| Case Report |

# An elderly man presented with autoimmune haemolytic anaemia- a consequence of severe corona virus disease 19 (COVID-19)

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## Article Info

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## Abstract

Autoimmune hemolytic anaemia (AIHA) can be caused by many diseases like connective tissue disease, lymphoproliferative disorder, certain infections and various medications. The coronavirus disease 19(COVID-19) can cause an increased risk of thrombosis. But, the association of AIHA with COVID-19 is not well understood. Here, in this case report a 45-year-old man who presented with fever, cough, anaemia and splenomegaly. On further investigation, he was confirmed as severe COVID-19 case with AIHA. Subsequently he was managed with prednisolone with good results.

## Introduction

The COVID-19 is a viral illness, was first found in Wuhan city, China in Decenber 2019, and the world health organization(WHO) declared a pandemic in March 2020.[1]

There is conclusive evidence that COVID-19 can cause coagulopathies like some other haematological complications.[2,3] There are only a few cases reported of COVID-19 with autoimmune haemolytic anaemia(AIHA).[4,5] Among the eight cases described in some literature, lymphoma was the causative factor in five cases, and other associations were chronic lymphocytic leukaemia (two) and monoclonal gammopathy of uncertain significance (one).[4,5] Because of a scarcity of data, the relation between COVID-19 and AIHA is unclear. We are describing a case of a middle-aged man with COVID-19 and profound anaemia and splenomegaly due to AIHA and had no known underlying cause of AIHA.

## Case summery

A 45-year-old man of known case of primary hypothyroidism presented with fever, cough and fatigue for one week. On general examination, he had moderate anaemia, pulse rate of 110 beats per minute, blood pressure of 130/80 mm of Hg and oxygen saturation of 89% on room air. He had mild splenomegaly, and other systemic examination findings were normal. He was not from malaria and kala-azar endemic zone and did not travel to such areas. His haematological investigations revealed moderately low hemoglobin in complete blood count(CBC), in peripheral blood film(PBF): red blood cells (RBC) were normochromic, normocytic and here were frequent spherocytes, polychromatic cells and few normoblastic RBC were seen; white blood cells and platelets were norma; suggestive of immune haemolytic anaemia(figure-1); direct Coomb's test was positive and indirect coomb's test was negative(table-1). His imaging study revealed bilateral sub-pleural ground-glass opacities in both lungs on high resolution computed tomography (HRCT) chest suggestive of COVID-19 pneumonia, and ultrasonogram of the abdomen showed mild splenomegaly(14..9 cm). He tested positive for RT-PCR of COVID-19. His other biochemical and immunological tests like serum creatinine, alanine amino- transferase (ALT), blood glucose were normal and anti-nuclear antibody (ANA), anti-double stranded antibody(anti-ds DNA),hepatitis-B virus surface antigen (HBsAg), ant-hepatitis -C virus antibody(anti HCV antibody), human immune deficiency viral screening tests were negative(table-1). All the evidence were pointing towards the diagnosis of AIHA due to COVID-19. So, he was managed with injection remdesisvir for five days with supportive management for COVID-19 and prednisolone 1 mg/kg body weight for AIHA. Upon response, the prednisolone was gradually tapered off after 12 weeks of treatment. Now his haemoglobin level is stable during follow up.

**Table-1**

**Investigations with their results of the patient.**

| Tests | Results(Normal values) |
|---|---|
| Haemoglobin | 7.5 gm/dl |
| White blood cell count | 10X109 /microL |
| Platelet count | 220X109 /microL |
| Creatinine | 0.85 mg/dl |
| Alanine amino transferase(ALT) | 18 IU/L |
| HBsAg | Negative |
| Anti-HCV | Negative |
| Anti-HIV | Negative |
| Anti-nuclear antibody(ANA) | 9 U/ml (Negative) |
| Anti-ds DNA | 9.60 U/ml (Negative) |
| Thyroid stimulating hormone(TSH) | 10.5 µIU/ml |
| Direct coomb's test | Positive |
| Indirect coomb's test | Negative |
| Mountoux test | 2 mm in 72 hours |
| Ultrasonogram of whole abdomen | Mild splenomegaly |
| Chest X-ray | Blilateral pulmonary inflammatory lesion |
| High resolustion CT scan of chest | Bilateral and peripheral ground glass opacities suggestive of COVID-19 pneumonia |

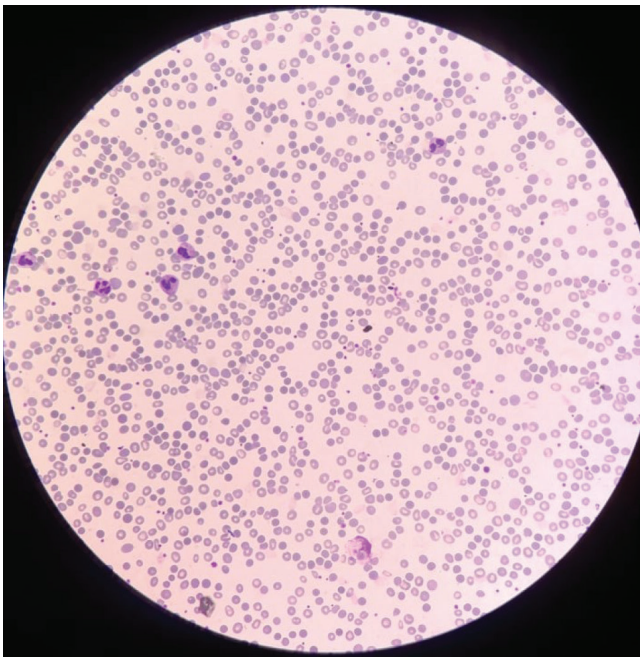

Figure-1: RBC: Normochromic, normocytic. There are frequent spherocytes, polychromatic cells and few nRBC seen; suggestive of immune haemolytic anaemia.

## Discussion

AIHA is a heterogeneous disease entity associated with the destruction of RBC or increased clearance due to antierythrocyte antibodies.[6] The hemolysis occurs in intravscular by activated compliment complex or by antibody and compliment induced phagocytosis and red blood cells are removed.[7] The incidence reported is approximately 1 per 100 000/year. Serologically, cases are divided into warm, cold or mixed types.[8] It is found that there is a increased risk of hematological defects in severe COVID-19 patients sepecifically tcoagulopathies.[9] The overwhelming release of cytokine is the background cause of severe COVID-19, although exact cause is not known.[10] The exact etiology of autoimmune diseases still unknown, but can be caused by viral infections, lymphoma, connective tissue disease, immunodeficiencies, drugs and other infectious agent, that contribute to the trigger of these type of diseases.[11] This reported case is one of the few example of AIHA in COVID-19 patients.[12] This patient had no known underlying trigger factors except COVID-19 viral infection that are typically associated with autoimmune hemolytic anaemia. Our patient had unexplained anaemia with a positive direct coombs test.

His blood count improved with the typical dose of steroid in AIHA, which leads to the strong possibility of AIHA. Yet, there is no potent literature suggestive of the association of COVID and AIHA. Few author postulated that molecular mimicry between Ankyrin-1 in the erythrocyte surface and the viral protein spike is the precipitating event.[13] So far our knowledge goes, there is only a handful number of cases of COVID-19 associated with AIHA, which had both warm & cold variety. But still, the association between warm & cold antibody with COVID-19 remain unknown.

## Conclusion

The hematological manifestation could be diverse in COVID-19. The auto-immune hemolytic anemia is an unproven entity that ca occur in COVID-19. Therefore, we need to be careful while evaluating the patients with anemia in COVID-19.

## Authors' contributions

MNH and SCA has prepared the initial draft. Other authors has analyzed and finally reviewed the manuscript before the submission.

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## Ethical approval

Not applicable as this article contains information of only one patient

## Consent

Written informed consent was taken from the patient for publication of this case report and accompanying images.

## Conflict of interest

The authors declared that there is no conflict of interest.

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