Chapter 12

HAEMOLYTIC URAEMIC SYNDROME

Gasser in 1955 applied this term to clinical syndrome characterized by acute haemolysis, acute renal failure and systemic hypertension. Microangiopathy, thrombocytopenia and circulating burr cells are usual. Hyperbilirubinaemia and intravascular coagulation are possible. Haematuria, proteinuria and casturia is present in child who is oliguric. Occurance is maximum in first 3 years of life and in countries with poor hygiene and tends to occur mainly in older children as conditions improve.

ETIOLOGY

Hypersensitivity to viral or bacterial infection enteral in site resulting in Schwartzman reaction to endotoxin is most likely mechanism.

Viruses include arbovirus, myxovirus, coxsackie virus, adenovirus and cytomegalovirus. Bacterias such as E. Coli, schigella, salmonella, streptococcus, anaerobic claustridia and rickettsia.

There is underlying abnormality of prostaglandin synthesis whereby there is lack of release of prostacyclin, natural inhibitor of intravascular platelet aggregation. Such defect could increase liability to platelet vascular interaction after viraemia or other infection. Such defect might be inherited.

Prostaglandins and prostacyclins have role in regulating intrarenal blood flow, antihypertensive activity and sodium excretion.

PATHOGENESIS

1. Viral infection with direct effect on renal endothelium.
2. Thrombotic microangiopathy.
3. Schwartzman phenomenon.
4. Antigen antibody complement reaction.

Viral infection damages endothelium and activate complement and kinin and thereby evoke coagulation.

Microangiopathic haemolytic anaemia may be associated with microthrombi formation.

Serial coagulation studies indicate consumption of factor 5 and fibrinogen with raised fibrin degeneration products indicating consumption coagulopathy.

HISTOPATHOLOGY

Renal manifestations are most dramatic. Microangiopathy is rule with capillary and arteriolar lesion dominating. In addition to fibrin thrombi there is thickening of walls of these vessels and flocculant deposits between endothelial walls and basement membrane. Platelet aggregations occur with thrombotic patches of various size resulting. Cellular proliferation is rare. Histology is variable from focal glomerulonephritis to cortical necrosis. Immunofluroscence shows fibrinogen in capillaries and walls of arterioles. Electron microscopy reveals widening of subendothelial area by fluffy deposits relating to thickening of capillary walls in glomeruli. Glomerular endothelial walls are swollen and mesangial cells may be hyperplastic. Smudged foot processes of epithelium, electron dense deposits and virus like particles have been described.

CLINICAL FEATURES

Commonest history is that of mild gastroenteritis which may have lasted from one day to two weeks. Occasionally respiratory infection precedes this disorder or chronic renal disease exists prior to acute exacerbation.

Abdominal pain, gastrointestinal and nasal bleeding is common. Sudden pallor, haematuria and acute renal shut down occurs.

Edema or purpura may also be presenting sign. Jaundice occasionally occurs.

Anaemia is usually severe and accompanied by neutrophil leucocytosis. Thrombocytopenia varies from slight to marked. Erythrocytes have characteristic contracted, distorted and fragmented appearance known as “burr cells”. There are fragmentocytes, helmet cells and microspherocytes. Reticulocytosis is present and may be accompanied by erythroblastaemia. Coomb and Heinz body tests are negative. Serum bilirubin elevated. Blood urea reaches 300 mg per dl or more very rapidly. Hypertension is always present.

Improvement in urine output, rise in platelet count and fall in FDP herald recovery.

DIFFERENTIAL DIAGNOSIS:

1. Thrombotic thrombocytopenic purpura: Characterized by haemolytic anaemia, neurological signs, purpura and pyrexia with 25% mortality.
2. Acute renal failure complication on chronic renal failure: Plasma C3 is normal.
3. Microangiopathic haemolytic anaemia: Anaemia found in association with thrombotic thrombocytopenic purpura, acute glomerulonephritis, haemolytic uraemic syndrome and renal cortical necrosis.

TREATMENT

1. Elimination of precipitating agents.

2. Treatment of severe haemolytic anaemia, renal insufficiency and systemic hypertension.
3. Treatment of primary condition includes specific antimicrobial therapy and symptomatic treatment of complications.

For correction of anaemia small packed red cells transfusion are given to maintain haemoglobin around 8-10 gm per 100 ml.

Use of fresh platelets obtained by plasmapheresis should be considered if thrombocytopenia is profound.

In mild uraemia fluid intake should be restricted to urinary output plus 200-500 ml daily with low sodium (less than 25 mmol daily). Dietary intake of protein should be restricted to 0.5-1 gm per kg per day with energy intake mainly as carbohydrates.

In severe uraemia intravenous 5% glucose infusion should be given.

Acute uraemia may require treatment with peritoneal or haemodialysis.

Intravenous heparin 25 units per kg per hour is employed to minimize intravascular thrombosis.

For treatment of hypertension low sodium diet and water restriction helps. Antihypertensives are given.

Prophylactic antibiotic is advised during acute stage and while patient is on dialysis.

Plasmapheresis and prostacyclin infusions have been used.

PROGNOSIS

Mortality is 10-30%. Children less than 2 years do better. Relapses may occur even after 1 year of good health. Long term dialysis is required in some children. ❑