

Pre-operative diagnosis with ultrasound was performed in all cases. Doppler studies were performed in some patients. All cases of pregnancy with ovarian cancer were recruited. The diagnosis was performed during pregnancy. All data was collected from the statistical and oncology units. One case was missing during pregnancy and excluded from the data.

RESULTS

During the 13-year period, 1998-2010, 8 cases of pregnant women with ovarian cancer were detected at Siriraj Hospital. All details of the pregnant patients are presented in Table 1. There were 6 cases of ovarian cancer stage I and 2 cases of ovarian cancer stage II. The mean maternal age was 31.8 (23-41) years old. The mean gestational age at diagnosis was 14.3 (9-22) weeks of gestation. The mean gestational age at diagnoses of pregnant patients with ovarian cancer stage I and II were 14.6 (9-22) and 13 (12-14) weeks of gestation, respectively. All of the patients presented with the symptom of abdominal masses. Two cases presented with abdominal

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pain. Ultrasound was performed in all cases to confirm the diagnosis. Only one case (Patient No. 6) was diagnosed as germ cell malignancy. (Table 1)

All patients with stage I of ovarian cancer (6 cases) subsequently had successful delivery. (Fig 2) One case had normal vaginal delivery and the other 5 cases had elective caesarean section performed. The mean gestational age at delivery was 37.5 (36-39) weeks of gestation. (Fig 1) All patients had the size of ovarian malignancy greater than 10 cm. Salpingo-oophorectomies were performed in pregnant patients with stage I ovarian cancer during caesarean section. Abdominal and pelvic nodes assessment was performed during the operation. The histopathologies were mucinous/serous cystadenocarcinoma, clear cell carcinoma and yolk sac tumour. Adjuvant chemotherapy was combined in 2 cases of patients with stage I ovarian cancer (pregnant patients number 1 and 3) while the other 4 cases had no adjuvant chemotherapy. Post-operative adjuvant chemotherapy (ACT) was continued with carboplatin/paditaxel and cisplatinum/etoposide/bleomycin. No chemotherapy was given during pregnancy. All pregnant patients had epithelial ovarian cancer, except pregnant patient number 6 who had germ cell ovarian malignancy. Five cases had caesarean section performed while only one patient (No. 3) had a normal vaginal delivery. The mean neonatal body weight was 2,675 grams (1,560-3,110 grams). All neonates were normal with APGAR score 9, 10. The neonate from patient number 1 had fetal growth restriction.

The pregnant patients with stage II ovarian cancer underwent complete surgical staging. The histopathologies were mucinous and serous cystadenocarcinoma. Therapeutic abortion was performed in those patients after complete surgical staging. Adjuvant chemotherapy with cisplatinum/ cyclophosphamide or carboplatin/ cyclophosphamide was combined. The mean gestational age of therapeutic abortion was 17 (16-18) weeks of gestation.

Patient number 4 was dead after a complete course of ACT. Patient number 3 had a recurrent ovarian malignancy. The rest were normal with a 5-year survival of 100%.

DISCUSSION

Ovarian cancer is very rare malignancy in pregnant patients. Without ultrasound screening, ovarian cancer are usually detected during caesarean section or at an advanced stage during the post-partum period. At present, many asymptomatic adnexal masses are normally detected during first trimester ultrasound screening for fetal dating and abnormality.

TABLE 1. Details of pregnant patients with ovarian cancer during year 1998-2010.

Year	Pregnant patient (number)	Maternal age (years)	*GPA	Type and staging	Gestational age of suspected diagnosis	Presenting symptom	Screening and diagnostic method	Gestational age of delivery	Gestational age of abortion	Management	Neonatal body weight (grams)
2007	1	23	1,0,0	Epithelial I	14	Abdominal mass	**U/S	36	-	***SO+ ****CMT *****C/S	1,560
2006	2	37	1,0,0	Epithelial I	9	Abdominal mass and abdominal pain	**U/S	38	-	***SO *****C/S	3,110
2005	3	32	2,1,0	Epithelial I	10	Abdominal mass	**U/S	38	-	***SO+ ****CMT Normal labour	2,960
2004	4	27	1,0,0	Epithelial II	14	Abdominal mass and abdominal pain	**U/S	-	18	******t-abortion	-
2004	5	41	4,2,1	Epithelial II	12	Abdominal mass and abdominal pain	**U/S	-	16	******t-abortion	-
	6	31	1,0,0	Germ cell I	18	Abdominal mass	**U/S	36	-	***SO *****C/S	2,820
2002	7	30	1,0,0	Epithelial I	15	Abdominal mass	**U/S	38	-	***SO *****C/S	2,750
2001	8	33	1,0,0	Epithelial I	22	Abdominal mass	**U/S	39	-	***SO *****C/S	2,850

*GPA = gravida, parity, abortion
****CMT = chemotherapy
**U/S = ultrasonography
*****C/S = caesarean section
***S/O = salpingo-oophorectomy
****** t-abortion = therapeutic abortion

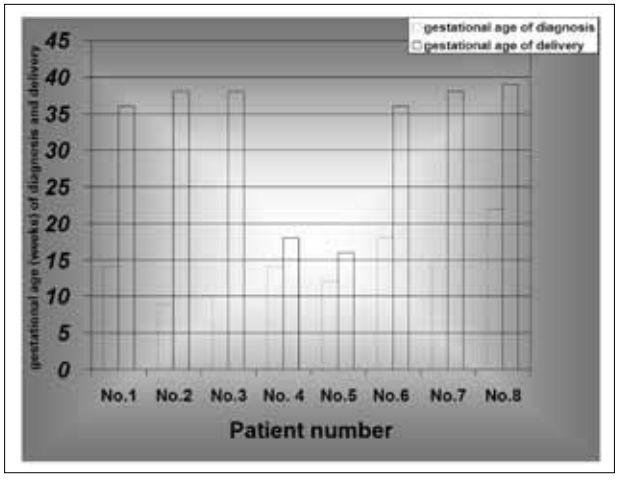

Fig 1. Gestational age of diagnosis and delivery of pregnant patients with ovarian cancer stage I and II (No. 4 and 5) (No. 6 with Germ cell malignancy)

Pregnant patients with ovarian cancer always present with non-specific symptoms including abdominal or back pain, constipation, abdominal swelling and urinary symptoms which are normally detected in normal pregnancy.[4] Some pregnant patients present with a lower abdominal mass or acute abdominal pain which is complicated by torsion of masses.[5] From this study all pregnant patients with ovarian cancer presented with an abdominal mass while only 2 cases presented with abdominal pain. Physical and per-vaginal examinations followed by ultrasound are routinely performed according to the presenting symptoms. When the ultrasound is unclear, the diagnosis by magnetic resonance imaging (MRI) should be performed.[6] Computed tomography (CT) should be avoided due to the risk of childhood malignancies and transient suppression of fetal thyroid from iodinated contrast agents.[7] However, ultrasound only was performed to diagnose ovarian cancer in this study.

Adnexal masses which are found in pregnancy are mostly benign. Functional cysts, less than 5 cm, are always detected and disappear during the second trimester.[8] Most persistent adnexal mass 5 cm or greater are mature teratoma.[9]

Tumour markers of ovarian cancer including AFP, CA 125, hCG and CEA, cannot be used during pregnancy because oncofetal antigens are involved in biological function related to fetal development, differentiation and maturation. The levels are always elevated during pregnancy or in abnormal placentation and fetal abnormalities.[10]

Epithelial ovarian cancers are the most common ovarian malignancy[11] while germ cell tumour is the second most common one.[12] Definite diagnosis must be followed by surgical intervention for pathological tissue diagnosis. From this study, 7 cases were epithelial ovarian cancer while only one case was germ cell malignancy. Therefore this series supported the evidence of the higher rate of epithelial ovarian cancer.

Surgical intervention should be performed in the indicated cases including persisting mass in the second trimester, mass larger than 10 cm in diameter and ultrasonographic findings suspected of malignancies (solid and mixed solid and cystic characteristics).[13] Surgical intervention in those indicated cases is to diagnose malignancy and prevent the complications of adnexal mass including torsion, rupture or obstructed labour. Moreover, torsion or rupture of the mass may result in preterm delivery.[14]

Surgical intervention with a midline incision can decrease the manipulation of the gravid uterus which can cause preterm labour, placental abruption and fetal loss. The most common tumours during pregnancy are benign dermoid cysts and mucinous and serous cystadenomas. Therefore cystectomy can be performed. If solid mass or other features of malignancy including ascites are detected, ipsilateral salpingo-oophorectomy should proceed. A frozen section should be organized in the same setting. If the frozen section confirms malignancy, full surgical staging and caesarean delivery should be performed. Surgical staging for stage I ovarian cancer is very importance. The adjuvant chemotherapy must be considered following the histological type of tumours.

In obvious advanced staging, adequate surgical staging is less important because chemotherapy is needed after surgery to control metastasis.[15] Caesarean hysterectomy is not necessary for maximal cytoreductive surgery at the initial surgery. A second operation for cytoreductive surgery can be performed after chemotherapy and successful completion of pregnancy. However, the prognosis of advanced stage ovarian cancer is poor, even though chemotherapy and complete delivery are performed.

From this study, salpingo-oophorectomy was performed in all cases of ovarian cancer stage I. Only 2 cases were combined with chemotherapy, and 4 cases had no subsequent chemotherapy. Two cases with advanced stage (stage II) ovarian cancer underwent therapeutic abortion.

Early termination of pregnancy does not improve the outcome of ovarian cancer. However, if the pregnancy is 34 weeks of gestation or greater, termination of pregnancy should be performed to avoid fetal exposure to maternal chemotherapy.

In conclusion, ovarian cancer in pregnancy is rare. Ultrasound screening can detect an abnormal adnexal mass during pregnancy. Thus, early diagnosis and management of ovarian cancer can prevent the complications of ovarian cancer in advanced stages.

ACKNOWLEDGMENTS

We would like to thank the staff at the statistical unit, Siriraj Hospital, who provided the data for this study.

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