MONOGRAPH

Cidofovir Monograph - Paediatric

Scope (Staff):	Medical, Pharmacy, Nursing
Scope (Area):	All Clinical Areas

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this DISCLAIMER

HIGH RISK MEDICINE

QUICKLINKS

DRUG CLASS

Antiviral.[1]

Cidofovir is a High Risk Medicine.

INDICATIONS AND RESTRICTIONS

Cidofovir is used for the treatment of viral infections resistant to other agents in immunosuppressed patients post-transplant. Cidofovir has activity against: adenovirus, cytomegalovirus (CMV), herpes simplex virus, varicella zoster virus and BK virus.[2, 3]

IV: Restricted (red) antiviral

ChAMP approval is required prior to prescription.

CONTRAINDICATIONS

- Hypersensitivity to cidofovir, probenecid or any component of either formulation.[1, 2]
- Cidofovir is contraindicated in patients with pre-existing renal impairment (eGFR < 55 mL/minute, serum creatinine > 130 micromol/L or proteinuria ≥ 2+) or concurrent use of other nephrotoxic medications as it may result in severe and/or permanent renal impairment.[1-5]

PRECAUTIONS

- Cidofovir should be used with caution in patients with a sulfonamide allergy due to the requirement to administer with probenecid which contains a sulfonamide side chain. There is a low risk of cross-sensitivity and patients should be closely monitored for any reaction.[3]
- Cidofovir is potentially mutagenic, teratogenic and carcinogenic and should be treated as a cytotoxic agent with the appropriate handling precautions.[3, 6] Refer to policy Cytotoxic/Biotherapy Agents Administration for further information.
- Cidofovir is nephrotoxic
    - Patients should be given adequate hydration during cidofovir therapy as dehydration increases the risk of nephrotoxicity.[2, 3]
    - The risk of nephrotoxicity from cidofovir is reduced by co-administration of oral probenecid and IV fluids (before and after the cidofovir infusion).[2, 5, 7] See below in 'dosing' section for more information.
    - Where possible other nephrotoxic agents (e.g. liposomal amphotericin, aminoglycosides, non-steroidal anti-inflammatory drugs, diuretics) should be ceased prior to commencing cidofovir.[5]
- Sexually active adolescent females should use effective contraception whilst taking cidofovir and for at least 30 days after ceasing therapy. Adolescent females should also have a negative pregnancy test prior to commencement. [1, 2]
- Sexually active males are recommended to use barrier contraception during and for a minimum of 90 days after treatment with cidofovir.[1-3]
- Care should be taken in patients with neutropenia due to the risk of a further drop in the neutrophil count.[2, 3]

FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- 375 mg/5 mL vial for injection

Imprest location: Formulary One

DOSAGE & DOSAGE ADJUSTMENTS

Neonates: Not routinely used in neonates, contact infectious disease or clinical microbiology consultants for advice.

Dosing of cidofovir should be accompanied by oral probenecid and adequate IV hydration with sodium chloride 0.9% to reduce the risk of nephrotoxicity.

IV:

- ***Adenovirus:***

5 mg/kg/dose ONCE weekly for TWO to THREE weeks.[2, 3]

Depending on response, the dose may be reduced to 5 mg/kg/dose given once every TWO weeks or 1 mg/kg/dose given three times weekly.[2, 3]

- ***BK virus:***

3 to 5 mg/kg/dose given once every ONE to TWO weeks. Total duration of therapy depends on response.[2]

- ***Cytomegalovirus (CMV):***

5 mg/kg/dose ONCE weekly for TWO weeks. Dose should then be reduced to 5 mg/kg/dose once every TWO weeks. Total duration of therapy depends on the degree of immunosuppression and response to therapy.[2]

- ***Aciclovir resistant Herpes simplex virus (HSV) infection:***

5 mg/kg/dose ONCE weekly for THREE weeks.[2, 3] Dose should then be reduced to 5 mg/kg/dose once every ONE to TWO weeks. Total duration of therapy depends on the degree of immunosuppression and response to therapy.[2]

Hydration with IV sodium chloride 0.9%:

- 10 mL/kg to 20 mL/kg (to a maximum of 1000 mL) over 1 hour immediately prior to the cidofovir infusion **AND** 10 mL/kg to 20 mL/kg (to a maximum of 1000 mL) over 1 hour during cidofovir infusion **AND** maintenance fluids for 2 hours post infusion.[2]

Probenecid (oral):

- 25 to 40 mg/kg/dose (to a maximum of 2 grams) 3 hours before infusion AND
- 10 to 20 mg/kg/dose (to a maximum of 1 gram) at 2 and 8 hours after infusion.[1-3]
- Each dose should be taken with food to reduce the incidence of dose related nausea and vomiting.[1, 2]
- Probenecid is available as a 500 mg tablet; where possible, doses should be rounded to the nearest portion of a tablet to aid in administration. Tablets may be dispersed in 10 to 20 mL of water for patients unable to swallow the tablets whole.[8]

Infusion time-line

3 hours pre-infusion	Administer oral probenecid: 25 to 40 mg/kg/dose (to a maximum of 2 grams)
1 hour pre-infusion	Commence hydration: 10 mL/kg to 20 mL/kg (to a maximum of 1000 mL) over 1 hour
Commence cidofovir infusion (1 hour infusion)	Continue hydration: 10 mL/kg to 20 mL/kg (to a maximum of 1000 mL) over 1 hour
Immediately post cidofovir infusion	Continue maintenance fluids for 2 hours after completion of the infusion.
3 hours after commencement of cidofovir infusion (2 hours post completion of infusion)	Administer oral probenecid: 10 to 20 mg/kg/dose (to a maximum of 1 gram)
9 hours after commencement of cidofovir infusion (8 hours post completion of infusion)	Administer oral probenecid: 10 to 20 mg/kg/dose (to a maximum of 1 gram)

Renal impairment:

- eGFR calculator
- Cidofovir is contraindicated in patients with a creatinine clearance of < 55 mL/min.[1]

Adjustments for baseline renal function:

- eGFR ≥ 55 mL/minute/1.73m^2 = normal dose
- eGFR < 55 mL/minute/1.73m^2, proteinuria ≥ 2+ and/or serum creatinine >130 micromol/L = contraindicated.[1-5]

Adjustments based on treatment related renal impairment:

- In the event of a treatment related rise in serum creatinine > 130 micromol/L, eGFR < 90 mL/minute/1.73m^2 or proteinuria ≥ 2+ discuss with Infectious Diseases (ID) for further advice. Dose reductions will be required.[2]
- In cases where the serum creatinine increases more than 45 micromol/L above baseline or ≥ 3+ proteinuria, cidofovir should be ceased.[2]

Hepatic impairment:

- There are no dose adjustments required.[2]

Dosing in Overweight and Obese Children: There is very limited information regarding dosing of cidofovir in overweight and obese patients. Given the volume of distribution, consideration should be given to dosing based on adjusted body weight on a case-by-case basis.[9]

RECONSTITUTION & ADMINISTRATION

Cidofovir should be handled as a cytotoxic agent.

- Refer to policy Cytotoxic/Biotherapy Agents Administration for further information regarding handling and administration of cytotoxic agents.

Reconstitution:

- Cidofovir infusion should **not** be prepared by staff on the ward – the order must be sent to Pharmacy Compounding Service (PCS) for preparation in a cytotoxic drug safety cabinet.[6]
- The maximum concentration is 8 mg/mL.[6]

Administration:

- Prior to, during and following administration, ensure adequate hydration and probenecid have been given as outlined in the dosing section.
- Cidofovir should be infused over a minimum of 60 minutes via IV infusion into a vein with adequate blood flow in conjunction with hydration fluids. This ensures rapid dilution and distribution of the cidofovir.[6]
- Probenecid should be taken with food.[1]

COMPATIBILITY *(LIST IS NOT EXHAUSTIVE)*

Compatible fluids:

- Sodium chloride 0.9%
- Glucose 5%
- Glucose 5% with Sodium Chloride 0.9%[3, 6]

Compatible at Y-site:

Compatibilities of IV drugs must be checked when two or more drugs are given concurrently.

MONITORING

- Cidofovir is nephrotoxic
    - Need for treatment should be assessed if the serum creatinine increases by 25-35 micromol/L from the baseline levels or if proteinuria is persistently ≥ 2+.[3]
    - Treatment should be ceased if serum creatinine increases by more than 45 micromol/L or if proteinuria is ≥ 2+.[1-3]
- Neutrophil count (FBC), creatinine, serum phosphate, serum bicarbonate, uric acid, hepatic function (LFTs) and urinary protein and glucose levels should be checked in the 48 hours prior to every infusion.[1-3]
- The patient should also be monitored for intraocular pressure, visual acuity, uveitis and iritis at baseline and in the event of intraocular pressure decreasing, the need for treatment should be reconsidered.[1, 2]

ADVERSE EFFECTS

Common: anorexia, alopecia, asthenia, candidiasis, cough, fever, nausea, vomiting, diarrhoea, dyspnoea, nephrotoxicity (proteinuria, elevated serum creatinine, renal failure), decreased serum bicarbonate, neutropenia, headache, chills, decreased intraocular pressure, uveitis, iritis, rash.[1, 3]

Rare: metabolic acidosis, pneumonia, pancreatitis, hepatic insufficiency and Fanconi syndrome.[1, 2]

STORAGE

- Vials should be stored below 25˚C[5]
- Solutions prepared by Pharmacy Compounding Service (PCS) should be kept refrigerated between 2 and 8˚C.[6]
- Ensure the solution is allowed to reach room temperature prior to administration.[5]

INTERACTIONS

This medication may interact with other medications; consult PCH approved references (e.g. Clinical Pharmacology), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

Please note: The information contained in this guideline is to assist with the preparation and administration of **cidofovir**. Any variations to the doses recommended should be clarified with the prescriber prior to administration

Related CAHS internal policies, procedures and guidelines
Antimicrobial Stewardship Policy
ChAMP Empiric Guidelines and Monographs
KEMH Neonatal Medication Protocols
Cytotoxic/Biotherapy Agents Administration

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