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Acute Myeloid Leukemia in Pregnancy: A Case Report and Review of Literature

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ABSTRACT
Background: Acute myeloid leukemia (AML) is a rare but life-threatening hematologic malignancy complicating pregnancy. With an incidence of 1 in 75,000 pregnancies, it poses diagnostic and therapeutic dilemmas for clinicians.
Case: We report a 36-year-old primigravida conceived by intrauterine insemination (IUI) who presented at 30 weeks with impending eclampsia and bleeding manifestations. Investigations revealed severe anemia, thrombocytopenia, and circulating blasts. Bone marrow confirmed AML-M4 with inversion 16. She was managed with a multidisciplinary team, received induction chemotherapy (daunorubicin and cytarabine), and underwent emergency lower segment cesarean section (LSCS) at 35 weeks, delivering a live infant. Postoperatively, she developed necrotizing fasciitis and sepsis but improved with aggressive supportive management.
Conclusion: AML in pregnancy requires balancing maternal survival with fetal viability. A coordinated multidisciplinary approach and individualized timing of chemotherapy and delivery remain the cornerstones of management.
Keywords: Acute myeloid leukemia, Pregnancy, Eclampsia, Cytopenias, Chemotherapy

I. INTRODUCTION

Leukemia is the second most common hematologic malignancy diagnosed in pregnancy after lymphoma, with acute myeloid leukemia (AML) being more frequent than acute lymphoblastic leukemia. The estimated incidence of AML in pregnancy is 1 in 75,000 to 100,000 pregnancies. Although rare, the condition significantly threatens both maternal and fetal health.

AML is characterized by clonal proliferation of immature myeloid precursors, leading to cytopenias, bone marrow failure, and systemic complications. In pregnancy, overlapping clinical features such as anemia, fatigue, and bleeding may be misattributed to gestational changes, delaying diagnosis.

Management is challenging because chemotherapy, though life-saving, may jeopardize fetal development, especially in the first trimester. Decision-making depends on gestational age, maternal condition, fetal viability, and patient preferences. Literature is largely limited to retrospective series and case reports, underscoring the importance of reporting individual cases to enrich clinical understanding.

II. CASE REPORT

A 36-year-old South Indian primigravida conceived by IUI presented at 30 weeks gestation with complaints of generalized edema, headache, and vaginal bleeding. She had no significant past medical history but was obese and primigravid at advanced maternal age.

On examination, her blood pressure was 160/100 mmHg, consistent with impending eclampsia. She had pallor, generalized edema, and mild hepatomegaly. Obstetric evaluation revealed a relaxed uterus and reactive non-stress test (NST).

Investigations
- Hemoglobin: 6 g/dl
- Total leukocyte count: 58,000 / cu mm
- Platelets: 16,000 / cu mm
- ESR: 65 mm/hr
- Peripheral smear: Normocytic normochromic anemia with thrombocytopenia and circulating immature blasts
- Renal and liver function tests: Normal
- Urine albumin: 2+

Bone marrow aspiration confirmed AML M4 (acute myelomonocytic leukemia) with inversion 16, a favorable prognostic marker.

Management
- Multidisciplinary team: Hematology, medical oncology, obstetrics, neonatology, and anesthesiology.
- Counseling: Extensive counseling provided to the patient and family regarding maternal prognosis, fetal risks, and treatment options.

- Chemotherapy: Induction therapy started with daunorubicin and cytarabine.
- Fetal surveillance: Serial ultrasounds and CTG were performed for growth and well-being.

At 35 weeks, due to failed induction of labor and worsening maternal status, an emergency LSCS was performed.
Infant: Female, 2.3 kg, APGAR 5 and 6 at 1 and 5 minutes respectively, morphologically normal.

Postoperative Course

The patient developed necrotizing fasciitis at the surgical site, complicated by sepsis and urinary tract infection.
- Managed with broad-spectrum antibiotics, antifungals, surgical debridement, and intensive supportive care.
- Gradual improvement was noted, and she was stabilized for continuation of oncology care.

III. DISCUSSION

AML during pregnancy represents a therapeutic conundrum. The dual goals are:
1. Maximizing maternal survival.
2. Minimizing fetal harm from chemotherapy and prematurity.

Epidemiology & Clinical Impact:
- AML is the most common leukemia in pregnancy, typically diagnosed in the second or third trimester.
- Symptoms often overlap with gestational changes (anemia, fatigue), delaying diagnosis.

Maternal Complications:
- Cytopenias predispose to severe infections, bleeding, and organ dysfunction.
- Obstetric risks include preeclampsia, HELLP syndrome, and placental abruption.

Fetal Risks:
- Miscarriage and congenital malformations if chemotherapy is given in the first trimester.
- Intrauterine growth restriction, preterm delivery, stillbirth, and neonatal cytopenias.

Chemotherapy During Pregnancy:
- Anthracycline-based regimens (daunorubicin, idarubicin) with cytarabine remain the standard.
- Second and third trimesters are relatively safer for chemotherapy, as organogenesis is complete.
- Timing of delivery should balance fetal maturity with maternal urgency.

Review of Literature:
- A recent meta-analysis reported overall survival in pregnant women with AML at 30%, with live birth rates of 87% and neonatal complication rates of 16%.
- Documented neonatal issues include congenital anomalies (PDA, VSD, hydrocephalus), cytopenias, and respiratory distress.
- Favorable cytogenetics such as inversion 16 confer better maternal prognosis.

Learning Points from Our Case:
- Importance of early suspicion and diagnostic evaluation in atypical presentations.
- Role of a multidisciplinary team in optimizing both maternal and neonatal outcomes.
- Timely initiation of chemotherapy with careful fetal monitoring.
- Anticipation of postoperative infectious complications in immunocompromised patients.

IV. CONCLUSION

Acute myeloid leukemia in pregnancy is rare but requires urgent multidisciplinary care. Individualized management is crucial, guided by gestational age, maternal condition, and cytogenetics. Chemotherapy during the second and third trimesters can be life-saving without significant teratogenicity. Early diagnosis, close monitoring, and a carefully timed delivery are essential to improve survival outcomes. More prospective studies and standardized guidelines are needed for chemotherapy protocols in pregnancy.

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