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Thrombo-Embolism in Pregnancy

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IT IS GENERALLY believed and taught that venous thrombosis and thrombo-embolism is uncommon among Asians (Hwang 1968, Tinckler 1964, Srivastava 1964). Few cases of puerperal thrombo-embolism have been described among Asians.

We present the clinical histories of 4 cases of puerperal thrombo-embolism as seen in the Obstetric Unit of the University Hospital, Kuala Lumpur.

Case Histories:

I. Patient, S.T. was a 36 year old Indian Gravida 3 Para 3 who had a normal delivery at term after oxytocic induction of labour in September 1973. She had a mild toxaemia of pregnancy and was not anaemic. On the 3rd post-partum day, she had a tubal ligation done under lumbar epidural block (using 0.05% lignocaine with adrenaline). She had stilboesterol for suppression of breast milk. There was no past history of significance.

At about 0300 hours on the 4th post-partum day, she had a fainting spell while walking towards the nurses' station to request for a vulval pad. She recovered but became apnoeic and pulseless soon afterwards. Cardiac massage and artificial ventilation were performed but in spite of further resuscitation measures, she was pronounced dead at 0750 hours. Her clinical presentation and electrocardiographic changes suggested the probable cause of death as acute massive pulmonary embolism.

No post-mortem was performed.

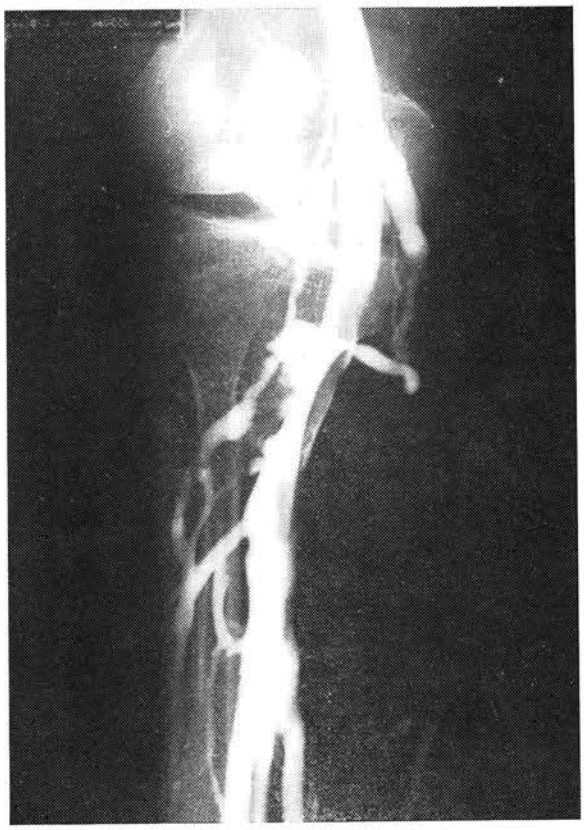
II. Patient, K.C.H., was a 29 year old Chinese primigravida who booked with us at 37 weeks of gestation. She was found to be well except for marked varicose veins on both legs. There was no past history of significance. Her father and elder sister had had marked varicose veins. Her younger brother had been admitted and treated for deep vein thrombosis in the University Hospital. She had a normal delivery of a baby of 3220 gm. on 4.12.1974 after a labour of 16 hours.

Her post-partum period was uneventful until the 4th day when she was observed to have pitting oedema of the left leg. The circumference of the leg at mid-calf was greater than that of the right by 2 cm. There was no tenderness of the calf muscles and Homan's sign was negative. She had slight discomfort in the left groin.

A thrombosed superficial vein was palpable on the medial aspect of the right leg. (See photograph) There was some redness, increased warmth and tenderness on palpation. A diagnosis of deep vein thrombosis of the left leg and superficial thrombophleblitis of the right leg was made. A venogram showed filling defects in the left ilio-femoral veins extending almost up to the common iliac vein.

An emergency thrombectomy was performed. Post-operatively, the patient was put on intravenous heparin and sodium warfarin. She made an uneventful recovery and was discharged 25 days later with maintenance dose of warfarin daily. Extensive haematological studies were performed but did not show evidence of hypercoagulation defect.

III. S. bte D., a 26 year old Malay rubber tapper, was booked early at 11 weeks of gestation. She



Venogram showing filling defect in Politeal Vein (R) Leg of Patient K.C.H.

had a bad obstetric history with only one full term delivery followed by 4 abortions at 3 to 6 months gestation. No cause could be found for her habitual abortion. There was no other past history of significance. She was started on 17 α-hydroxy progesterone caproate 250 mgm. by intramuscular injections twice a week. She progressed well in her pregnancy until the 30.12.1975, when at 14 weeks of gestation, she was admitted with fever and right calf pain and swelling of 5 days duration. She was found to have a swollen right calf with oedema. Homan's sign was negative. The right calf felt warmer than the left. A provisional diagnosis of deep vein thrombosis was made. An emergency venogram showed deep vein thrombosis of the right calf, irregularity of the deep veins of the left calf suggestive of previous deep vein thrombosis followed by re-canalization. The deep veins of both thighs were not affected. She was immediately started on intravenous heparin and sodium warfarin. Prothrombin time was maintained at 30 percent of normal. She was kept in the ward for a month. Three days after discharge she started to abort. This was completed with evacuation of the uterus with minimal bleeding. Pathological report did not indicate an accidental haemorrhage.

IV. A d/o F., a 23 year old Indian Gravida 2 Para 1 was admitted on 5.5.1975 at 37 weeks of gestation for severe pre-eclamptic toxaemia. She was heavily sedated and induced. Labour lasted 16 hours and she delivered a baby of 2270 gm.

On her first post-partum day she was found to have a low haemoglobin of 7 grams/100 ml. She had total dose infusion of Imferon (R). On the fourth post-partum day, she was found to be febrile with tenderness of the right calf. The right calf was swollen, slightly warm with positive Homan's sign. There was no abnormality of the thigh. She was clinically suspected to have deep vein thrombosis and a venogram confirmed the diagnosis. The femoral and iliac veins were not involved.

She was heparinised. Her prothombin time was kept well controlled. However, on the tenth day, she developed deep vein thrombosis of the left calf. Symptoms and signs referral to both legs subsided after a week of continual anti-coagulant therapy. She was discharged after a month stay in hospital.

Discussion:

It is well recognised that pregnancy and puerperium predispose to venous thrombosis and embolism. Several factors are involved. Infection especially at the time of delivery can spread to the lateral pelvic walls leading to thrombosis of pelvic vessels. Stasis of blood occurs because of poor venous return from the foot and calf muscles. This effect becomes more apparent if patients need prolonged bedrest in the antenatal period and in puerperium because of some complications, for example, toxaemia of pregnancy.

An important factor is the changes seen in the constituents of the blood. The plasma concentration of fibrinogen has been shown to be increased during pregnancy from about 250 mgm/100 ml. in the non-pregnant state to 400 – 500 mgm/100 ml. at term. The concentrations of Factors VII, VIII, IX and X are all raised considerably above non-pregnant levels. Changes in the platelets are uncertain but the balance of evidence suggests that platelet count is somewhat lower in pregnancy but seem to be increased after delivery. Shaper et al (1968) found no change in platelet adhesiveness.

It is generally believed that there is some decrease in fibrinolytic activity in pregnancy and puerperium. There seems to be a decrease in

Table I

Clinical Features of Patients

Patients	Race	Age	Parity	Family History	Delivery	Hormones
1. S.T.	Indian	36	3		Normal	Stilboesterol in puerperium
2. K.C.H.	Chinese	29	1	Brother has D.V.T.	Normal	—
3. S. bte D.	Malay	26	6		Antenatal	"Prolution" for threatened abortion
4 A d/o P.	Indian	23	2		Normal	Stilboesterol in puerperium

level of available circulating plasminogen activator in the latter part of a normal pregnancy. Also, the levels of two protease inhibitors, namely α_1 anti-trypsin and α_2 macro-globulin are considerably raised in pregnancy plasma. There seems to be only minimal increase in plasma plasminogen in late pregnancy. All these changes in blood constituents suggest a "hypercoagulation" state in pregnancy. But the likely effects are difficult to predict though it must contribute in some degree to the higher incidences of venous thrombosis and thrombo-embolism in pregnancy.

A factor of some importance is the administration of oestrogens for suppression of lactation in puerperium. Daniel et al (1967) noted that the incidence of puerperal venous thrombosis was increased 10 fold in mothers of more than 25 years whose lactation were suppressed with oestrogens. Daniel (1968) later showed that the level of factor IX in the blood is raised following administration of high doses of oestrogen.

Deep vein thrombosis is not common during pregnancy, though it is commoner in puerperium. The incidences of antepartum deep vein thrombosis and puerperal venous thrombosis have been quoted as 0.086 percent and 0.27 percent respectively of all deliveries in the United States (Husni 1967). Deep vein thrombosis can lead to pulmonary embolism which has recently become the second most common cause of maternal mortality in England and Wales (Report of Confidential Inquiry Maternal Mortality). There were 352 maternal deaths due to pulmonary embolism in England and Wales over a period from 1958 to 1966. 263 of such deaths occurred in the post-partum period (1 death per 28,000 deliveries) and 89 deaths occurred in the ante-partum period.

Venous thrombosis and pulmonary embolism are uncommon in Malaysia. Hwang (1968) found only 29 cases of pulmonary embolism in over 36,000 consecutive necropsies in Singapore from 1952 – 1966. The incidence seems greater among females and Indians. Of these 29 cases, only one could be attributable to puerperal thrombo-embolism. He also noted that over a five years period (1962-1966), there were 52,861 major operations in the Singapore General Hospital. Among these patients there were only 5 cases of pulmonary embolism giving a very low incidence of 0.094 per 1000 operations. The comparable incidence is 0.14 per 100 operations in the United States (De Bakey 1964).

Using more sensitive methods, Cunningham and Yong (1974) showed that post-operative deep vein thrombosis in Malaysia is not oncommon as was once thought. They used the 125 I-labelled fibrinogen uptake test in 68 post-operative patients. They found unequivocal evidence of deep vein thrombosis of the leg in 8 patients in the first post-operative week producing an incidence of 12 percent. This incidence is still much less than similar series in the Western World when incidences varied from 15 percent (Bonnar and Welsh 1972) to 33 percent (Kakkar et al 1970).

The four patients whose clinical histories have been presented were all seen over a period of 2 years. During the same period of time there were 8,000 deliveries, in the University Hospital giving an incidence of 1 in 2,000 deliveries. It is highly possible that this may be only a fraction of the true incidence of deep vein thrombosis in puerperal patients. This can probably best be assessed if a study using 125 I-labelled fibrinogen can be made on normal puerperal patients.

Clinical diagnosis at best can only detect the late and obvious case. But clinical signs should not be disregarded. Pain over the legs is a very useful symptom. Tenderness, swelling and increased warmth over the affected lower limb are the best clinical signs (Hall and Clark 1971); these signs were apparent in all the 3 patients with deep vein thrombosis (See Table II). In the absence of better diagnostic techniques, clinical signs continue to be important. If the condition is continually kept in mind and clinical signs sought for diligently, earlier diagnosis is possible.

Summary:

Clinical histories of four cases of thromboembolism are presented. A brief discussion of pathogenesis and incidence in Malaysia is made. It is hoped that clinical signs suggestive of deep vein thrombosis should not be dismissed too lightly.

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Table II

Clinical Features of Patients

Patients	Onset of Symptoms	Pain	Fever	Swelling of Limb	Warmth of Limb	Homan's Sign	Local Tenderness	Site of Thrombosis	Investigations	
									Hb. gm. %	Blood Group
1. S.T.	4th day Puerperium	–	–	–	–	–	–	Not Known	12	A
2. K.C.H.	4th day Puerperium	+	–	+	+	–	+	Left Ilio-femoral	11	A
3. S. bte D.	Antenatal	+	+	+	+	–	±	Deep Veins Right Calf	11.2	AB
4. A. d/o P.	4th day Puerperium	+	+	+	+	+	+	Deep Veins Both Calves	7	O