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Case Report

Management of newly diagnosed chronic myeloid leukaemia during a twin pregnancy using leucapheresis: Case report and review of the literature

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ABSTRACT

A case of chronic myeloid leukaemia diagnosed as an incidental finding in a 32-year-old woman, pregnant with twins at 11 weeks gestation, is presented. Management of the patient was with leucapheresis and supportive care until spontaneous delivery of two morphologically normal infants (one male, one female) at 37 weeks gestation. Special considerations while employing leucapheresis in pregnant patients are discussed.

Introduction

Presentation of chronic myeloid leukaemia (CML) during pregnancy is an uncommon phenomenon since the condition has low prevalence during child-bearing years, with a median age at presentation of 59 years old [1].

This rare case of a new diagnosis of CML occurring in a twin pregnancy was successfully managed with leucapheresis and supportive care. Special considerations to acknowledge when leucapheresis is chosen as a treatment strategy for pregnant CML patients are discussed.

Case report

A 32-year-old para 0+1 lady presented for routine obstetric care at 11 weeks gestation of a dizygotic twin pregnancy. Routine blood counts at obstetric booking visit revealed mild anaemia with a raised white cell count and platelet count.

Haemoglobin 110 g/L
Platelet count 581×10^9/L
White cell count 219×10^9/L

Differential morphology revealed 65% neutrophils, 7% myelocytes, 9% metamyelocytes and 3% basophils.

The patient was referred for an urgent haematology opinion. History taking revealed no symptoms of leucostasis. No splenomegaly was apparent on clinical examination.

Reverse transcriptase polymerase chain reaction was performed on a sample of peripheral blood and confirmed the presence of the BCR-ABL fusion protein. Cytogenetics revealed the presence of the Philadelphia fusion chromosome.

Having confirmed a diagnosis of chronic myeloid leukaemia, prognostic indices were assessed. Risk stratification using both the Sokal and Hasford scores yielded scores of 0.75 and 397.75 respectively, which assigned our patient into a low risk category.

Hyperleukocytosis is defined as a white blood cell count in excess of 100×10^9/L. It is associated with DIC, tumour lysis syndrome and leucostasis, and is known to be associated with poor outcomes in acute leukaemia. In light of a white cell count of this order in this patient, a pre-emptive cytoreductive strategy was pursued with the intention of preventing adverse events. Our patient was clear

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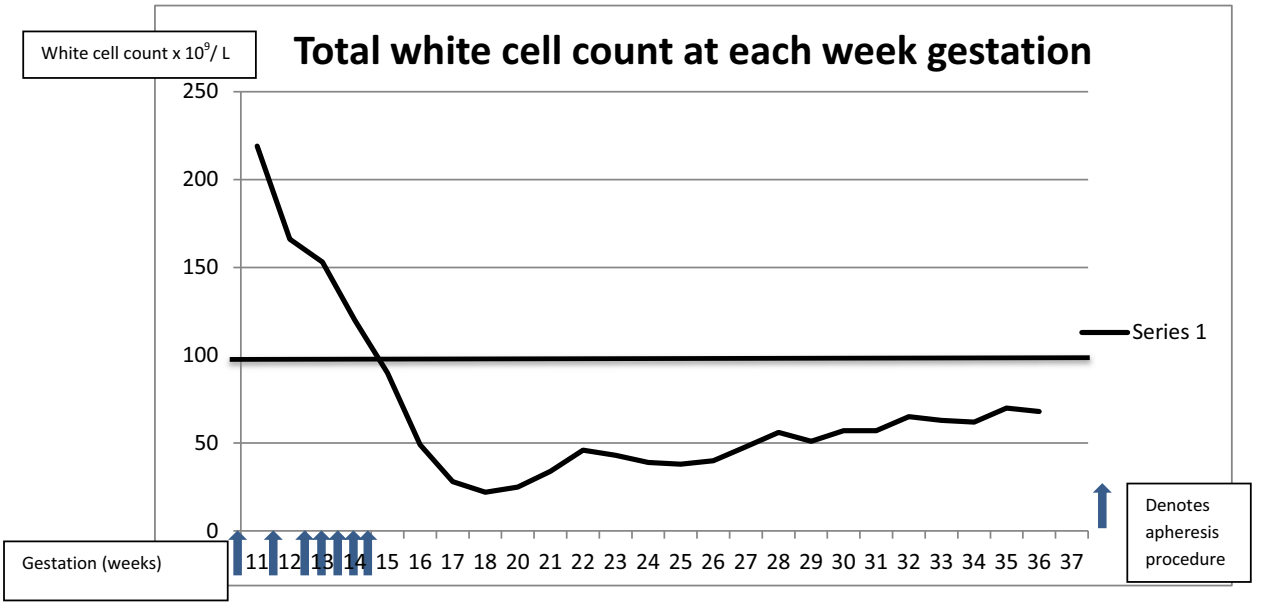

Fig. 1. This figure shows variation in white cell count as the pregnancy progressed, and the relation to apheresis procedures.

that she was unwilling to consider any drug therapy for management of her leukaemia during pregnancy. Apheresis was therefore the principle treatment modality available.

The aim was to achieve a white cell count under 100×10^9/L. Unfortunately, at the first session of leucapheresis, peripheral venous access was inadequate to facilitate the procedure and insertion of a right internal jugular line was required. A 14 SF × 19 cm tunnelled Palindrome line was inserted under ultrasound guidance. In light of the presence of an indwelling venous catheter in association with CML, thrombocytosis and the known significant thrombotic risk of a twin pregnancy, thromboprophylaxis was introduced with enoxaparin 60 mg once daily.

Leucapheresis was commenced on a weekly basis for 3 weeks with minimal improvement in white cell count. The white cell count remained over 100×10^9/L. From 13 weeks gestation, the frequency of apheresis procedures was increased to twice weekly until 16 weeks gestation when the total white cell count had been sustained under 100×10^9/L for two consecutive weekly measurements. Seven procedures were required in total (Fig. 1).

After 16 weeks gestation, the white cell count was measured on a weekly basis and continued to show a progressive decline until approximately 20 weeks, when a gradual upward trend recommenced. The white cell count did not subsequently exceed 100×10^9/L and no further apheresis procedures were performed after 16 weeks gestation.

The platelet count fell into the normal range after three apheresis procedures and remained normal thereafter.

Spontaneous labour occurred at 37 weeks gestation; a normal vaginal delivery resulted in delivery of one healthy male weighing 2.2 Kg and one healthy female infant weighing 1.9 Kg.

Following delivery, the patient agreed to commence tyrosine kinase inhibitor therapy without delay and elected not to breastfeed to facilitate this. Nilotinib was chosen as the first line agent. The dose employed was 300 mg twice daily.

Nilotinib was tolerated very well with no significant side effects or toxicities, and a complete haematological remission had been achieved by two weeks of treatment. Subsequent molecular follow-up revealed optimal response as defined by European Leukaemia Network guidelines, with BCR-ABL1 at 0.24% by 3 months of treatment and 0.07% at 12 months.

Discussion

CML in pregnancy is uncommon, with an estimated incidence of 1 per 100 000 pregnancies yearly [2], and pregnant patients are invariably excluded from clinical trials. These factors contribute to difficulty in formation of an evidence-based treatment strategy for pregnant patients with CML. The optimal management of such complicated cases must take into account published evidence including case reports in conjunction with expert opinion. Strategies must then be tailored towards the individual clinical circumstances and respect the wishes of the patient concerned. Close co-operation with obstetric colleagues is vital as the pregnancy progresses to achieve optimal outcomes. A balance between achieving good disease control in the mother, and maintaining safety of the foetus is the ultimate aim. In this review, we will discuss supportive management and consider the evidence base for leucocytapheresis as a treatment strategy for CML during pregnancy.

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