

## Tozinameran

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**Macrophage-activation-syndrome: case report**

A 20-year-old woman developed macrophage activation syndrome (MAS) following administration of tozinameran for immunisation against COVID-19 infection.

In August 2020, the woman was diagnosed with adult-onset Still's disease (AOSD), which relapsed in February 2021. Thereafter, she received vaccination with tozinameran [BNT162b2; *route and dosage not stated*]. It was reported that, at the time of SARS-CoV-2 vaccination, she was receiving maintenance therapy with anakinra, prednisolone and had been in stable condition for more than 3 months under this therapy. However, after 6 days from the first dose of tozinameran, she reported intermittent fever episodes and severe fatigue. In the following days, she experienced severe a sore throat, nausea, tremor, sweating, myalgia and dizziness. However, arthralgia or skin rash were absent. Hence, she was hospitalised. Laboratory results revealed highly elevated serum ferritin, serum calprotectin, soluble IL-2-Receptor, lactate dehydrogenase, C-reactive protein, triglycerides. There was CD169/SIGLEC1 expression on monocytes, liver along with cholestasis parameters. Moreover, signs of coagulopathy with elevated d-dimers, low fibrinogen with a pancytopenia and, international normalisation ratio of 1.35 (normal: 0.9–1.25) and haemoglobin 10.4 g/dL were evident. PCR test for SARS-CoV-2, as well as blood and urine cultures revealed negative results. Abdominal ultrasound and echocardiography revealed remarkable hepatosplenomegaly and a small pericardial effusion. The HScore was calculated as 272 points which indicated a very high probability with a score of >99% for MAS. hence, she was considered to have MAS.

Therefore, woman's treatment was started with methylprednisolone and intravenous immune-globulin [intravenous immunoglobulins] and her dose of anakinra was increased. Her initial treatment response was moderate; namely, after 4 days, her fever reduced but remained, ferritin levels decreased and cell counts normalised. Eventually, to achieve stable remission, she received additional ciclosporin. After 2 weeks, she was discharged with anakinra at previous dose, ciclosporin and an unspecified steroid tapering regimen. Afterwards, she was advised to recommended to wait for synthetic protein-based vaccine. Thereafter, follow-up over a period of 4 month revealed a disease control with no clinical signs of relapse. During this period she was receiving maintenance therapy with prednisolone [prednisolon], anakinra and ciclosporin. it was further planned to taper the ciclosporin to a reduced dose. Eventually, the development of MAS was attributed to tozinameran.

Muench F, et al. Macrophage activation syndrome in a patient with adult-onset Still's disease following first COVID-19 vaccination with BNT162b2. *BMC Rheumatology* 5: 60, No. 1, Dec 2021. Available from: URL: <https://bmc rheumatol.biomedcentral.com/>

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