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# Bone Marrow Transplant For Macrophage Activation Syndrome In Systemic Juvenile Idiopathic Arthritis

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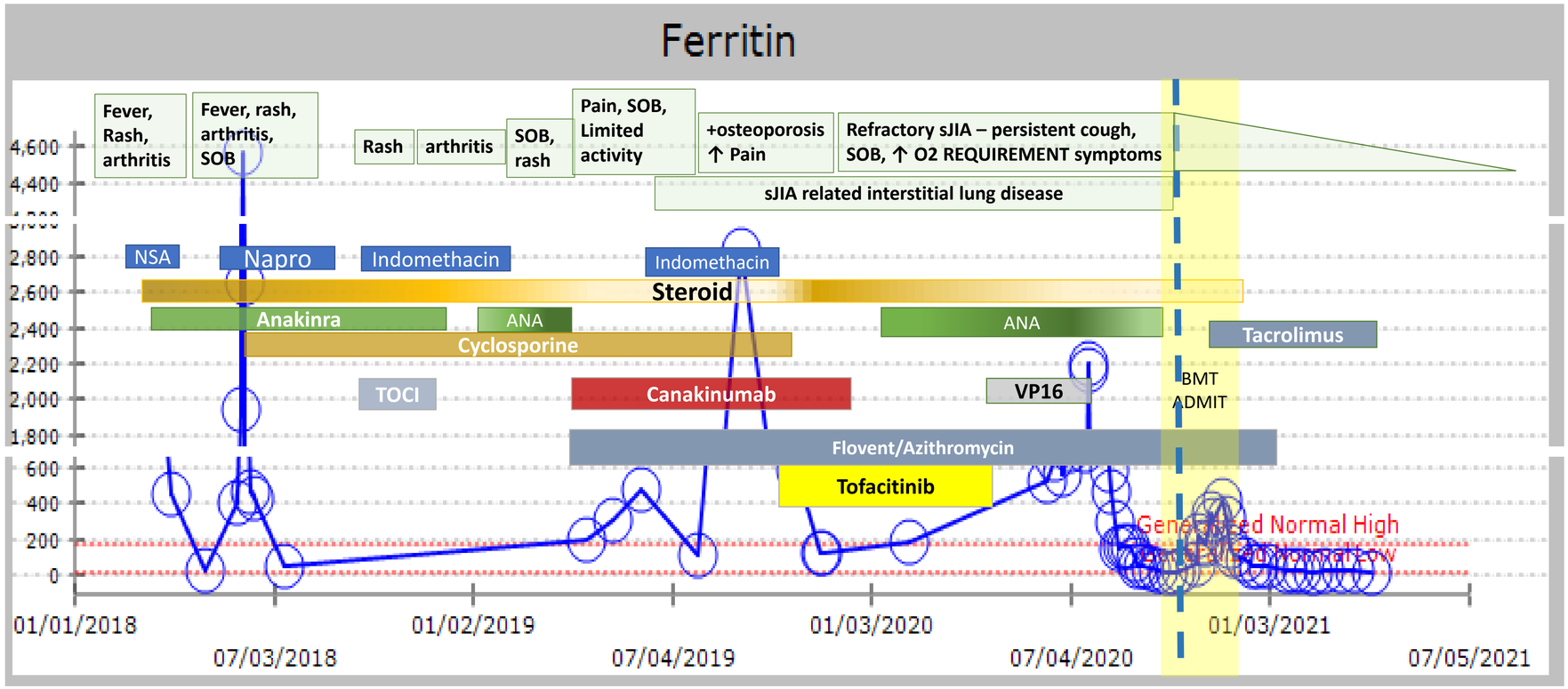
## INTRODUCTION

Recognition of macrophage-activation-syndrome (MAS) in a patient with systemic-juvenile-idiopathic-arthritis (sJIA) is difficult given overlapping clinical manifestations, especially with vital organ involvement

## CASE REPORT

This is a 7 yo with prolonged fever, skin rash and increased inflammatory markers leading to the diagnosis of sJIA. She showed evidence of multiple flares of symptoms with notable elevation of markers for MAS including fibrinogen, ESR, CRP and ferritin. Patient developed sJIA associated interstitial lung disease with minimal control despite escalated immuno-suppressive therapy.

Genetic testing:
- HLA haplotype associated with hypersensitivity reaction to medications
- Genetic variable of unknown significance in the PLCG2 gene




| BMT Conditioning | Dose / Administration | Days Due |
|---|---|---|
| Alemtuzumab | 0.2 mg/kg subcutaneous/day x 5 doses | D-14 to D-10 |
| Fludarabine | 30 mg/m$^2$/day x 5 doses | D-8 to D-4 |
| Melphalan | 70 mg/m$^2$/day x2 doses | D-3 and D-2 |
| **Donor Type: MUD** | **Stem cell source: Bone Marrow** | |

## TRANSPLANT OUTCOMES

- Early ANC engraftment by D+9
- At 2 years post-BMT:
  - No GVHD, no viral reactivation
  - Stable mixed chimerism for two years post HCT
  - Complete drug free remission, with resolved osteopenia, normalized pulmonary function tests and inflammatory markers.
  - CT follow-up showed interval improvement in the septal thickening, tree in bud opacities and centrilobular pulmonary nodules.

## DISCUSSION

In the setting of refractory sJIA, especially with development of MAS not responsive to mono- or polytherapy, bone marrow transplant (BMT) has proven to be curative by replacing the autoreactive cells leading to autoimmune dysregulation.

Complications occur secondary to viral infections given further T-cell depletion in an already immunocompromised host.

In a multi-center retrospective study of BMT in patients with various autoimmune disorders, 67.2% demonstrated long-term clinical response with overall survival (OS) at 5-years 76%.[1]

In another retrospective study, low intensity conditioning produced a similar engraftment response with less comorbidity with an OS of 87.5%, with earlier transplant as a future key in further success.[2]

## REFERENCES

1. Greco et al. Allogeneic HSCT for Autoimmune Diseases: A Retrospective Study From the EBMT ADWP, IEWP, and PDWP Working Parties. Front Immunol. 2019 Jul 4;10:1570.
2. Silva et al. Allogeneic hematopoietic stem cell transplantation for severe, refractory juvenile idiopathic arthritis. Blood Adv. 2018 Apr 10;2(7):777-786.