

An unusual hotspot in a young woman with Hodgkin's lymphoma

A young woman has started cancer treatment because of a Hodgkin's lymphoma. After four months of chemotherapy, a PET scan showed an unexplained hotspot in the right lower abdomen. This was later explained by an unsuspected pregnancy. Our case emphasizes the importance of a pregnancy test in all women in the reproductive age before starting cancer treatment.

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Introduction

Malignancy during pregnancy is thought to be extremely rare. However, in the USA, 1 of any 1000 pregnancies is accompanied by a malignancy.¹ Similar to the incidence of malignancies of women in the reproductive age, the most common malignancies are of the cervix, breast and skin, and hematological malignancies e.g. leukemia and malignant lymphoma.²

The combination of malignancy and pregnancy is a major challenge for both the patient and the doctor. The choice of immediate treatment of the malignancy is often favorable for the pregnant woman but may be harmful for the fetus. Different treatment options are possible after diagnosing a malignancy during pregnancy, such as a therapeutic abortion, starting chemotherapy and/or radiotherapy while still carrying the fetus or postponing treatment until the baby is born. Few studies exist with conclusive outcomes about the risk for the (unborn) child of different treatment regimens for a malignancy in pregnant women. In general however, chemotherapy is contraindicated in the first trimester of pregnancy.^{1,3}

We describe a young woman with an unusual hotspot on PET scan during treatment for a Hodgkin's lymphoma. The hotspot was later explained by an unsuspected pregnancy illustrating the importance of performing a pregnancy test in all women in the reproductive age before treatment of malignancies.

Case report

An 18-year-old woman was referred to our hospital after being diagnosed with nodular sclerosing Hodgkin's lymphoma stage IIA, localized in the mediastinum and neck. The planned therapy was four courses of ABVD chemotherapy followed by 30 Gray involved field radiotherapy. Four months after the start of ABVD-chemotherapy, an ¹⁸F-deoxy-D-glucose (FDG) Positron Emission Tomography (PET) scan was made for re-evaluation. The PET scan showed no abnormal uptake at the originally involved sites, however an unexplained focal accumulation (hotspot) was found in the right lower abdomen (arrow). Six weeks later, the woman complained of abdominal distension. An ultrasound showed an unsuspected pregnancy with an estimated gestational age of 30 weeks. In retrospect, the hotspot reflected FDG accumulation in the fetal myocardium. The chemotherapy was

given between the 8th and 26th week of gestational age. The PET scan was made in the 24th week of gestational age. After 31 weeks of gestation, the patient developed a HELLP syndrome. A girl was born by caesarian section without congenital abnormalities. At 6 years of age, she apparently has a normal development.

Discussion

Our case shows a very unusual clinical picture of a PET scan with a very intriguing outcome.

FDG uptake in fetal myocardium reflects the high myocardial metabolic rate. In fetal myocardium, beta-oxidation of free fatty acids is not possible and therefore oxidation of glucose is the main source of ATP-generation in fetal myocardium.

It emphasizes the importance of a pregnancy test in all women in the reproductive age before starting cancer treatment. Beside this, it shows the need of an inquiry for possible pregnancy before administering radio-pharmaceuticals to premenopausal woman. In case of doubt a pregnancy test should be performed. Despite the chemotherapeutics and the radio-pharmaceuticals administered during the first and second trimester of the pregnancy, the child is developing very well. There does not exist much evidence about the influence on the fetus of chemotherapy or the administration of radio-pharmaceuticals for diagnostic purposes during pregnancy. Different than most other case reports,^{1,3,4} we show a favorable outcome for the child after ABVD regimens given during the first trimester of pregnancy. With respect to the radiation burden of a FDG study for the fetus, the radiation dose to the fetus is considered too low to justify a routine pregnancy test in all premenopausal women according to Dutch nuclear medicine guidelines.⁵ FDG has been found to cross the placenta and to accumulate in fetal brain, heart, and bladder in a monkey study.⁶ Healthy monkeys were born but the clinical significance remains uncertain.

If the pregnancy had been known before starting the chemotherapy, a difficult decision had to be made. Was there enough time to delay treatment till after birth, even if pregnancy was terminated early by caesarian section?



Figure 1. PET scan shows an unexplained focal accumulation found in the right lower abdomen (arrow).

Or would the decision be the same taking into consideration the risks for the fetus?

As little evidence exists on this subject,^{4,7} we would like to emphasize the importance of more research on this subject and a better registration of concurrent pregnancy and malignancy.

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