ISCHAEMIC VENOUS THROMBOSIS IN PREGNANCY

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SUMMARY

Ischaemic venous thrombosis in pregnancy is uncommon. Thirteen cases could be diagnosed in eleven years. Venous gangrene stage of ischaemic venous thrombosis in pregnancy has disasterous consequence, including high mortality and morbidity.

Introduction

Acute deep vein thrombosis, recurrent deep vein thrombosis, post phlebitic syndrome, varicose veins, superficial thrombophlebitis are frequently noticed during pregnancy. The incidence varies from 0.5 per cent to 1.4 per cent cases of pregnancy (Flessa *et al*, 1974). Ischaemic venous thrombosis is not common during pregnancy. Clinical picture of ischaemic venous thrombosis goes through three stages, phlegmasia alba dolens, phlegmasia cerulea dolens and venous gangrene (Haimovici, 1971). A state of hypercoagulability exists during pregnancy due to rise in the levels of coagulation factors II, VII, VIII and X, increase in the number and adhesiveness of the circulating platelets, significant depression of the fibrinolytic system and slow blood flow due to increased intraabdominal pressure. Recent study disseminated intravascular coagulation (DIC) and congenital deficiencies of antithrombin III, protein C, or protein S, provides insights into the venous thrombotic process (Thomas, 1985).

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Methods

All patients admitted in the Obstetrics service having the suspicion of deep vein thrombosis of either extrimities in the peripartum period underwent careful history, physical examination, noninvasive Doppler (using 2MZ or 5MZ) study and complete blood count along with platelet count and haemoglobin examination. A diagnosis of deep thrombosis was accepted clinically by the presence of pain, oedema, raised skin temperature, tenderness, distended pretibial veins with patients supine (Pratt sign), calf or popliteal tenderness on acutely augmented hyperextension of foot (Homan's sign), more marked tenderness on anteroposterior compression than lateral calf compression (Moses sign), difference in maximum calf circumference greater than 1.2 centimeters, tenderness on compression of calf or thigh by pressure cuff inflated rapidly to 180 mm Hg pressure (Lowenberg sign), calf tenderness induced by inflating a thigh cuff to 45 mmHg pressure for 5 minutes (Ramirez sign), spasm of calf muscles observed by simultaneous elevation of lower extrimity and extension of feet (Peabody sign), delayed cooling (Provan sign), and palpable thrombi in varying combination.

Phlegmasia cerulae dolens was diagnosed by the presence of pain, cyanosis, massive odema, circulatory collapse, coolness of the distal part and presence of feeble arterial pulse in the background of deep vein thrombosis. When necrosis alongwith superficial or deep gagrene complicates venous thrombosis; venous gangrene can be diagnosed. By using a hand held doppler flow velocity detector over the posterior tibial, popliteal, superficial and common femoral veins, the major lower extrimity deep veins are examined. During examination presence or absence of phasic flow during distal limb compression, absence or presence of pulsatile flow, and competence of the venous valve during valsalva maneuver or proximal limb compression was elecited.

The patients were closely observed along with the scheduled therapy for venous stasis, pulmonary embolism, circulatory collapse or shock, the development of angiospasm, the presence of gangrene, underlying disease along with morbidity and mortality. Signs of improvement were reflected by rapid subsidence of pain, gradual disappearance of the cyanosis, improvement of the skin temperature, progressive stabilization of the blood pressure and diminution of the swelling of the limbs and distention of the veins.

Observation with Results

Ischaemic venous thrombosis was detected in 13 cases. Four patients were suffered from phlegmasia cerulea dolens, and venous gangrene was noted in 9 cases. All cases of phlegmasia cerulea dolens were localized in the lower extrimity, of which 3 on the left and 1 on the right. The distribution cases of venous gangrene were 6 in the lower, 2 in the upper, and one in both. Of these 5 cases were found in the left lower and only 1 on right lower extrimity. Two cases of Phlegmasia cerulea dolens and 7 cases of venous gangrene suffered from circulatory collapse or shock.

Out of 13 cases, 11 were multigravida and 2 were primigravida. Only 5 cases had previous history of deep vein thrombosis and in 2 cases ischaemic venous thrombosis started following attempted abortion in 1 case, and, thrombosis occurred following post partum haemorrhage in the other.

Doppler flow velocity analysis depicted a combined result. Anticipated findings in cases of pregnancy were biphasic flow (flow varies with respiratory cycle), pulsatility (suggesting elevated inferior vena caval pressure due to gravid uterus), mild augmentation of venous flow in response to distal limb compression. Our study revealed absent signal in 5 cases, continuous signal in 6, absence of augmentation in 9 and pulsatility in 11 cases and incompetency of venous valves in the different levels in 3 cases only, simultaneous arterial doppler flow study revealed an absence of flow in the diastole and a small continuous forward flow in 4 cases of venous gangrene.

Blood examination revealed leucocytosis in 11 cases, low haemoglobin level (6-11.6 gm/dL) in all cases and thrombocytopenia in 8 cases. In two cases red cell fragmentation were detected on general blood picture. Haemolytic serum was noticed in 3 cases.

On diagnosis of ischaemic venous thrombosis the patient was rapidly assessed and resuscitation with intravenous fluid and blood prioritized. With the stabilization of the patient anticoagulant therapy with heparin and microcirculatory stagnation clearence with low molecular weight dextran was started,

flow head of the venous system increased with xanthitol nicotinate, vitamin C, and elevation of the limbs. The integration and titration of the treatment was continued until control or amelioration of the disease process. In cases of deterioration with further morbidity, analysis of the factor variable performed in order to lead the clinical decisions. Antibiotics were used routinely.

Morbidity during the course of the disease was very frequent. Pulmonary embolism was diagnosed in 4 cases of venous gangrene and 1 case of phlegmasia cerulea dolens. Similarly disseminated intravascular coagulation was noted in 3 and 1 case respectively. Stress gastrointestinal haemorrhage and renal failure deloveped in the 3 and two cases of venous gangrene.

Three deaths occurred in case of venous gangrene only. All 3 had their multiorgan failures along with shock. In 1 case massive pulmonary embolism following amputation of the leg alongwith terminal disseminated intravascular coagulation was suspected but in the same case the new born baby survived.

In venous gangrene autoamputation of the tips of the fingers in 1 and left toes occurred in 1 and in 2 cases. Conservative amputation of the left foot and below knee amputation were performed in 1 case each. Fasciotomy was performed under local anaesthesia in 3 cases of venous gangrene, and, one case of phlegmasia cerulea dolens.

Discussion and Comments

Several interesting observations from our study are: practically all cases of ischaemic venous thrombosis of pregnancy started from deep vein thrombosis, as the disease progresses morbidity of the patient increases, and in cases of venous gangrene both mortality (33%, 3/9) and morbidity is very high. The incidence of ischaemic venous thrombosis during pregnancy is low (13 cases only in eleven years). The incidence of ischaemic venous thrombosis varies from 1.7 per cent to 5.2 per cent. Villavicencio *et al* (1985) noticed this in 6 cases out of 546 in acute vascular disorders in the children, of these one case aged 14 years developed ischaemic venous gangrene in th postabortion stage. Largest series studied by Haimovici (1982) consisting of 175 cases of phlegmasia cerulea dolens and 158 cases of gangrene of varying etiology. Trauma, postoperative state, leukaemia, postseptic abortion, postpartam, malignancy, ulcerative colitis, pulmonary diseases and varicella infection are the etiological factors of ischaemic venous thrombosis. Hueter in 1859 provided all essentials of clinical picture. Differential diagnosis varies with the different stage of the disease. Venous gangrene complicating acute prolonged vascular collapse, mixed arterial and venous occlusion, acute infectious diabetic gangrene, embolic gangrene and skin necrosis with anticoagulant therapy has to be considered. It is important to differentiate between acute cases of disseminated intravascular coagulation (DIC) in which the thrombohaemorrhagie phenomenon and gangrene appear during the episode of bacterimia, and, in case of purpura fulminans where fever, bleeding, gangrene with skin haemorrhage, neurological and renal damage appear a few days after the original disease like Beta haemolytic streptococci, Salmonella, Staphylococcus aureus infection, viral infection or even snake bite.

Doppler flow velocity is a reliable, quick, easily performed bedside procedure with a high yield for diagnosis of deep

vein thrombosis specially above the level of calf muscle. Most of ischaemic venous thrombosis involve deep veins of the legs, femeropoliteal region and ileofemoral region leading to absent Doppler signal. However experience is necessary to achieve reliable result. Anemia, lucocytosis, thrombocytopenia, red cell fragmentation, haemolytic anaemia, decreased fibrinogen level is common with ischaemic venous thrombosis. Recent study suggests extrinsic pathway activation is more common specially those with spesis which is accompanied by extensive tissue necrosis (Moake and Levine, 1985).

Ischaemic venous thrombosis during pregnancy seems to be one most compliciation prone forms thrombophlebitis specially during venous gangrene phase. The incidence of pulmonary embolism is 25 per cent (one out of four) in cases of phlegmasia cerulea dolens and 45% (four out of 9) in cases of venous gangrene. The incidence quoted by Haimovici (1982) is 18.3 per cent and 41.1 per cent respectively. Disseminated intravascular coagulation and stress ulcer with gastrointestinal bleeding is noted in 33 per cent cases. Venous thromboembolism, a frequent complication in DIC is specially likely when activated partial thromboplastin time (APTT) is shortened which is usually associated with decreased levels of antithrombin III, heparin cofactor II, protein C, and protein S. Mortality varies from 16 per cent in phlegmasia cerulae dolens, 42 per cent in venous gangrene which is about 25 per cent in our series. It is likely the factors which dictates the mortality are multifactorial. These are systemic like shock, disseminated intravascular coagulation, multiple organ failures, the presence of venous gangrene as local factor, and, response to therapy and speed with which it is implemented.

Surgical intervention in this series is limited to amputation and fasciotomy. Autoamputation with the improvement of the general condition is noted about 25 per cent of the cases. Most of the cases-venous gangrene needed the local amputation of the toes but repeat amputation of the foot, and repeat amputation below knee, in one case. This patient had fatal outcome. To prevent myoedema fasciotomy is performed in indicated cases. This also prevented compartment syndrome. Thrombectomy or sympathectomy has not been attempted in our series.

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See Fig. on Art Paper I.