ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

MANAGEMENT OF PREGNANCY IN PATIENTS WITH ACUTE LEUKEMIAS: MODERN APPROACHES AND CLINICAL RECOMMENDATIONS

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Abstract: Oncological diseases remain one of the leading causes of mortality worldwide. According to WHO data (2020), approximately 19 million new cases of malignant neoplasms are diagnosed annually, with hematologic malignancies accounting for 2.5% of all cases. Acute leukemias (AL) are aggressive forms of blood cancer characterized by rapid progression and high lethality. Pregnancy in such patients was long considered incompatible with life; however, modern medical advances now make it possible to preserve both maternal and fetal lives with timely diagnosis and competent treatment.

Introduction.

The onset of AL during pregnancy is rare (1 case per 75–100 thousand pregnancies) but requires immediate intervention. Previously, termination of pregnancy was considered mandatory; today, the focus has shifted toward prolonging gestation alongside chemotherapy. This article reviews key aspects of diagnosis, treatment, and pregnancy management in AL patients based on an interdisciplinary approach.

Etiology and Epidemiology.

Acute leukemias are divided into two main types:

Acute Lymphoblastic Leukemia (ALL) — accounts for 30% of cases, more commonly diagnosed in children.

Acute Myeloid Leukemia (AML) — predominant in adults (70% of cases).

Research shows that AL in pregnancy is most often diagnosed in the 2nd and 3rd trimesters (77% of cases) due to physiological blood changes that mask early symptoms. Diagnosis in the 1st trimester occurs in only 23% of cases, complicating management due to embryonic risks.

Diagnosis: Challenges and Solutions.

Pregnancy presents unique diagnostic challenges. Physiological changes (anemia, thrombocytopenia, fatigue) are often interpreted as normal, leading to delayed AL diagnosis.

Key methods:

Bone marrow aspiration — safe for the fetus, performed under local anesthesia.

ISSN: 2692-5206
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Lumbar puncture — used to rule out neuroleukemia.

Laboratory tests — peripheral blood analysis, cytogenetic testing.

Fetal ultrasound monitoring — essential during chemotherapy to assess development.

It is crucial to differentiate AL symptoms from gestational changes. For example, dyspnea in leukemia may be accompanied by blasts in the blood, not just anemia.

Treatment Strategy by Trimester.

Treatment choice depends on gestational age, leukemia type, and patient condition.

1st Trimester: High Risk.

The organogenesis period (weeks 3–10) is highly vulnerable to chemotherapy.

Recommendations:

For AML and ALL, termination should be considered to start aggressive therapy.

If the patient refuses abortion, gentle regimens (e.g., cytarabine + doxorubicin) may be used.

Avoid retinoids (ATRA) and arsenic trioxide (ATO) due to teratogenic effects.

Statistics:

40% end in spontaneous abortion or missed miscarriage.

14% of infants develop birth defects with ATRA exposure.

2nd and 3rd Trimesters: Optimizing Therapy.

After 12 weeks, fetal risks decrease.

Treatment regimens:

AML: anthracycline (daunorubicin) + cytarabine.

ALL: vincristine + L-asparaginase-based protocols.

Acute Promyelocytic Leukemia (APL): ATRA is permitted, but only after the 1st trimester.

Monitoring:

Regular ultrasounds to evaluate fetal growth and placenta condition.

Fetal heart monitoring (Doppler studies).

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AMERICAN ACADEMIC PUBLISHER
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Delivery: Balancing Risk and Safety

Timing and mode of delivery are individualized.

Selection criteria:

Maternal condition (hematologic remission, absence of infection).

Gestational age.

Presence of pancytopenia (platelets < 50×10^9/L indicates cesarean).

Tactics:

Vaginal delivery if maternal condition is stable.

Early delivery (<34 weeks): corticosteroids administered for fetal lung maturation.

Postpartum Period

Chemotherapy resumes 3–4 weeks postpartum to minimize hemorrhage risk.

Complications: Maternal and Fetal

For the mother:

Infections due to neutropenia.

Hemorrhagic syndrome.

Anthracycline-induced cardiotoxicity.

For the fetus:

Intrauterine growth restriction (40–50% of cases).

Premature birth (30%).

Congenital anomalies (mostly when treated in the 1st trimester).

Important: Chemotherapy complications are hard to distinguish from spontaneous mutations, so long-term follow-up of the child is required.

Prognosis and Outcomes

For the mother:

5-year survival rate in APL > 75%.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
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AML: 40–50% in patients under 40 years.

For the child:

With 3rd-trimester treatment, >90% are born without defects.

Long-term effects (neurological issues, immunodeficiency) are under study.

Success factors:

Early diagnosis.

Individualized drug selection.

Collaboration between hematologist and obstetrician-gynecologist.

Ethical and Clinical Dilemmas

Decisions on pregnancy continuation require careful consideration:

Ethical aspects: family pressure, religious beliefs vs. medical indications.

Clinical risks: delaying therapy worsens maternal prognosis but may save the fetus.

Case Example

A 28-year-old AML patient at 18 weeks' gestation refused abortion. Underwent 3 cycles of cytarabine-based chemotherapy. Delivered at 36 weeks — baby weighed 2400 g, no anomalies. Maternal remission ongoing for 2 years.

Conclusion.

Managing pregnancy in acute leukemia is a complex task requiring a multidisciplinary approach. Modern protocols allow for treating the mother while preserving fetal life, especially in the 2nd and 3rd trimesters. Early diagnosis, personalized therapy, and careful monitoring are key. Future studies should explore long-term chemotherapy effects on children and optimize treatment regimens.

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