Renal Replacement Therapy (RRT)

Figure 1. A patient undergoing RRT

What is this procedure?

RRT is a therapy that replaces the normal blood-filtering function of the kidneys. The patient's blood is drawn and pumped through a haemofilter which is used to remove body wastes and excessive fluid. Afterwards, the blood is returned to the patient.

Why is there a need to do it?

RRT is needed when the kidneys fail to function adequately to remove enough wastes and fluid from the body which may be life-threatening. Kidney failure can develop if there is kidney problem itself, or it can also develop because of another illness, most commonly severe infection.

How is it done?

A haemo-cathether is inserted into a large vein on one side of the neck or groin areas. Blood is let out of the body through the catheter to the dialysis machine and then return to the patient. The above process can be done for several hours (intermittent haemodialysis), or continuously for days (continuous haemofiltraton or haemodiafiltration). The RRT choice depends on the patient's condition.

When to stop?

RRT can be stopped when kidney function improved. When RRT is no longer required, the haemo-catheter can be removed. However, the kidney damage may be permanent. Whether a patient eventually recovers depends on a lot of other factors. Your doctor will assess and discuss with you if prolonged continuation of RRT is beneficial.

Risks and complications

General risks:

- Bleeding: Bleeding occurs during haemo-catheter insertion or catheter removal. It may also due to puncture of artery inadvertently. Bleeding risk is higher in kidney failure patients because the clotting function is usually poorer. In very rare situation, the bleeding can be so severe to be life-threatening. In extremely rare conditions, bleeding may cause compression on the airway and impair breathing, injury to internal organs and air embolism, which can be life- threatening.
- Injury of the lung which is in the vicinity of neck veins during hemo-catheter insertion result in air or blood collection between the lung and the chest wall (Pneumothorax or Haemothorax).
- Catheter site and related bloodstream infection.
- There is a risk of catheter fracture or rupture up to about 4% in certain types of catheter of implanted central venous access devices, which may result in catheter displacement requiring removal or re-insertion.
- Catheter adhesion or fracture along the catheter course under the skin may cause retained segment in the body.

Other risks:

- Hypotension, hypothermia, arrhythmias and electrolyte imbalance are common during the procedure. If severe, the RRT procedure may need to be terminated.
- Clotting of the circuit and hemolysis leads to blood loss.
- Venous blood clotting (Thrombosis) or narrowing may be due to prolonged catheter used. Rarely, the blood clot may break off and obstruct the lung (Pulmonary embolism) leading to a potential life- threatening situation.
- In very rare situation, too rapid waste clearance and fluid shifting inside the body compartments during dialysis may cause convulsion and serious neurological deficit due to brain swelling (Dialysis disequilibrium syndrome)

Possibility that the procedure cannot be carried out

Depends on patient's condition, e.g. haemodynamic instability and no vascular access.

Other treatment options

If the patient chooses not to perform this procedure, it may affect their overall condition. A variety of clinical factors can impact the degree of change, including the individual patient's physical condition before the onset of illness, the type of disease, the response to treatment and the progress, etc. Your doctor will explain other suitable options to you.

Disclaimer

The information provided in this booklet is for general reference only. The risks and complications listed above are not exhaustive. Please consult your attending doctor for details.