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Haematological problems in obstetrics

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Physiologic changes occur during pregnancy, which influence normal haematologic values and impact the diagnosis and management of haematologic disease in pregnancy. Physiologic changes of pregnancy also commonly lead to mimicking symptoms of haematologic disease that may prompt investigations for haematologic disease. The toxicity and radiation associated with the diagnostic imaging and pharmacologic management of both benign and malignant haematological conditions during pregnancy present unique challenges. Strategies for diagnosis and treatment must weigh the benefits and risks to the mother while also taking foetal outcome into consideration. In this review, we highlight the common haematologic diseases encountered by obstetricians and try to provide guidance for the most prevalent diagnostic and therapeutic questions. At the other end of the spectrum, we also comment on less common but very challenging haematologic diseases in pregnancy that require multidisciplinary effort to arrive at difficult individual diagnostic and treatment decisions.

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Normal physiologic changes in pregnancy

An understanding of normal physiologic adaptations during pregnancy is essential to identifying and managing haematological disease in pregnancy. By the 6th week of gestation, the plasma volume begins to rise until its peak at the 30th week of gestation leading to a dilutional effect on haemoglobin referred to as the physiological anaemia of pregnancy [1]. The haemostatic system is progressively activated to prepare for the haemostatic challenges of delivery (see Table 1). The hypercoagulability of pregnancy gradually returns to the non-pregnant state after the early post-partum period, as evidenced by progressive normalisation of markers of coagulation activation [2,3].

Bleeding disorders in pregnancy

Haemostatic disorders include congenital or acquired abnormalities in coagulation or platelet activity (number and function). The most common congenital bleeding disorder that affects women during pregnancy is von Willebrand disease (vWD). Other rarer conditions include haemophilia A (factor VIII deficiency), haemophilia B (factor IX deficiency), factor XI deficiency and congenital platelet function disorders. Delving into the details of the latter disorders is beyond the scope of this review, but it should be considered in the differential diagnosis of the patient with a bleeding history or family history. A thorough bleeding history is the most reliable means to identify patients with a congenital bleeding disorder. Acquired coagulation disorders are rare and include acquired platelet function disorders, acquired haemophilia and disseminated intravascular coagulation (DIC). Standardised bleeding assessment tools, which calculate a quantitative score compared to normal and abnormal populations, are useful for determining the need for additional haemostatic testing [4]. Initial screening blood work for patients with an abnormal bleeding history would include complete blood count (CBC), prothrombin time or international normalised ratio (INR), activated partial thromboplastin time, fibrinogen, von Willebrand testing (antigen level and functional testing) and factor VIII and factor IX levels.

von Willebrand disease

VWD is the most common inherited bleeding disorder with an estimated prevalence of 0.01–0.1% of the population. The two primary haemostatic functions of the von Willebrand factor (vWF) are

Table 1
Normal haematological changes in pregnancy.

Tests with values that increase during pregnancy
Fibrinogen (up to 3× baseline)
Leukocytes (WBC) (to 10–16 × 10^9/L)
Factor VIII (55–70% higher)
D-dimer (~2–3× by third trimester)
Ferritin
von Willebrand Factor (vWF) (~2–3× by third trimester)
Erythrocyte sedimentation rate (ESR) (~2–3× by third trimester)
Tests with values that are unaffected by pregnancy
Partial thromboplastin time (PTT)
International normalised ratio (INR)
Factor IX
Factor XI
Antithrombin (AT)
Protein C
Tests with values that decrease during pregnancy
Haemoglobin (Hb) (2–3 g/dL drop by second trimester)
Platelet count (~10% decrease)
Protein S free (30–54% lower)
A disintegrin and metalloproteinase with thrombospondin motifs (ADAMTS) (~25% drop by second trimester)