PROTOCOL

The Clatterbridge Cancer Centre NHS Foundation Trust

Systemic Anti Cancer Therapy Protocol

Cyclophosphamide Peripheral Blood Stem Cell (PBSC) Mobilisation

PROTOCOL REF: MPHAPBSCM
(Version No. 1.0)

Approved for use in:

Stem cell harvesting for patients with myeloma, amyloidosis and POEMS syndrome

Dosage:

Drug	Dose	Route	Frequency
Mesna*	750mg/m^2	IV infusion	Two doses on day 1
Mesna**	1200mg	Oral	Two doses on day 1
Cyclophosphamide*	1500mg/m^2	IV infusion	Once only on day 1
Filgrastim	Dose based on weight. See treatment schedule	S/C injection	Daily from day 5
*Dosing BSA will be capped at 2m^2 **Mesna oral flat dosing based on 600mg/m^2 with a BSA 2m^2			

Single cycle prior to stem cell harvesting.

Administration & Counselling:

- Patients should be counselled on self-administration of filgrastim or ensure district nurse referral is completed
- Advise patients to maintain fluid intake of 2-3 litres on the day 1, and for next few days.
- Advise patients to report haematuria.

Emetogenic risk:

Moderately emetogenic.

Supportive treatments:

- Allopurinol 300mg once daily for 3 days starting the day of cyclophosphamide (reduce dose in poor renal function)
- Ondansetron 8mg twice a day for 5 days
- Mesna as described in the treatment schedule

Extravasation risk:

Cyclophosphamide: non-vesicant

Refer to the CCC policy for the 'Prevention and Management of Extravasation Injuries'

Dosing in renal and hepatic impairment:

There is little evidence to guide on correct dosage in renal impairment. The largest series of cyclophosphamide-primed patients in this setting is the Arkansas series in which doses of 3 g/m^2 were used. It is probably acceptable not to dose reduce in this setting although it is possible that there may be a slight increase in associated toxicity.

This, however, should not be detrimental to PBSC mobilisation.

Interactions:

Cyclophosphamide is inactive, but is metabolised in the liver, mainly by CYP2A6, 2B6, 2C9, 2C19 and 3A4, into two active metabolites. Care should be taken when using cyclophosphamide with known inducers/inhibitors of these metabolic pathways

Treatment schedule:

Day	Drug	Dose	Route	Diluent and rate
1	**Allopurinol**	300mg	**PO**	Once daily for 3 days
	Ondansetron	8mg	**IV**	100mL sodium chloride 0.9% Over 15 minutes ***30 minutes prior to cyclophosphamide infusion***
	Mesna	750mg/m^2	**IV**	100mL sodium chloride 0.9% Over 15 minutes ***To be given immediately prior to cyclophosphamide infusion***
	Cyclophosphamide	1500mg/m^2	**IV**	500mL sodium chloride 0.9% Over 2 hours
	Mesna	750mg/m^2	**IV**	100mL sodium chloride 0.9% Over 15 minutes ***To be given 3 hours after the start of the cyclophosphamide infusion***
	Mesna	1200mg	**PO**	***To be given 6 hours after the start of the cyclophosphamide infusion***
	Mesna	1200mg	**PO**	***To be given 9 hours after the start of the cyclophosphamide infusion***
	Ondansetron	8mg	**PO**	Twice Daily PRN for 5 days
5	**Filgrastim**	**<70kg:** 30 million units **≥70kg:** 48 million units	**SC**	Once daily until stem cell apheresis complete

Main toxicities:

Immediate: Nasal stuffiness (can be reduced by slowing rate of administration), dizziness Short term: haemorrhagic cystitis, nausea and vomiting (high risk and may be delayed up to 48 hours after infusion), diarrhoea, anorexia, taste changes, neutropenia Long term side effects: bone marrow suppression, alopecia, infertility (most cases reversible), renal and hepatic impairment.

Dose Modifications and Toxicity Management:

N/A

Investigations and treatment plan:

	Pre harvesting	Ongoing / Comments
Informed Consent	X	
Clinical Assessment	X	As clinically indicated
FBC including CD34+	X	Further tests as clinically indicated
U&E & LFTs & Magnesium	X	
CrCl (Cockcroft and Gault)	X	
Height/Weight recorded	X	
Virology (as per current EBMT guidance)	X	

References:

1. https://www.medicines.org.uk/emc cyclophosphamide SPC. [Accessed July 2022]
2. OUH NHSFT: Cyclophosphamide Priming Prior to PBSC Harvest. Available at: http://nssg.oxford-haematology.org.uk/bmt/priming/B-2-20b-cyclo-priming-for-pbsch-in-myeloma.pdf . [Accessed July 2022]
3. BNF available via: https://bnf.nice.org.uk/

Circulation/Dissemination

Date added into Q-Pulse	14th July 2023
Date document posted on the Intranet	N/A

Version History

Date	Version	Author name and designation	Summary of main changes
3/2/23	1.0	**Daniel Dutton – Advanced Pharmacist**	New protocol created