

Multi-disciplinary management of an obstetric patient with acute lymphoblastic leukaemia

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Background

The occurrence of leukaemia in pregnancy is reported in 1/75,000 cases. The evidence for the management of haematological malignancy in pregnancy remains limited. A balance is required between foetal and maternal survival in these cases. Delaying chemotherapy can impact maternal outcomes and the likelihood of achieving a remission. However rapid disease progression in pregnancy can have significant consequences for mother and baby. The evidence available recommends a multi-disciplinary approach for the best outcomes.

Case Description

A 32 year old, normally well, Caucasian school teacher presented with a 12 week history of submental and cervical lymphadenopathy. At the time of review, she was a primigravida at 30+1 weeks with an uncomplicated pregnancy. She was subsequently diagnosed with acute T-lymphoblastic lymphoma (ALL), which rapidly evolved into T-lymphoblastic leukaemia. An urgent multi-disciplinary birth plan was devised involving obstetrics, anaesthetics and oncology leading to a semi-elective caesarean section under general anaesthesia at 33 weeks. A male infant was born in good condition and transferred to NICU due to gestational age. The patient was provided with level 2 care by a high dependency level midwife. Following post-surgical recovery, the patient was transferred to the acute haematology ward to start chemotherapy, as per the UKALL14 protocol.

What can we learn from this case?

Anaesthetic Considerations

1. **Neuraxial vs General anaesthetic:** Patients with ALL are more likely to develop thrombocytopenia or coagulation abnormalities. This is vitally important to check if neuraxial anaesthesia is being considered. With neuraxial anaesthesia and high blast cell counts, there is a theoretical risk of seeding cells into the CSF and should be discussed with oncology.
2. **Airway risks:** Patients with ALL may have significant lymphadenopathy potentially causing distortion of airway or tracheal anatomy. It is imperative to perform a thorough airway assessment and review of any available imaging for all patients.
3. **Intraoperative care:** Higher risk of obstetric hemorrhage due to increased bleeding risk. Preparation may include arterial lines, additional IV access, uterotonics and organizing blood products.
4. **Post-operative location of care:** Patient will likely need intensive nursing and midwifery care in the 48hrs after delivery. It may be more appropriate to admit the patient to HDU for post operative care.

Oncology Considerations

1. **Tumour lysis syndrome:** This can occur spontaneously or when starting chemotherapy. Prophylactic treatment includes allopurinol, rasburicase and ensuring good hydration.
2. **Transfusion requirements:** Patients with hematological malignancies often require transfusion of red blood cells or platelets. These may be required in preparation for surgery with target Hb >8 g/dl.
3. **Antimicrobial prophylaxis:** Cover is required for bacterial, viral and fungal infections. Additionally, surgical antimicrobial prophylaxis should be considered if the baby is born by instrumental delivery or cesarean section.
4. **VTE Prophylaxis:** Both pregnancy, malignancy and surgery can increase the risk of thromboembolic events. VTE prophylaxis should be started promptly whilst closely monitoring for thrombocytopenia
5. **Hyperviscosity syndrome:** This is more likely when WCC > 100 x 10⁹/L and close monitoring is required. Patients should be adequately hydrated and treatment may include supportive therapy, plasmapheresis and chemotherapy.

Obstetric Considerations

- **Timing of delivery:** There is a balance between optimizing maternal health and the fetal risks of preterm delivery. Ensure that the patient will be delivered in a centre with an appropriate level of neonatal care.
- **Mode of delivery:** Depending on parity and timing of delivery, consider whether caesarean section or induction of labour will be more likely to be successful and safe.
- **Fetal maturity:** Assessing fetal growth and development with growth scans prior to delivery. Steroids may be required for fetal lung maturation and for oncological pre-phase treatment.
- **Future fertility:** Recommendation for two years disease free before conceiving and therefore contraception will be required.

Conclusion

There was a successful outcome despite a complicated clinical case due to the hard work of the anaesthetic, obstetric and oncology teams. Although the patient was delivered earlier than expected due to disease progression, time was spent to ensure that thorough preparations were made perioperatively.