Steroid use in COVID-19 hyperinflammation

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Introduction

COVID-19 infection, caused by the SARS-CoV2 virus, can result in viral pneumonitis and acute respiratory distress syndrome. A minority of patients require intensive care respiratory support to offset diffuse alveolar damage. A subset of these patients develop a severe hyperinflammatory response.

Use of high dose steroids can be used to treat this maladaptive cytokine storm. The following guidance is a brief overview of the steroid dosages used in these circumstances and how they can be weaned. It should be considered in conjunction with the document "Use of immunomodulatory agents in COVID-19 associated hyperinflammation – interim guidance UHW COVID19 MDT" that discussed alternative treatment options.

Diagnosis of hyperinflammation in COVID19 and decision to use steroids as 1st line treatment.

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IV Methylprednisolone 1mg/kg (max of 100mg) OD for initial 5 days + 40mg Omeprazole IV BD (D1-5)

EARLY RESPONDERS with rapid improvement in inflammatory markers (CRP) and clinical profile. (D6-11)

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Wean MP to 0.5 mg/kg OD for 2 days and then 0.25mg/kg OD for 2 days and then 0.125mg/kg OD for 2 days and then stop.
+
Enteral PPI (Gut working)/OD IV PPI

SLOW RESPONDERS with slow response in inflammatory markers (CRP) and clinical profile. (D6-20)

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Wean MP to 0.5 mg/kg OD for 5 days and then 0.25mg/kg OD for 5 days and then 0.125mg/kg OD for 5 days and then stop.
+
Enteral PPI (Gut working)/OD IV PPI

ADJUNCTIVE THERAPY

1. Patient on high dose IV methylprednisolone should be on IV PPI BD as the risk of clinically significant gastrointestinal bleed increases.

2. High dose of steroid may lead to hyperglycemia, so stricter monitoring along-with high doses of Insulin may be required to achieve target blood sugar.

3. Replacement of Potassium and Magnesium as increased loss whilst on treatment dose of steroid.

MONITORING OF PATIENTS DIAGNOSED WITH CYTOKINE RELEASE SYNDROME AFTER STARTING TREATMENT WITH IV MP

1. Monitor change in P/F ratio, PEEP requirement, lung compliance, $PaCO_2$ and CXR findings.

2. Monitor change in vasopressor dose requirements to achieve target MAP, troponin and BNP.

3. Monitor change in creatinine, fluid balance and potassium (increased risk of hypokalemia with concurrent use of diuretics).

4. Monitor change in ALT/AST.

5. Monitor change in inflammatory markers – CRP, Ferritin, Fibrinogen, Triglycerides and LDH.

6. Monitor temperature and look for change in pattern of fever.

7. Surveillance of markers of fungal infection (serum B-D glucan and Galactomannan) and DNA viruses (HSV, CMV, EBV, VZV) as increased risk/reactivation of above pathogens.

8. Monitor PCT and send appropriate culture samples (NBL, blood and urine MCS) as indicated if concerns regarding bacterial infection.

9. Monitor FBC as usage of steroid may lead to leukocytosis and thrombocytopenia.

10. Monitor for new onset hyperactive delirium or exacerbation of established delirium.