Medication in paediatric transplant

Catriona Johnston

Medication used in transplant

* Immunosuppressants
* Antibiotics
* Antivirals
* Statins

Immunosuppressants

* Ciclosporin
* Tacrolimus
* Sirolimus
* Azathioprine
* Mycophenolate motifel
* Steriods

Ciclosporin

* First line immunosuppressant post transplant as available intravenously.
* Calcineurin inhibitor – works by reduces the proliferation of T cells
* It is always given twice a day
* Levels should be taken as trough (i.e. before the next dose)

Ciclosporin

Available as capsules 10mg, 25mg, 50mg and 100mg
Liquid 100mg/ml
Injection 250mg/5ml

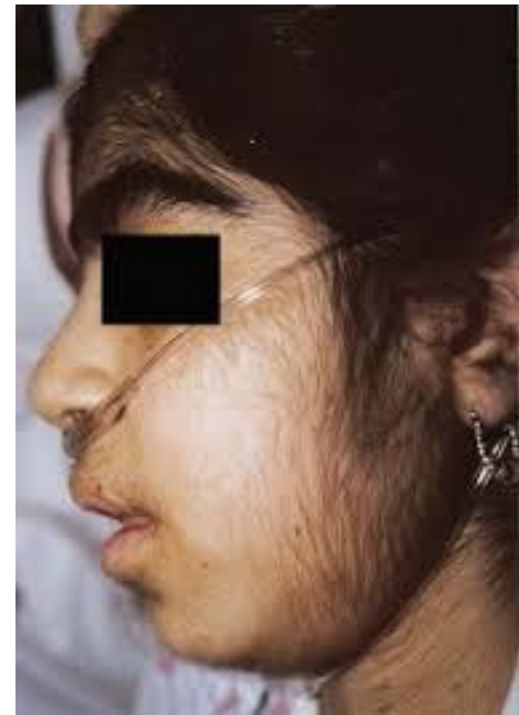
When giving IV or NG ciclosporin it must be given by a PVC free giving set

Side effects of ciclosporin

* Nephrotoxicity.
* Decreased white blood cells and platelets
* Increased risk of infection
* Risk of malignant skin changes
* Increase in liver function tests
* Hypertension
* Hypomagnesaemia
* Hyperglycaemia
* Hyperkalaemia
* Increase in blood lipids.

Reasons for changing to Tacrolimus

* Cosmetic
* Rejection
* Unstable levels.



How we treat side effects of ciclosporin

* Watch for medication that can cause kidney problems – ibuprofen
* Ensure sunscreen even in may not seem sunny – factor 50
* Treat hypomagnesiumia
* Treat hypertension – amlodipine/enalapril
* Regular monitoring
* Check for interactions – ask the ward pharmacist

Tacrolimus

* Second line if ciclosporin is not appropriate.
* Also calcineurin inhibitor and reduce proliferation of T cells
* Always ensure the same brand is prescribed
* Check for interactions – ask the ward pharmacist
* Can cause QT prolongation
* Can cause ischaemic coronary artery disorders
* Levels may change with diarrhoea may increase

Preparations of Tacrolimus

We have a newcastle special liquid, tacrolimus 1mg/ml
Also capsules, generally we always use Prograf,
500 microgram, 1mg ,5mg are kept in NUTH.

Side effects

* Increased risk of infection
* GI perforation
* Risk of malignant skin changes
* Decreased pancytopenia
* Hyperglycaemia
* Increase blood lipids
* Low magnesium, phosphate and sodium
* Insomnia
* Hypertension
* Jaundice
* Nephrotoxicity

Calcineurin Inhibitor Levels

* Levels are generally higher the nearer the patient is from transplant
* Levels decrease over time
* Levels may need to be increased if rejection
* Decreased if PTLD or renal failure

Azathioprine

* Generally all patients start on Azathioprine post transplant once well fed.
* Works on the B cells in low doses by interfering with the production of DNA and stopping cells dividing and multiplying.
* In higher doses also works on T cells
* Azathioprine is cytotoxic

Preparations of azathioprine

* Also available in oral suspension 50mg/5ml
* Injections where possible should be made in pharmacy
* Tablets should not be crushed or halved – use liquid instead

Side effects of Azathioprine

* Increased risk of infection
* Pancytopenia
* Pancreatitis
* Alopecia
* Liver impairment
* Risk of malignant skin changes
* Renal impairment
* Hypersensitivity reactions
* Interstitial pneumonia.
* Gastric ulceration

Monitoring to prevent toxicity

* Monitor white blood cells, platelets and Haemoglobin
* Suspend if low platelets
* Suspend in white blood cells less than 4 (aim for WCC should be 4-6)
* Suspend if deranged liver function tests.

Reasons to switch to Mycophenolate Mofetil

* Low blood count but want another agent
* Rejection
* Unable to tolerate azathioprine
* High HLA antibodies.

Mycophenolate mofetil (MMF)

* An alternative to Azathioprine as second agent
* Inhibits immunologically mediated inflammation which inhibits proliferation of T and B cells
* Not to be confused with mycophenolic acid
* There is potential to be changed to myfortic to reduce gastric side effects

Preparations of MMF

Side effects of MMF

* Increased risk of infection
* Risk of malignant skin changes
* Increased risk of digestive adverse events
* Pancytopenia
* Acidosis
* Changes in electrolytes
* Increased blood lipids
* Gout
* Agitation
* Convulsions
* Tachycardia
* Changes in liver and renal function

Sirolimus

* Also an immune suppressant – but works slightly differently
* May be used if Stomach problems with MMF or low WCC with Azathioprine
* To reduce the amount of ciclosporin/tacrolimus required if patients have poor renal function
* Potentially prevents worsening coronary artery disease
* Always give in the morning

Sirolimus yeah

Tablets also available as 0.5mg and 1mg

Sirolimus levels

* As a true level if only single against aim for 15
* However generally aim for levels about 5 – (sirolimus is normally used with another agents
  * Helps to minimise side effects

Side effects

* Risk of malignant skin changes
* Increased risk of infection
* Impaired wound healing
* Increase in blood lipids
* Pancytopenia
* Hypertension
* Tachycardia
* Pancreatitis
* Hyperglycaemia
* Increase in creatinine
* Oedema
* Pneumonitis

Special warning sirolimus

* Oral solution should be stored in the fridge
* Clearance may be reduced in poor renal function
* Not to be given with patients allergic to peanuts and soya.

Steroids

* All patients will receive three doses of methylprednisolone post operatively
* Over 5 patients will get 0.2mg/kg for 6 weeks and then gradually weaned
* Teenagers get 1mg/kg until first biopsy and then gradually reduced to 0.2mg/kg
* May change depending on rejection and renal function
* Always should be given in the morning.

Antibacterials

* Aciclovir should always be given for at least 3 months post heart transplant to prevent viral infection
  * If over 2 – 200mg tds, or under 2 100mg tds, but dose should be reduced in poor renal function
* Chlorhexidine mouth wash – 5mls-10mls twice a day to prevent mouth infections (alcohol free is available

Co-trimoxazole

Weight	Body Surface Area (BNFc)	Dose	Presentation
4.5-6kg	0.28-0.36	144mg OD	3ml of 240mg/5ml
7-9kg	0.37-0.47	192mg OD	4ml of 240mg/5ml
10-16kg	0.48-0.69m^2	240mg OD	5ml of 240mg/5ml
17-26kg	0.70-0.96m^2	384mg OD	8ml of 240mg/5ml
27-43kg	0.97-1.3m^2	480mg OD	5ml of 480mg/5ml or 1 x 480mg tablet
44-75kg	1.4-1.9m^2	768mg OD	8ml of 480mg/5ml or 1½ x 480mg tablets
>76kg	>2m^2	960mg OD	10ml of 480mg/5ml or 1 x 960mg tablet

Statins

* Statins are used post transplant to prevent coronary artery disease which can occur post transplant
* Generally started aged 5 when can express painful legs
* Patients should have CK level checked, to prevent rhabomyolysis
* This should always be given at night

Any questions