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Pregnancy in patients with cancer

Przebieg ciąży i porodu u pacjentek z rozpoznaną chorobą nowotworową

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Summary

We analyzed 12 cases of pregnant women divided into two separate groups: tumor diagnosed and treated before pregnancy and tumor diagnosed during pregnancy. Increasing number of simultaneous incidence of cancer and pregnancy is probably related to higher childbearing age. Our results suggest that cancer diagnosed both during and before pregnancy does not necessarily result in poor maternal and neonatal outcome.

Key words: **pregnancy** / **neoplasm** / **fertility preservation after chemotherapy** / / **chemotherapy during pregnancy** / **surgery during pregnancy** /

Streszczenie

W niniejszej pracy opisano grupę 12 pacjentek ciężarnych - z rozpoznaną i leczoną w przeszłości chorobą nowotworową oraz z rozpoznaną chorobą nowotworową w czasie ciąży. Najbardziej prawdopodobną przyczyną rosnącej liczby rozpoznań choroby nowotworowej w ciąży, jest coraz późniejsze planowanie zajścia w ciążę. Wyniki przeprowadzonych obserwacji sugerują, że możliwe jest korzystne rokowanie dla matki oraz urodzenie zdrowego noworodka, pomimo zachorowania na chorobą nowotworową przed ciążą lub w czasie ciąży.

Słowa kluczowe: **ciąża** / **choroba nowotworowa** / **zachowanie płodności po leczeniu chemioterapią** / **chemioterapia w czasie ciąży** / / **operacje chirurgiczne w czasie ciąży** /

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Introduction

Cancer during pregnancy is not common. It usually represents complex scenarios, depending on severity of diagnosis and complexity and difficulty of the therapy. Approximately 0,1% of all pregnancies are complicated with neoplasms and the prevalence will most likely rise as women are delaying pregnancy until later in life, when the risk of developing cancer increases. The care of a pregnant woman with neoplasm involves evaluation of often competing maternal and fetal risks and benefits. This case-based article illustrates the most common problems encountered in management of pregnancy complicated by cancer.

Material and methods

The aim of the study was a retrospective analysis of pregnant females with neoplasms, hospitalized in the 1st Department of Gynecology and Obstetrics, Medical University of Warsaw, between January 2007 and December 2009. During that time there were 12 admissions of pregnant women with neoplasms. We divided all patients into two separate groups, one with history of cancer and the other with cancer diagnosed during current pregnancy.

Pregnancy in patients with cancer diagnosed and treated before pregnancy

We identified 6 pregnant females previously diagnosed with cancer, two cases of astrocytoma, one case of thyroid gland carcinoma, one case of colorectal cancer, one case of acute lymphoblastic leukemia (ALL), and one case of liver tumor. (Table I).

In two cases the recurrence of malignancy during pregnancy was diagnosed. In patient with colorectal cancer toracotomy due to lung metastases was performed twice, at 15 and 19 weeks gestation. In the female with astrocytoma there was a suggestion of tumor recurrence in 28 weeks gestation. She was treated conservatively and tumor regression was observed on imaging tests during puerperium.

There were no serious obstetrical and neonatal complications in all analyzed cases of patients with cancer diagnosed before pregnancy.

Carcinoma during pregnancy

We analyzed 6 cases of pregnant patients admitted to the 1st Department of Gynecology and Obstetrics, Medical University of Warsaw, with malignant tumors diagnosed during pregnancy. (Table II).

There were three cases of breast neoplasm, one of colorectal cancer, one patient with adrenal gland tumor and a single case of cervical carcinoma. Five out of six pregnancies resulted in term delivery of a healthy neonate. There were no congenital malformations reported in infants born to patients treated with chemotherapy during pregnancy. It should be underlined that there were also no complications noted in the female patient that underwent oncologic surgical treatment during pregnancy.

One case that needs a more detailed description is that of a 34-year-old female with colorectal cancer diagnosed at 23 weeks gestation with metastases to liver and a 10mm coin lesion in the lung in chest X–ray. Due to abdominal and back pain continuous epidural opioid analgesia was applied.

Table I. Pregnancy in patients with cancer diagnosed before pregnancy.

	Age	Parity	Tumor type / Therapy	Obstetrical complications	Delivery / Neonate
1.	29	Primipara	Liver tumor (hemangioendothelioma). Liver tumor diagnosed 6 months before pregnancy.	Gestation diabetes.	Caesarean section at 37 weeks gestation. Birth weight 2700g, Apgar score 10. No complications at discharge.
2.	35	Gravida 3 Para 3	Colorectal cancer Surgery and chemotherapy 3 years before pregnancy. Toracotomy because of lung metastases with metastasectomy at 15 and 19 weeks of gestation.	Polyhydramnion.	Vaginal delivery at 38 weeks gestation. Birth weight 3580g, Apgar score 10. No complications at discharge .
3.	28	Gravida 2 Para 2	Astrocytoma. Brain surgery at the age of 13.	No complications.	Caesarean section at 37 weeks. Birth weight 3040g, Apgar score 10. No complications at discharge.
4.	32	Gravida 3 Para 3	Astrocytoma. Brain surgery, radiotherapy and chemotherapy 2 years before pregnancy. Suspicion of tumor recurrence at 28 weeks gestation.	Transient monoparesis at 28 and 37 weeks gestation.	Caesarean section at 37 weeks. Birth weight 3120g. Apgar score 10. No complications at discharge. Tumor regression in puerperium.
5.	26	Primipara	Acute lymphoblastic leukemia (ALL). Remission since the patient was 8 years old.	No complications.	Vaginal birth at 40 weeks gestation. Birth weight 2700g. Apgar score 9. No complications at discharge.
6.	27	Primipara	Thyroid gland papillary cancer. Total thyroidectomy with lymph node dissection 6 years before pregnancy.	No complications.	Caesarean section at 38 weeks gestation. Birth weight 3280g. Apgar score 10. No complications at discharge.

Table II. Patients diagnosed with carcinoma during pregnancy.

	Age	Parity	Tumor type / Therapy	Obstetrical complications	Delivery / Neonate
1.	34	Gravida 2 Para 2	Colorectal cancer. Metastases to liver and lungs. Palliative surgery combined with chemotherapy after delivery.	Admitted to the hospital at 23 weeks gestation because of rectal bleeding. Deep vein thrombosis.	Intrauterine fetal death at 27 weeks gestation. Induction of labor. Birth weight 1190g. Patient died 10 weeks after delivery.
2.	26	Gravida 2 Para 2	Breast cancer. Chemotherapy during pregnancy.	No complications.	Caesarean section and mastectomy at 37 weeks gestation. Birth weight 3450g. Apgar score 10. No complications at discharge.
3.	34	Gravida 2 Para 2	Breast cancer. Mastectomy and chemotherapy during pregnancy.	No complications.	Caesarean section at 39 weeks gestation. Birth weight 2490g. Apgar score 9. No complications at discharge.
4.	20	Primipara	Phyllodes tumor.	No complications.	Caesarean section with tumorectomy at 36 weeks gestation. Birth weight 2770g. Apgar score 10. No complications at discharge .
5.	32	Gravida 3 Para 3	Cervical cancer (preinvasivum).	No complications.	Vaginal birth at 38 weeks gestation. Birth weight 3780g. Apgar score 10. No complications at discharge.
6.	21	Primipara	Adrenal gland tumor. Laparoscopy with adrenalectomy at 24 weeks gestation.	Cushing's syndrome secondary to adrenal gland tumor.	Vaginal birth at 37 weeks gestation. Birth weight 3180g. Apgar score 10. No complications at discharge.

At 27 weeks of gestation ultrasound examination revealed intrauterine fetal death and an induction of labor was decided. Few weeks later the patient underwent palliative surgery combined with chemotherapy. She died 10 weeks after the delivery.

Discussion

Malignancy associated with pregnancy seems to challenge clinicians more and more frequently nowadays. According to available data the incidence of cancer in pregnant women is estimated to be 1 in 1000 [1]. The prevalence of malignancy in pregnant population observed between 2007 and 2009 in the 1st Department of Gynecology and Obstetrics, Medical University of Warsaw, was 12 in 3200 (3.75 in 1000). Only one out of 12 cases of pregnant females with neoplasm was complicated by intrauterine fetal death at 27 weeks gestation and the death of the mother 10 weeks after the delivery.

There are various publications suggesting different incidence of cancer during pregnancy. According to the majority of authors, the most common malignancies are: cervical carcinoma, breast cancer and malignant melanoma. The increasing number of cancer diagnosed during pregnancy is probably associated with women's decision to delay childbearing to a later age.

It seems that also the number of pregnant cancer-survivors will increase as modern oncologic therapies are developed (2). Contemporary treatment of neoplasms not only gives our patients hope for a longer life but also improves its quality, which raises the question of their future fertility. A new term 'oncofertility' was coined, which refers to a new interdisciplinary field exploring reproductive options for cancer patients [3].

There is a variety of a new fertility preserving techniques [4, 5, 6] and successful pregnancy after cancer therapy is possible. According to our findings, in all analyzed patients cancer diagnosed in the past did not affect pregnancy after appropriate therapy. It has to be underlined that cancer therapy and different surgical procedures may determine the mode of future delivery (either planned vaginal birth or elective Caesarean section).

The diagnosis of cancer during pregnancy is always a serious challenge for doctors, patients and their families. Despite its relatively rare occurrence, it deserves particular attention of care providers. The diagnosis of neoplasms is often delayed if cancer-related symptoms are confused with easily-neglected physiological changes of pregnancy. Moreover, some diagnostic procedures are regarded as contraindicated in pregnant women, which results in the delay of accurate diagnosis. It seems that in the majority of cases pregnancy outcome is not worsened by the malignant disease, although cancer treatment and pregnancy management is more complicated and requires more attention. Cancer therapy may be associated with potential risk and adverse effects for the fetus and the patient [7, 8].

Therapy for cancer which occurred during pregnancy may be life-saving for the patient, but may be life threatening for the developing fetus. It is not always possible to delay chemotherapy until after the delivery. The effect of chemotherapy on the fetus depends most of all on the trimester of pregnancy.

Exposure to chemotherapy agents during the first trimester is related with increased risk of spontaneous abortion, fetal death and major malformations [9]. Chemotherapy agents which easily cross the placenta may cause permanent organ malformations involving the central nervous system, eyes and bones, if the therapy is performed in the first trimester of pregnancy [2]. In particular cases, pregnancy termination may be considered. One of the most common adverse effects of chemotherapy during second and third trimester is probably intrauterine growth restriction and low birth weight. Some publications report neutropenia and anemia in neonates as a result of chemotherapy [9].

Maternal side effects include different consequences of myelosuppression: increased risk of infections, neutropenia, anemia and excessive hemorrhage during delivery. Depending on the type of chemotherapy, various drugs may cross the placenta resulting in high fetal plasma concentration or may cumulate in the placenta, resulting in the damage of placental function. High placenta concentrations have been described for doxorubicin [9].

In vast majority of cases radiotherapy is contraindicated, as most patients will experience spontaneous abortion upon reaching 40 Gy [10]. High-dose irradiation may predispose to low-birthweight infants. [11]

According to available data surgery is considered safe during pregnancy [12, 13]. The most common non-obstetric causes of surgery during pregnancy are appendicitis, adnexal mass and cholecystitis [11]. Surgery performed in pregnant women is not related with an increased maternal and perinatal mortality, but may be associated with an increased risk of preterm delivery [12]. Laparoscopy is a safe and effective treatment in pregnant patients, but the choice of surgical approach (laparoscopy vs. laparotomy) should be determined by the skills of the surgeon.

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