ISATUXIMAB WITH POMALIDOMIDE AND DEXAMETHASONE

INDICATION

Relapsed/refractory multiple myeloma after receiving 3 prior lines of therapy including lenalidomide and a proteasome inhibitor

This treatment combination is currently unlicensed. It is available as part of an Early Access Scheme (EAMS)

TREATMENT INTENT

Disease modification

GENERAL PRE-ASSESSMENT

1. Ensure all the following staging investigations are done:
   - FBC & film
   - Clotting screen
   - U&E
   - LFTs
   - Calcium
   - Albumin
   - Uric acid
   - CRP
   - Baseline random blood glucose level
   - Virology: EBV, CMV, Hep B, Hep C, HIV serology
   - Consider annual flu and pneumococcal vaccination pre therapy
   - Calculated creatinine clearance (CrCl), urine protein/creatinine ratio
   - Electrophoresis and immunofixation for quantitation of serum paraprotein and immunoglobulins.
   - Serum free light chain assay (Freelite)
   - β2 microglobulin
   - LDH
   - Myeloma FISH should be performed in all patients at diagnosis, and in selected patients at relapse/progression to help guide treatment decisions. Samples should be sent to Wessex Regional Genetic Laboratory, Salisbury District Hospital, Salisbury, Wiltshire, SP2 8BJ.
   - Urine pregnancy testing for pre-menopausal women younger than 55 before each cycle.
   - Send a "group and save" sample to transfusion and inform patient and transfusion laboratory that patient is due to commence isatuximab. Patient will require red cell phenotyping as cross match fails due to binding of isatuximab to red cells.

This is a controlled document and therefore must not be changed
Myeloma group

- Imaging as per NICE/network guidance and clinical presentation

Additional Investigations
1. Plasma viscosity if hyperviscosity suspected
2. If allogeneic transplant an option: Tissue typing of patient and siblings and CMV serology
3. Counselling about risks in pregnancy - There are no available data on isatuximab use in pregnant women. Animal reproduction toxicity studies have not been conducted with isatuximab. Immunoglobulin G1 monoclonal antibodies are known to cross the placenta after the first trimester of pregnancy. The use of isatuximab in pregnant women is not recommended. Women of childbearing potential treated with isatuximab should use effective contraception during treatment and for at least 5 months after cessation of treatment. Patients must also comply with pregnancy prevention programme for pomalidomide.
4. Consent - ensure patient has received adequate verbal and written information regarding their disease, treatment and potential side effects. Document in medical notes all information that has been given.
5. Fertility - all patients should be offered fertility advice, as appropriate.
6. Hydration - fluid intake of at least 3 litres/day should be attempted.
9. Treatment must be agreed at the relevant MDT.

Regimenspecific Pre-Assessment
1. Ensure patients are given a Patient ID Card for isatuximab and are instructed to carry this for 6 months after stopping treatment.
2. Advise patients to inform their other HCPs that they have received isatuximab, particularly before a transfusion and to show their patient ID card to healthcare professionals that treat them.
3. Obtain written consent for the treatment including signing Celgene Pregnancy Prevention Programme forms, relating to pomalidomide.
**DRUG REGIMEN:**

<table>
<thead>
<tr>
<th>Cycle 1</th>
<th>Pre-meds</th>
<th>Isatuximab</th>
<th>Dexamethasone</th>
<th>Pomalidomide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paracetamol 1g PO, Chlorphenamine 10 mg IV, Ranitidine 50mg IV Dexamethasone, see below montelukast 10 mg PO</td>
<td>10mg/kg Intravenous infusion</td>
<td>40mg if &lt;75 years, OR 20mg if ≥75 years</td>
<td>4mg PO daily on days 1-21</td>
</tr>
<tr>
<td>To be given 30 minutes prior to isatuximab infusion</td>
<td>Days 1, 8, 15 and 22</td>
<td>Days 1,8,15,22</td>
<td>NOCTE</td>
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</table>

<table>
<thead>
<tr>
<th>Cycle 2 onwards</th>
<th>Pre-meds</th>
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**Additional Post-medications:** the use of post-infusion medications (e.g. inhaled corticosteroids, short and long acting bronchodilators), should be considered for patients with a history of chronic obstructive pulmonary disease to manage respiratory complications should they occur. Following the first four infusions, if the patient experiences no major IRRs, these inhaled post-infusion medications may be discontinued at the discretion of the physician.

**INFUSION RATES**

Isatuximab infusion should be administered intravenously at the infusion rate presented in the Table below. Incremental escalation of the infusion rate should be considered only in the absence of infusion reactions.
Dilution volume | Initial rate | Absence of infusion reaction | Rate increment | Maximum rate
--- | --- | --- | --- | ---
First infusion | 250 mL | 175 mg/hour | For 60 minutes | 50 mg/hour every 30 minutes | 400 mg/hour
Subsequent infusions | 250 mL | 175 mg/hour | For 60 minutes | 100 mg/hour every 30 minutes | 400 mg/hour

For more information on infusion reactions, see section “Infusion reactions”. For management of infusion reactions, see section “Managing infusion reactions”

**CYCLE FREQUENCY**
The cycle is repeated every 28 days until disease progression.

**DOSE MODIFICATIONS**

**Haematological**

**Isatuximab:**
In the event of grade 4 neutropenia, isatuximab administration should be delayed until neutrophil count improves to at least 1.0 x 10⁹/L. The use of colony-stimulating factors (e.g. G-CSF) should be considered, according to local guidelines.

**Pomalidomide:**
To initiate a new cycle of Pomalidomide, ANC ≥ 1 x 10⁹/L and Platelets ≥ 50 x 10⁹/L

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Dose Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutropenia:</td>
<td></td>
</tr>
<tr>
<td>ANC &lt; 0.5 x 10⁹/L OR Febrile Neutropenia and ANC &lt; 1.0 x 10⁹/L.</td>
<td>Interrupt Pomalidomide, monitor FBC weekly</td>
</tr>
<tr>
<td>When ANC return to ≥ 1 x 10⁹/L</td>
<td>Resume Pomalidomide at 3 mg OD</td>
</tr>
<tr>
<td>For each subsequent drop ANC &lt; 0.5 x 10⁹/L</td>
<td>Interrupt Pomalidomide</td>
</tr>
<tr>
<td>When ANC ≥ 1.0 x 10⁹/L</td>
<td>Resume pomalidomide treatment at one dose level lower than the previous dose</td>
</tr>
</tbody>
</table>

| Thrombocytopenia: | |
| Platelets < 25 x 10⁹/L | Interrupt Pomalidomide, monitor FBC weekly |
| When Platelets ≥ 50 x 10⁹/L | Resume pomalidomide treatment at one dose level lower than previous dose |
| For each subsequent drop Platelets < 25 x 10⁹/L | Interrupt Pomalidomide |
| When Platelets ≥ 50 x 10⁹/L | Resume pomalidomide treatment at one dose level lower than the previous dose |
If toxicities occur after dose reductions to 1 mg, then discontinue Pomalidomide. Weekly injections of G-CSF can be administered to keep maintain dose intensity (aim to keep neutrophil counts >1.0)

### Pomalidomide dosing levels:

<table>
<thead>
<tr>
<th>Dose level</th>
<th>Oral pomalidomide dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting dose</td>
<td>4mg</td>
</tr>
<tr>
<td>Dose level -1</td>
<td>3mg</td>
</tr>
<tr>
<td>Dose level -1</td>
<td>2mg</td>
</tr>
<tr>
<td>Dose level -1</td>
<td>1mg</td>
</tr>
</tbody>
</table>

### Non-Haematological

**Isatuximab:**

For the management of infusion-related reactions, please see section below “Managing Infusion-related reactions”.

### Pomalidomide

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<tr>
<td>-Grade 3 or 4</td>
<td>-Interrupt pomalidomide</td>
</tr>
<tr>
<td>-When resolved to Grade ≤ 2</td>
<td>- Resume pomalidomide treatment at one dose level lower than the previous dose.</td>
</tr>
<tr>
<td>-Skin rash G2 or G3</td>
<td>-Interrupt or discontinue pomalidomide</td>
</tr>
<tr>
<td>-Skin rash G4 (exfoliative/bullous rash)</td>
<td>-Discontinue pomalidomide</td>
</tr>
<tr>
<td>Angioedema (all grades)</td>
<td>Discontinue pomalidomide</td>
</tr>
</tbody>
</table>

### Renal and Hepatic Impairment

**Isatuximab**

<table>
<thead>
<tr>
<th>Renal</th>
<th>Hepatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on population pharmacokinetic analysis and on clinical safety, no dose adjustment is recommended in patients with mild to severe renal impairment</td>
<td>Based on population pharmacokinetic analysis, no dose adjustment is recommended in patients with mild hepatic impairment. Data in patients with moderate and severe hepatic impairment are limited, but there is no evidence to suggest that dose adjustment is required in these patients.</td>
</tr>
</tbody>
</table>

**Pomalidomide**

<table>
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<th>Hepatic</th>
</tr>
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<tbody>
<tr>
<td>No dose adjustment required in renal impairment On haemodialysis days, patients should take pomalidomide following haemodialysis</td>
<td>Avoid if serum bilirubin &gt; 34 umol/L Careful monitoring is required in hepatic impairment</td>
</tr>
</tbody>
</table>
INVESTIGATIONS – during treatment
- FBC, U&Es, LFTs, Ca**, glucose – every 4 weeks.
- Ig’s, paraprotein, Freelite assay usually monthly
- Consider bone marrow assessment after four cycles for non-secretory Myeloma.

CONCURRENT MEDICATIONS
- Allopurinol 300 mg daily for 7 days for cycle 1 only
- Prophylactic aciclovir 200 mg TDS (consider reducing to 200mg BD if CrCl<10ml/min) for the duration of treatment and for 3 months afterwards.
- Prophylactic fluconazole 50mg OD.
- Consider prophylactic co-trimoxazole 960mg OD on M/W/F if heavily pre-treated or previous autograft.
- Proton pump inhibitor or H2 antagonist at clinician's discretion on days of steroids
- Thromboprophylaxis/anticoagulation see VTE section below.
- Bone protection as per NSSG Bone Protection protocol MM.

EMETIC RISK
Low risk

EXTRAVASATION RISK
Unknown

ADVERSE EFFECTS / REGIMEN SPECIFIC COMPLICATIONS
Isatuximab:
- **Interference with Serological Testing**
  Because CD38 protein is expressed on the surface of red blood cells (RBCs), isatuximab, an antiCD38 antibody, may interfere with blood bank serologic tests with potential false positive reactions in indirect antiglobulin tests (indirect Coombs tests), antibody detection (screening) tests, antibody identification panels, and antihuman globulin (AHG) crossmatches in patients treated with isatuximab.

  I. **Blood Transfusion** must be notified of this interference with serological testing and Blood Bank must be notified that a patient has received isatuximab.

  II. Patients must be typed and screened prior to starting isatuximab.
III. Ensure patients are given a Patient ID Card for isatuximab and are instructed to carry this for 6 months after stopping treatment.

IV. Ask patients to tell their other HCPs that they have received isatuximab, particularly before a transfusion and to show their patient ID card to healthcare professionals that treat them.

- **Interference with Determination of Complete Response**
  Isatuximab is a human IgG kappa monoclonal antibody detectable on both the serum protein electrophoresis (SPE) and immunofixation (IFE) assays used for the clinical monitoring of endogenous M-protein. This interference can impact the determination of complete response and of disease progression in all patients with IgG kappa myeloma.

- **Testing for hepatitis B virus:**

All patients starting on isatuximab must be screened for hepatitis B virus before initiation; patients with unknown serology who are already on treatment should also be screened

Monitoring is required for patients with positive serology for clinical and laboratory signs of hepatitis B reactivation during treatment, and for at least 6 months following the end of treatment.

Patients with positive serology need to be advised to seek medical help immediately if they experience signs and symptoms suggestive of hepatitis B virus reactivation

Treatment with isatuximab should be stopped in patients with hepatitis B virus reactivation; appropriate treatment needs to be instituted in consultation with experts in the treatment of hepatitis B virus infection; consult with experts before resuming isatuximab in patients with adequately controlled viral reactivation.

Suspected adverse drug reactions associated with isatuximab need to be reported to the Yellow Card Scheme.

- **Contraception**
  To avoid exposure to the fetus, women of reproductive potential should use effective contraception during treatment and for 5 months after cessation of isatuximab treatment.

  Patient must comply with pregnancy prevention programme in order to be eligible to receive pomalidomide.

- **Infusion reactions**

Infusion reactions, mostly mild or moderate, have been observed in 38.2% of patients treated with isatuximab. All infusion reactions started during the first isatuximab infusion and resolved on the same day in 98% of the infusions. The most common symptoms of an infusion reactions included dyspnoea, cough, chills and nausea. The most common severe signs and symptoms included hypertension and dyspnoea.
To decrease the risk and severity of infusion reactions, patients should be pre-medicated prior to isatuximab infusion with paracetamol, H2 antagonists or proton pump inhibitors, montelukast, diphenhydramine or equivalent; dexamethasone is to be used as both premedication and anti-myeloma treatment.

Vital signs should be frequently monitored during the entire isatuximab infusion. When required, interrupt isatuximab infusion and provide appropriate medical and supportive measures. In case symptoms do not improve after interruption of isatuximab infusion, recur after initial improvement with appropriate medicinal products, require hospitalization or are life-threatening, permanently discontinue isatuximab and institute appropriate management.

Patients with a history of obstructive pulmonary disorders may require additional post-infusion medications to manage respiratory complications. Consider prescribing short- and long-acting bronchodilators and inhaled corticosteroids for patients with obstructive pulmonary disorders.

- **Managing Infusion related reactions**

  Administration adjustments should be made if patients experience infusion reactions:

  In patients who experience Grade 2 (moderate) infusion reactions, a temporary interruption in the infusion should be considered and additional symptomatic medicinal products can be administered. After improvement to grade ≤1 (mild), isatuximab infusion may be resumed at half of the initial infusion rate under close monitoring and supportive care, as needed. If symptoms do not recur after 30 minutes, the infusion rate may be increased to the initial rate, and then increased incrementally.

  If symptoms do not resolve rapidly or do not improve to Grade ≤1 after interruption of isatuximab infusion, recur after initial improvement with appropriate medicinal products, or require hospitalization or are life-threatening (Grade ≥3), treatment with isatuximab should be permanently discontinued and additional supportive therapy should be administered, as needed.

- **Other common adverse effects:** Upper respiratory tract infections, pneumonia, bronchitis, febrile neutropenia, dyspnoea, diarrhoea, nausea, vomiting.

**Pomalidomide:**

- Venous thromboembolism (VTE): There is an increased risk of thrombosis with pomalidomide. Unless the patient is thought to be at particularly low-risk of thrombosis or high-risk of bleeding, some form of VTE prophylaxis is recommended as follows:

  1. Prophylactic low-molecular weight heparin OR
  2. Prophylactic DOAC e.g. apixaban 2.5mg bd (check product specific information)

  Aspirin can be appropriate for patients with no additional risk factors for thrombosis. It is generally not preferred for patients with additional risk factors.
If VTE occurs, pomalidomide can be continued and the patient should be fully anticoagulated according to standard guidelines.

- Fatigue, dizziness and confusion
- Peripheral neuropathy, diarrhea/constipation, pneumonia, peripheral oedema.

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**TREATMENT RELATED MORTALITY**

<5%

**REFERENCES**


3. Imnovid® (Pomalidomide), eMC UK Summary of Product Characteristics for Janssen,02 May 2019

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**REVIEW**

<table>
<thead>
<tr>
<th>Name</th>
<th>Revision</th>
<th>Date</th>
<th>Version</th>
<th>Review date</th>
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<tbody>
<tr>
<td>Faouzi Djebbari (Haematology Pharmacist)</td>
<td>New protocol</td>
<td>January 2020</td>
<td>1.0</td>
<td>June 2020</td>
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