MATERIALS

50 critically ill patients with clinical diagnosis of shock syndrome were selected for this study. They were suffering from cardiogenic shock (10 cases), septic shock (10 cases) and olegaemic shock (30 cases) due to haemorrhage (10 cases) and other causes of extreme fluid loss like burns (10 cases), diarrhoea and dysentery (10 cases).

Criteria for selection of shock cases

The diagnosis of shock syndrome was made if majority of the following features were present in these cases (fig1,2).

Cardiogenic shock

(1) Complaints of severe precordial pain, breathlessness, sweating and palpitation.
(2) Other features like restlessness, pallor/cyanosis, collapsed peripheral veins, cold extremity.
(3) Hypotension (systolic blood pressure below 90 mm of Hg).
(4) Tachycardia (pulse rate more than 120 per minute).
(5) Subnormal temperature (when the difference between core and peripheral i.e. rectal and great toe temperature was more than 3°C).
Septic shock

(1) History of infection of traumatic or operative wounds or any other acute infection.
(2) Complains like fever, chill, pain abdominal discomfort.
(3) Tachycardia (pulse rate more than 120 per minute).
(4) Mental confusion/Delirium.
(5) Urine volume less than 25 ml per hour.
(6) Hypotension (systolic blood pressure below 90 mm of Hg). But in two cases blood pressure was within normal limits.

Oligaemic shock

(1) Recent history of haemorrhage, diarrhoea, dysentery and burns.
(2) Complains like thirst, breathlessness, pain, sweating.
(3) Other features like restlessness, pallor/cyanosis, collapsed peripheral veins, cold extremity tachycardia (pulse rate more than 120 per minute).
(4) Hypotension (systolic blood pressure below 90 mm of Hg).
(5) Central venous pressure less than 5 cm of normal saline.
(6) Subnormal temperature i.e. when the difference between core (rectal) and peripheral (great toe) temperature is more than $30^\circ$C.

(7) Urine volume less than 25 ml per hour.

In these patients blood levels of lactic acid, pyruvic acid, pH, peripheral haematocrit values, plasma bicarbonate and serum electrolytes were estimated from samples collected from most peripheral veins. These samples of blood were made arterialised by placing a mop soaked in warm saline over the vein for a few minutes before collection of blood sample. Central haematocrit level was also estimated from another blood sample collected from a major vein. The central venous pressure and the difference between core (rectal) and peripheral (great toe skin) temperature were recorded in all cases. Urinary bladder was drained with a self retaining catheter and the later was left in situ for monitoring the rate of urine secretion.

Blood samples for these investigations were collected immediately when the patients were admitted with diagnosis of shock or when shock state developed in patients admitted earlier for some other diseases. Thereafter, estimation and recording of all these parameters were repeated every hourly (except septic shock) till the recovery of shock.
Fig. No. 3
Patient recovered from shock.

Fig. No. 4-A
Sekunder Electronic Thermometer, Skin lead in use.
state or death of the patients occurred. For first three hours the same periodicity was maintained in cases of septic shock also. But thereafter in these group of cases recording of all these parameters were carried out every 2-3 hours and the operation were continued till their recovery from the shock/death occurred.

Recovery from the shock was ensured by the following features (fig1&3 ) :-

(1) Clinical recovery i.e. improvement of breathlessness, thirst, pallor/cyanosis, urine secretion more than 30 ml per hour and subsidence of tachycardia (pulse rate 90 per minute or less).

(2) Improvement of hypotension (systolic blood pressure coming to 100 mm of Hg or more.

(3) Warm extremitis (rectal and great toe temperature gradient become less than 3°C.

For "control" study, ten healthy subjects with normal haemodynamics (comprising of 5 males and 5 females) were selected. The haemodynamic was ensured normal if the subject had the followings criteria :-

(1) He had sense of well being and carrying out his day to day work without much difficulty.
(2) He was not having anaemia clinically.

(3) He had taken meals at least 3 hours before, rested on a bed for at least 15 minutes and was apparently in mental rest.

These subjects were volunteers from the patients who came for minor surgical operations (hernia, hydrocele, removal of small tumours etc) and gynaecological operations (dilatation and curatage, dilatation and electrocautery etc).