

[Newborn Care Manual: Contents](#)**TRAUMA****28-1 WHAT IS TRAUMA?**

Trauma means damage or injury. During delivery the infant may be damaged by pressure on the body as it passes down the birth canal. The infant may also be damaged by the person conducting the delivery, either during a vaginal birth or caesarean section..

28-2 WHICH INFANTS ARE AT AN INCREASED RISK OF TRAUMA?

1. PRETERM INFANTS who have delicate tissues that are easily damaged.
2. LARGE INFANTS where there is difficulty delivering the head and shoulders.
3. MALPRESENTATIONS, e.g. breech delivery where the infant has to be manipulated.
4. FORCEPS OR VACUUM DELIVERY where traction or suction is applied to the head.
5. UNASSISTED DELIVERIES where the infant may fall after delivery.
6. PRECIPITOUS DELIVERIES when the infant is delivered very fast.

28-3 WHAT ARE THE MAJOR TYPES OF TRAUMA?

1. Caput (i.e. caput succedaneum).
2. Cephalhaematoma.
3. Subaponeurotic haemorrhage.
4. Facial palsy.
5. Brachial palsy.
6. Bruising.
7. Fractures.
8. Lacerations.

28-4 WHAT IS CAPUT?

Caput (or caput succedaneum) is oedema of the presenting part caused by pressure on the presenting part during a vaginal delivery. It is usually of no clinical importance and disappears during the first 48 hours after delivery. You should explain this to the parents especially if the caput is large.

More severe caput, often with damage to the skin, may be present on the infant's head after a vacuum extraction (when it is called a chignon) or on the buttocks after a breech delivery.

28-5 WHAT IS A CEPHALHAEMATOMA?

A cephalhaematoma is a collection of blood under the periosteum of the parietal bone. It is common, may be unilateral or bilateral, and appears within hours of delivery as a soft, fluctuant swelling on the side of the head. A cephalhaematoma never extends beyond the edges of the bone and, therefore, never crosses suture lines.

Bleeding is caused by damage to capillaries under the periosteum of the parietal bone. This may occur during a normal vaginal delivery, but is more common with cephalopelvic disproportion or an assisted delivery.

28-6 WHAT IS THE TREATMENT OF A CEPHALHAEMATOMA?

Cephalhaematomas are usually small and need no treatment. The reabsorption of blood may cause jaundice, however, which may require treatment by phototherapy. It can take up to 3 months before the cephalhaematoma disappears. A bony ridge may form at the edge of the healing haematoma but this also eventually disappears without treatment. Never aspirate or drain a cephalhaematoma as this may introduce infection.

NEVER ASPIRATE OR DRAIN A CEPHALHAEMATOMA
--

28-7 WHAT IS A SUBAPONEUROTIC HAEMORRHAGE?

A subaponeurotic haemorrhage is a collection of blood under the aponeurosis of the scalp. The aponeurosis is a sheet of fibrous tissue connecting the muscle over the forehead with that over the occiput (back of the head). The subaponeurotic space is large and can contain a lot of blood. Fortunately a subaponeurotic haemorrhage is not common.

A subaponeurotic haemorrhage results from trauma to blood vessels crossing this space from the skull to the overlying scalp. It is almost always caused by a forceps delivery or vacuum extraction.

A subaponeurotic haemorrhage presents with:

1. **SHOCK AND PALLOR.** Shock presents with tachycardia, a low blood pressure and delayed capillary filling time. Within 30 minutes of the haemorrhage the haemoglobin and packed cell volume start to fall rapidly. There is a great danger that the infant will die of blood loss.
2. **A BOGGY SWELLING OF THE HEAD.** As the subaponeurotic space crosses the sutures, the blood is able to track over the whole head. A subaponeurotic haemorrhage gives a diffuse swelling of the head in contrast to the localised swelling in a cephalhaematoma. Sutures usually are not palpable. The amount of blood under the scalp is far more than is estimated. Within 48 hours the blood tracks between the fibres of the occipital and frontal muscles causing bruising behind the ears, along the posterior hair line and around the eyes.

IT IS IMPORTANT TO DIFFERENTIATE BETWEEN CAPUT, A CEPHALHAEMATOMA AND A SUBAPONEUROTIC HAEMORRHAGE

28-8 WHAT IS THE TREATMENT OF A SUBAPONEUROTIC HAEMORRHAGE?

The treatment consists of transfusing the infant with blood to replace the blood which has been lost. Into the subaponeurotic space. While waiting for the blood to arrive, transfuse with normal saline (or stabilized human serum or fresh frozen plasma, HAEMACCEL or PLASMOLYTE B) to correct the shock. Give Konakion 1 mg by intramuscular or intravenous injection to assist the liver to replace clotting factors which are lost with the haemorrhage.

A SUBAPONEUROTIC HAEMORRHAGE REQUIRES EMERGENCY TREATMENT TO REPLACE THE BLOOD LOSS

**** A subdural haemorrhage is a collection of blood in the subdural space. Severe moulding and marked traction on the head during delivery causes a tear in the large veins and sinuses draining blood from the brain. These vessels then bleed into the subdural space. A subdural haemorrhage is uncommon and is usually seen after a difficult forceps delivery or vacuum extraction in a woman with cephalopelvic disproportion. This form of trauma should be prevented.*

A subdural haemorrhage presents with:

- (i) Shock and/or anaemia due to blood loss.*
- (ii) Neurological signs due to brain compression, e.g. convulsions, apnoea, a dilated pupil or a depressed level of consciousness.*
- (iii) A full fontanelle and splayed sutures due to raised intracranial pressure.*

The infant may die of blood loss or brain compression. Management consists of replacing the blood lost and transferring the infant urgently to the nearest level 2 or 3 hospital where the subdural haemorrhage may needed to be drained.

28-9 WHAT IS A FACIAL PALSY?

Facial palsy is muscle weakness of one side of the face due to trauma to the facial nerve. This is almost always caused by pressure from a forceps blade on the facial nerve just in front of the ear.

The affected side of the face droops and the infant is unable to close the eye tightly on that side. When crying the mouth is pulled across to the normal side. Fortunately the weakness usually recovers spontaneously in a few days or weeks and no treatment is needed.

FACIAL PALSIES USUALLY RECOVER SPONTANEOUSLY WITHIN DAYS OF DELIVERY

**** The asymmetric crying face syndrome mimics a facial palsy but the infant is able to close the eye on the weak side. Usually the weakness of the face is only seen when the infant cries and the mouth is pulled to the normal side. The weakness is due to congenital absence of the muscles on one side of the face and does not improve with time.*

28-10 WHAT IS A BRACHIAL PALSY?

Brachial palsy (or Erb's palsy) is usually caused by excessive traction on the head and neck during a difficult vertex delivery. The infant is usually large and born at term with difficulty in delivering the shoulders. Brachial palsy may also complicate a poorly managed breech delivery. By stretching the neck, the brachial plexus of nerves is stretched and damaged.

Immediately after birth it is noticed that the infant does not move one arm due to weakness at the shoulder and elbow. The arm is fully extended, rotated inwards and held beside the body (the porter's tip position). Movement of the hand and fingers is normal, however. The infant also has a markedly asymmetrical Moro reflex. Unless there is an associated fracture, there is no tenderness, pain or swelling of the arm.

A BRACHIAL PALSY MAY RESULT IN PERMANENT WEAKNESS OF THE ARM**28-11 WHAT IS THE TREATMENT OF BRACHIAL PALSY?**

Usually the weakness is much better by a week and full movement and power return. If the nerves in the neck have been torn, however, the infant will still not be able to flex the elbow after a week and some weakness will remain permanently. There is little hope of spontaneous recovery if the arm is not better by 6 weeks.

Splints and keeping the arm above the head will not help recovery. Every time the nappy is changed however, the arm should be put through a full range of movements to prevent the development of contractures. If weakness remains by 6 weeks, the infant must be referred to a level 3 hospital for investigation and possible surgery to repair the torn nerves.

28-12 WHAT CAUSES BRUISING?

Bruising is common after difficult deliveries, especially breech delivery in a preterm infant. The bruise is due to bleeding into the skin and muscle caused by the rupture of small blood vessels. A tight umbilical cord around the neck commonly causes severe congestion and bruising of the face.

The bruise usually does not cause problems although the area may be tender for a few days. The bruise fades after a week or two and needs no treatment. The reabsorbed blood is converted into bilirubin and may cause jaundice, requiring phototherapy.

Bruising appearing after the first day is serious and suggests a bleeding problem or intentional (non accidental) trauma (battering).

28-13 WHAT FRACTURES ARE SEEN IN THE NEWBORN INFANT?

The clavicle is the bone most commonly fractured at birth. Fractures of the humerus, femur and skull are fortunately uncommon.

Fractures are usually caused by very difficult and traumatic deliveries. The fracture may be heard during delivery and bony crepitus (a grating feeling) may be felt after birth when the bone is palpated.

If the humerus or femur is fractured, the limb is usually swollen, tender and bruised. If the clavicle or humerus are broken, the infant will not move that arm, and will cry if the arm is moved. An asymmetric Moro reflex may mimic a brachial palsy. Fracture of a femur may cause shock due to blood loss. The clinical diagnosis of a fracture can be confirmed by X-ray.

Rarely the skull can be indented in a depressed fracture after a difficult delivery.

28-14 HOW ARE FRACTURES TREATED?

Fracture of the clavicle needs no treatment and heals well.

With fracture of the humerus, the arm should be immobilized to lessen the pain by strapping it to the side of the chest.

A fractured femur is treated with gallows traction after the infant has been resuscitated. Paracetamol (Panado syrup 2,5 ml) should be given for pain relief in all fractures.

If a depressed fracture of the skull does not correct spontaneously in 24 hours, or if the infant develops neurological signs, it must be referred urgently for the skull to be surgically elevated.

28-15 WHAT IS THE MANAGEMENT OF LACERATIONS?

Lacerations are usually made during a caesarean section, when the infant is cut by mistake as the uterus is opened. The infant may also bleed after a fetal scalp blood sample has been taken. Small cuts can be held closed with strapping. Large cuts must be sutured as soon as possible after delivery.

BLEEDING**28-16 WHAT MAKES A WOUND STOP BLEEDING?**

Normally bleeding from a wound stops spontaneously because:

1. ARTERIES GO INTO SPASM. This is particularly important when bleeding is from the umbilical cord or severe lacerations.
2. The blood contains PLATELETS which pack together and block the hole in the blood vessel.
3. The blood contains CLOTTING FACTORS which are proteins that cause the blood to clot. Many of these proteins are produced in the liver and most require vitamin K for their production. Each clotting factor acts on another in a chain reaction to produce the clot. If one or more is missing then the blood will not clot.

28-17 WHAT CAUSES EXCESSIVE BLEEDING?

There are 4 main causes of excessive bleeding in a newborn infant:

1. Damage to blood vessels.
2. Too few platelets.
3. Abnormal function of platelets.
4. Decreased amount of clotting factors.

28-18 WHEN DOES DAMAGE TO THE BLOOD VESSELS CAUSE BLEEDING?

Damage to capillaries causes bruising or purpura (small pin-point pink or blue bruises) especially in preterm infants that have very delicate vessels in the skin. The bruising is usually due to rough handling at delivery.

The commonest site of haemorrhage from a large vessel is the umbilical cord. If the cord clamp or ligature slips after the cord is cut, a serious or fatal haemorrhage may result. Haemorrhage from the umbilical vein can also occur if an intravenous catheter is displaced. If the cord snaps at delivery haemorrhage occur from both the umbilical vein and arteries. Bleeding from a large blood vessel can be stopped by clamping or tying off the vessel. A transfusion of whole blood is needed if the infant is shocked. After a big haemorrhage the packed cell volume and haemoglobin concentration may be normal for the first hour, before starting to fall. Therefore, a normal haemoglobin concentration or packed cell volume immediately after a big bleed does not exclude severe blood loss.

28-19 WHEN DOES A DECREASED NUMBER OF PLATELETS CAUSE BLEEDING?

The number of platelets in the blood is normally more than $100\ 000$ per mm^3 ($100 \times 10^9/\text{l}$) in both preterm and term infants. A platelet concentration of less than $100\ 000$ per mm^3 is abnormal and is called THROMBOCYTOPAENIA (thrombocyte = platelet; paenia = deficiency in the blood).

THROMBOCYTOPAENIA IS AN ABNORMALLY LOW NUMBER OF PLATELETS IN THE BLOOD

A decreased number of platelets may be caused by:

1. A DECREASED PRODUCTION of platelets by the bone marrow as a result of:
 - (i) Septicaemia.
 - (ii) Syphilis.
2. An INCREASED DESTRUCTION of platelets in the blood stream as a result of:
 - (i) Disseminated intravascular coagulation (DIC), when problems such as hypoxia, hypothermia or infection cause excessive clotting within the blood stream. This results in the using up (consumption) of large numbers of platelets and large amounts of clotting factors.
 - (ii) Antibodies against platelets crossing the placenta from the mother to the fetus (immune thrombocytopaenia).

*** *The mother producing antibodies to the fetal platelets but not to her own platelets (alloimmune thrombocytopenia).*

INFECTION MAY CAUSE BOTH A DECREASED PRODUCTION AND AN INCREASED DESTRUCTION OF PLATELETS RESULTING IN THROMBOCYTOPAENIA**28-20 WHEN DOES ABNORMAL PLATELET FUNCTION CAUSE BLEEDING?**

The concentration of platelets may be normal but their function may be abnormal. The commonest cause of decreased platelet function is the maternal ingestion of large amounts of aspirin during pregnancy. Aspirin crosses the placenta and may interfere with the normal function of the fetal platelets. Therefore, aspirin should not be taken in large amounts during pregnancy.

*** *Rarely, an inherited abnormality of platelets can cause abnormal platelet function.*

28-21 HOW DOES A DECREASED PLATELET NUMBER OR ABNORMAL PLATELET FUNCTION PRESENT CLINICALLY?

Both too few platelets and an abnormality of platelet function present with GENERALIZED PURPURA (also called petechiae). This is a rash of small pink or blue spots over the whole body, but especially areas where the infant is handled, such as the arms and legs. Localized purpura (purpura of one part of the body only) is usually due to trauma (e.g. cord around the neck).

Bleeding due to a decreased number of platelets is managed by removing the cause, if possible, and transfusing packs of platelet, if indicated.

GENERALIZED PURPURA SUGGESTS TOO FEW PLATELETS OR ABNORMAL PLATELET FUNCTION

28-22 WHEN DOES A DECREASE IN CLOTTING FACTORS CAUSE BLEEDING?

There are many separate clotting factors (numbered 1 to 13) which are needed for the normal clotting of blood. If one or more is missing, blood will not clot normally. Clotting factors are decreased in:

1. Haemorrhagic disease of the newborn.
2. Inherited deficiencies of a single clotting factor, e.g. haemophilia.
3. Preterm infants.
4. Disseminated intravascular coagulopathy (DIC).
5. Liver disease.
6. Maternal WARFARIN treatment. If this anticoagulant drug is given to the mother during pregnancy it will cross the placenta and may cause severe bleeding in the infant at delivery. HEPARIN does not cross the placenta.

Except for disseminated intravascular coagulopathy (DIC), all these conditions result in a decreased production of clotting factors by the liver. In disseminated intravascular coagulopathy (DIC) clotting factors are used up (consumed) too fast.

Bleeding due to decreased clotting factors is managed by removing the cause, if possible, and replacing the missing factor with fresh frozen plasma and/or factor 8 concentrate.

28-23 WHAT IS HAEMORRHAGIC DISEASE OF THE NEWBORN?

Vitamin K is needed by the liver to produce most of the clotting factors. In adults, bacteria in the gut produce vitamin K while vitamin K is also available in a balanced adult diet.

The fetus receives very little vitamin K from the mother during pregnancy and there is not much vitamin K in breast milk. At birth the infant, therefore, has very limited stores of vitamin K for the production of clotting factors. If added vitamin K is not given at birth, the levels of some clotting factors start to fall and usually reach their lowest levels by day 4. Thereafter they slowly return to normal as bacteria colonise the gut and start to produce vitamin K. The fall in clotting factors is most marked and the recovery slowest in preterm infants as they have an immature liver.

Between days 4 and 7 after delivery, when the concentration of some clotting factors are low, the baby may present with bleeding. This is called haemorrhagic disease of the newborn.

HAEMORRHAGIC DISEASE IS CAUSED BY LOW CONCENTRATIONS OF SOME CLOTTING FACTORS DURING THE FIRST WEEK OF LIFE

28-24 HOW DO YOU PREVENT HAEMORRHAGIC DISEASE OF THE NEWBORN?

ALL newborn infants must be given 1 mg vitamin K1 (0,5ml Konakion) after birth by intramuscular injection. This is best given into the lateral thigh (NOT into the buttock) when the infant reaches the nursery or ward. It is preferable not to give the vitamin K in the labour ward or theatre as the infant may in error be given ergometrine prescribed for the mother. Giving oral Konakion is not recommended as it has to be repeated once or more, especially in breast fed infants, to be effective.

ALL BABIES MUST BE GIVEN INTRAMUSCULAR KONAKION AFTER DELIVERY

*** *Giving Konakion will not cause or aggravate neonatal jaundice. Ergometrine, given in error to the infant, causes severe apnoea lasting a few days.*

28-25 WHAT IS THE CLINICAL PRESENTATION OF HAEMORRHAGIC DISEASE OF THE NEWBORN?

Infants with haemorrhagic disease present with bleeding in the first week of life. At the start of the bleeding they appear generally well but later they may become pale and shocked due to blood loss. They will not have received vitamin K1 at delivery. Bleeding usually starts in the gut and presents as haematemesis (vomiting blood) or melaena (blood in the stools). Infants may also develop generalized bruising or bleed from the umbilical cord. They may also bleed from a heel prick, needle punctures or circumcision wound. If the delivery was traumatic, they may develop a subaponeurotic haemorrhage. Rarely they may bleed into the brain. Unless treated, they may die of blood loss.

HAEMORRHAGIC DISEASE USUALLY PRESENTS WITH VOMITING BLOOD OR BLOOD IN THE STOOL

A decrease in clotting factors due to causes other than haemorrhagic disease also presents with GENERALIZED BRUISING, BLEEDING INTO INTERNAL ORGANS and bleeding from lacerations, needle prick sites or operation sites.

BLEEDING FROM MANY SITES IS USUALLY CAUSED BY A DECREASED CONCENTRATION OF ONE OR MORE CLOTTING FACTORS**28-26 HOW SHOULD YOU TREAT HAEMORRHAGIC DISEASE OF THE NEWBORN?**

1. Give the infant 1 mg vitamin K1 (Konakion) intravenously. An intramuscular injection may cause a haematoma.
2. Start an intravenous infusion with Neonatalyte.
3. Treat shock with fresh frozen plasma, stabilized human serum, Haemaccel, normal saline or Plasmalyte B. Fresh frozen plasma is preferable as it will also replace some of the missing clotting factors.
4. Cross match fresh blood and transfuse if necessary.
5. Monitor the haemoglobin concentration or packed cell volume.
6. Watch for further bleeding or signs of shock.

*** *Konakion will correct the deficit of clotting factors in haemorrhagic disease within a few hours. Fresh frozen plasma will replace factors 2, 7, 9, 10 (vitamin K-dependent factors) which are very low in haemorrhagic disease.*

28-27 HOW DO YOU DIFFERENTIATE BETWEEN MATERNAL AND INFANT BLOOD?

Vomited blood or blood in the stool may be either:

1. Maternal blood, swallowed at delivery or from a bleeding nipple.
2. Infant blood from a bleed in the mouth, upper airways or gastrointestinal tract.

It is essential to differentiate between maternal and infant blood as swallowed maternal blood causes few problems while bleeding by the infant requires urgent management.

Fresh (red) blood can be identified as maternal or infant blood using the Apt (sodium hydroxide) test:

1. Add the sample of blood (vomit or stool) to some water in a test tube and shake well to give a pink solution. If the solution is brown and not pink the Apt cannot be done. To do an Apt test the blood must be red and the solution pink.
2. If the pink solution is not clear, centrifuge the sample and then transfer the clear solution to another test tube.
3. Add 5 ml of the pink solution to 1 ml of 1% sodium hydroxide in a second test tube and shake well.
4. Examine the colour of the mixture at 1 minute. If the mixture stays pink then the blood is from the infant. However, if the mixture turns brown the blood is maternal. If the test is read after 1 minute an incorrect result may be obtained as infant blood will eventually also turn brown.

28-28 WHAT IS HAEMOPHILIA?

Occasionally infants bleed because they are missing a single clotting factor. This is an inherited abnormality and the commonest example is haemophilia, caused by the lack of clotting factor 8. Haemophilia is seen almost always in boys and may present as excessive bleeding after circumcision. A family history of bleeding in boys may be obtained. Girls are usually not affected by haemophilia but may pass the clotting abnormality on to their sons. It can not be corrected by giving vitamin K. All these infants must be referred urgently to a haematology unit in a level 2 or 3 hospital where they are treated with factor 8. Haemophilia cannot be cured and is a lifelong problem. However, individual bleeds can be controlled with factor 8 infusions.

**** Infants with haemophilia have an abnormal partial thromboplastin time (PTT) but a normal prothrombin time or international normalized ratio (INR). In contrast, both tests are abnormal in haemorrhagic disease of the newborn.*

28-29 HOW CAN YOU DIAGNOSE THE CAUSE OF THE BLEEDING?

1. Bleeding due to a severe laceration is obvious.
2. Localised bruising or purpura is usually due to trauma.
3. Infants with generalized purpura who are otherwise well usually have thrombocytopenia, or abnormal platelet function due to maternal aspirin ingestion.
4. Infants with generalized purpura, blood in the stools or vomitus, or excessive bleeding from the cord, lacerations, needle prick sites or operation wounds usually have a deficiency of one or more clotting factors.
5. Generally sick infants usually have a disseminated intravascular coagulopathy as the cause of bleeding.
6. Bleeding in infants who have not been given routine Konakion is probably due to haemorrhagic disease.
7. Male infants who are generally well but bleed excessively may have haemophilia.

All infants with bleeding problems must be referred urgently to a level 2 or 3 hospital for measurements of platelets and clotting factors.

CASE PROBLEMS

CASE 1

An infant is delivered by difficult vacuum extraction. A few hours after delivery the infant appears pale, has a heart rate of 180 beats per minute and is noticed to have a boggy swelling of the whole scalp. The packed cell volume and haemoglobin concentration are low.

1. What is the diagnosis?

The swelling of the whole scalp, the tachycardia and the anaemia indicate that the infant has had a subaponeurotic haemorrhage. This was probably caused by the vacuum extraction.

2. Why is this not a cephalhaematoma?

A cephalhaematoma is usually unilateral and never extends over the whole scalp. Neither is it large enough to cause anaemia and shock.

3. What is the correct treatment of a subaponeurotic haemorrhage?

A subaponeurotic haemorrhage is an emergency as the infant can easily die of blood loss. Blood must be cross matched urgently. While waiting for the blood, give fresh frozen plasma, stabilized human serum, Haemaccel or Plasmalyte B to treat the shock. Fresh frozen plasma and stabilized human serum also provide clotting factors. Also give 1 mg of Konakion to help the liver to replace the clotting factors lost in the haemorrhage.

CASE 2

An infant weighing 5 kg is born in a level 2 hospital. The shoulders are delivered with great difficulty. After birth it is noticed that the infant does not move her right arm much and has an asymmetrical Moro reflex. The infant is also very bruised.

1. What do you think is wrong with her arm?

She probably has a brachial palsy (Erb's palsy) caused by excessive downward traction on the neck during the difficult delivery of the shoulders.

2. How would you confirm this diagnosis?

The infant will have weakness of the shoulder and elbow and will be unable to lift her arm off the bed or flex the elbow against gravity. Movement and power in the hand will be normal. Unless there is a fracture, there should be no tenderness.

3. Will the weakness recover?

Usually the weakness is much improved by a week. If not, then full recovery may not take place.

4. What is the correct treatment?

No treatment is needed. However, the mother should flex the elbow and shoulder a few times a day to prevent contractures developing. If weakness remains at 6 weeks the infant must be referred to a level 3 hospital for further investigation.

5. Why do infants bruise easily?

Because the small blood vessels in the skin are easily damaged. Bruising is usually due to a difficult delivery. A tight cord around the neck may cause bruising of the face. Extensive bruising may result in jaundice.

CASE 3

A term infant is noticed to have extensive purpura over the trunk and limbs soon after a normal vaginal delivery. The infant is clinically well and breastfeeds.

1. What is purpura?

Purpura (or petechiae) are small pink or blue spots (bruises) caused by bleeding into the skin.

2. What are the causes of generalized purpura?

Either too few platelets or an abnormality of the platelets.

3. What is thrombocytopenia?

Too few platelets, i.e. less than 100 000 per mm³ (100 x10⁹/l).

4. What are the common causes of thrombocytopenia in a newborn infant?

- (i) A decreased production of platelets, e.g. septicaemia or syphilis.
- (ii) An increased destruction of platelets, e.g. DIC or maternal antibodies against the infant's platelets.

5. What is a common cause of abnormal platelet function?

Aspirin which the mother has taken during the last few days of pregnancy.

CASE 4

A preterm infant weighing 1500 g is born at home. The infant is transferred to hospital but the staff forget to give Konakion. On day 5 the infant passes a lot of fresh blood in the stool, has a small dark brown vomit and appears pale.

1. What is Konakion?

Vitamin K1. This must be given to all infants at birth by intramuscular injection into the thigh. Oral vitamin K should not be used as it has to be given repeatedly, especially in breast fed infants.

2. Why does this infant have blood in the vomitus and stool?

The infant probably has haemorrhagic disease of the newborn due to lack of vitamin K. This is commoner in preterm than in term infants.

3. What is the correct management of this infant?

Start an intravenous infusion with Neonatalyte and cross match blood urgently. Give 1 mg Konakion intravenously. An intramuscular injection may cause a large haematoma. Give fresh frozen plasma followed by blood if the infant is shocked.

4. Is haemorrhagic disease of the newborn preventable?

Yes. This condition should not be seen if Konakion is given routinely to all infants.

5. What diagnosis must always be thought of if bleeding presents in a male infant who is otherwise well?

Haemophilia.

6. What is a common cause of bleeding in a severely ill infant?

Disseminated intravascular coagulopathy (DIC) due to septicaemia or hypoxia.