

Acute Myeloid Leukemia and Pregnancy about a Case and Review of the Literature

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Abstract

Summary: The management of acute myeloid leukemia (AML) during pregnancy remains a clinical challenge for oncologists, obstetricians, patients and their families. Although the incidence of AML during pregnancy is low at 1 in 75,000 pregnancies, cancer is the second most common cause of maternal death behind pregnancy-related vascular complications. Due to the small number of patients diagnosed, there are only retrospective reviews and case series to guide complex management decisions. **Case Report:** A 35-year-old woman presented to our facility at 32 weeks' gestation after being found to have hyperleukocytosis, neutropenia, and anemia during a routine antenatal evaluation. Bone marrow aspiration demonstrated a diagnosis of AML. The blast population compromised 93% of the cellular elements.

Keywords: Leukemia, lymphoblastic, myeloid, acute, pregnancy, chemotherapy, interdisciplinary therapeutic approach, anemia, bone marrow examination.

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INTRODUCTION

Acute leukemia (AL) is a malignant blood disease that originates either in myeloid cells (acute myeloid leukemia, AML) or lymphoid cells (acute lymphoblastic leukemia, ALL). Leukemia in pregnancy is rare, two thirds are myeloid and one third are lymphoblastic. Its incidence is 1 in 75,000 to 100,000}. Represents the second cause of maternal death after vascular complications related to pregnancy [1-7]. The frequency and localization are comparable to those of the non-pregnant woman of the same age. Acute leukemia ranks third after breast and cervical cancer in association with pregnancy (1). And His treatment is a clinical dilemma. Hence the importance of initiating chemotherapy as soon as possible. Controlled studies of leukemia in pregnancy are very limited given its nature, and most data comes from analysis of case reports.

OBSERVATION

35-year-old patient, G4P1, ANTCD of two miscarriages and vaginal delivery with notion of gestational diabetes, consults for pain in both upper and

lower limbs resistant to analgesics then the appearance of intense parieto-temporal headaches with appearance of purplish erythematous subcutaneous nodules evolving in a context of weight loss of 6 kg. The examination objectified mucocutaneous pallor, and biological exploration objectified HB: 7.9 VGM: 95 CCMH: 34.6 GB: 90650 PNN: 1810 LYM: 3630, Blood smear: the rate of blasts is 93% (large blasts with a nucleocytoplasmic ratio of 0.6, agranular basophilic cytoplasm sometimes vacuole, loose chromatin) the cytochemical reaction to myeloperoxidase is negative in 100% of the blasts. A myelogram carried out objectified: Presence of 80% of blasts. And bone marrow immunophenotyping carried out on a blast population of 79% is that of an acute myeloid leukemia with à monocytic component. Brain MRI: increased pituitary hemorrhagic size in favor in the clinical context of a pituitary apoplexy Spinal MRI: discodiscarthrosis ranging from C3 to C7 with median disco-osteophytic prominence in C4-C5, C5-C6 and C6-C7 without signs of spinal cord pain Hospitalized in our training for suspected threat of premature delivery at 32 weeks of amenorrhea, pulmonary maturation received, a cesarean section was scheduled at 34 weeks

of amenorrhea. Extraction of a morphologically normal female newborn, Apgar 10/10 PDN: 1800 g hospitalized in the neonatology department for prematurity. The post-operative follow-up is simple, patient then transferred to Medicine A ibn Sina hospital for additional care.

DISCUSSION

We report here the diagnosis, treatment and outcome of our case of acute myeloid leukemia during pregnancy, within our department. The clinical picture of AML presenting during pregnancy is similar to that of non-pregnant women and the diagnostic criteria are those defined in the WHO classification of myeloid tumors [20, 21]. Overlapping of some common symptoms reported during pregnancy, such as fatigue and shortness of breath, or physiological alteration of peripheral blood counts, such as anemia and thrombocytopenia, could delay diagnostic suspicion and appropriate treatment. In this respect, the main differential diagnoses to be considered are thrombotic microangiopathy, HELLP syndrome and cytopenias of immune deficiency or origin [7]. Acute leukemia may present with hyperleukocytosis, thromboses or disseminated intravascular coagulation, in the context of a thrombogenic milieu associated with gestation [1-5]. Thrombosis could affect placental vessels, impairing fetal growth and survival [28, 29]. Intrauterine death can also be the result of hypoxia caused by placental ischemic infarction and leukemic infiltration [1-5]. Investigations essential for correct differential diagnosis should include complete blood count and blood smear, measurement of vitamin B12, folate and ferritin, screening for coagulation and hemolysis, kidney function tests and hepatic [7]. When a diagnosis of leukemia is suspected, bone marrow samples should be obtained and morphological, immunophenotypic, cytogenetic, and molecular analyzes performed to enable accurate subtyping and correct prognosis, according to published guidelines [30]. AML associated with pregnancy is rare and only small series of patients have been reported [1-15]. Anti-leukemic therapies during pregnancy may differ from the golden rules, being conditioned by several variables, including gestational age at diagnosis, clinical and biological features of the disease, and potential toxic effects of drugs on the mother and the Child [6-15]. Fetal toxicity of cytostatic therapy clusters during the first trimester..]. During the first trimester, chemotherapy results in fetal death in about 40% of cases, while the percentage is around 10% during the second trimester and almost all infants who have been exposed to chemotherapy during third trimester were born alive without major malformations, despite cases of growth retardation, intellectual disability, decreased fertility, and hematopoietic suppression have been reported [1-7, 15-24]. In most of the cases described, patients diagnosed during the first trimester underwent an abortion and were subsequently treated with induction chemotherapy [6-15]. In the few cases treated with

chemotherapy during the first trimester, poor pregnancy outcomes have been reported with congenital anomalies and miscarriages, while it has been suggested that a prolonged delay in initiation of treatment may be associated with poorer maternal outcome [6-15]. When a diagnosis of AML associated with pregnancy is made, a multidisciplinary team must be assembled to coordinate all diagnostic and therapeutic steps, including the planning of a caesarean section before or between courses of chemotherapy and after reconstitution of the marrow. Maternal bone, to avoid and neonatal pancytopenia. To minimize risk to mother and fetus, short-term cesarean delivery (>35–37 weeks) remains the primary goal. Survival after delivery at or beyond 28 weeks gestation is >90% in most major centers, but even higher (>95%) if delivery was at or beyond 32 weeks gestation [7]. If it is possible to delay the initiation of the treatment program, a caesarean section should be planned before chemotherapy, or when peripheral blood counts resume after the treatment cycle. Chemotherapy should not be given after the 35th week of pregnancy [1-7]. Intensive ultrasound monitoring is essential to document fetal growth, development, cardiac function, and placental status, as well as daily topographic assessment. When delivery is necessary at an earlier gestational age (before 34 weeks), pharmacological improvement of fetal lung maturation with corticosteroids should be considered [7]. Breastfeeding is contraindicated during the anti-leukemic program maternal [7]. The use of hydroxycarbamide before the start of induction chemotherapy should be avoided except in the case of hyperleukocytosis (leukocytes greater than $100 \times 10^9/L$) [7]. Monitoring of the patient's cardiocirculatory parameters, blood formula, coagulation status and electrolyte balance, as well as the heart function of the fetus (cardiotocography) must be guaranteed throughout the procedure.

CONCLUSION

The case described here represented a clinical challenge for our establishment which forced us to set up a multidisciplinary team associating hematologists, obstetricians, anesthetists and paediatricians/neonatologists, in order to properly manage all the phases of diagnosis and treatment of leukemia, as well as those concerning pregnancy and newborn. Initiating chemotherapy as early as possible can increase the cure rate, if chemotherapy is given during pregnancy extensive and continuous monitoring of fetal vital signs, heart function and birth defects is mandatory in order to diagnose and quickly treat emerging complications related to the disease or treatment. Therapeutic approaches for leukemia in pregnancy may be conditioned by several variables, including gestational age at diagnosis, clinical and biological features of the disease, and potential drug toxicity on mother and child [16-21].

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