KSN 2021
FULLY VIRTUAL MEETING
September 02 (Thu) - 05 (Sun)

Abstract Submission No. : 2334

SARS-CoV-2 Infection and It's Association With Anti-Glomerular Basement Disease: A Case Series

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Case Study: Abstract
Introduction:

Anti-glomerular basement membrane (GBM) disease is a rare autoimmune disease leading to Rapidly Progressive Glomerulonephritis. There is a recent increase in the cases of Anti-GBM disease since the pandemic of novel SARS-CoV2 infection suggesting a possible association between the two. We report a case series of four patients affected with COVID-19 infection presenting later as Anti-GBM disease.

Methods:

The study was done in Madurai Medical College during the period from September 2020 to March 2021. Four patients having Anti-GBM disease with either COVID RTPCR (swab test) or COVID IgG or IgM antibody positive were taken for the study.
Their clinical features, Anti-GBM titre, renal parameters, renal biopsy pattern, progression to ESKD, response to treatment were studied.

Discussion:

SARS- CoV2 infection by complement activation and inflammation causes pulmonary endothelial injury. This leads to the exposure of the alveolar basement membrane. This events may release the non-collagenase domain of the alfa 3 chain of type 4 collagen [a3(IV)NC1] found primary in the glomerular and alveolar basement membrane into circulation. The circulating NC1 auto antigen then stimulate auto reactive T and B cells resulting in anti-GBM disease. In our study all four patients have either Covid IgG or IgM positive and their anti-GBM titre elevated. One patient was positive for P-ANCA. All four patients were treated with steroids, cyclophoshphomide, plasma exchange. Two patients recovered partially. Two patients became dialysis dependent.

Conclusion:

Our case series study supports the association of Anti-GBM disease and the novel SARS-CoV2 infection.

Table 1. Cases of Anti- GBM Disease Post SARS-CoV2 Infection

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Table 1. Cases of Anti- GBM Disease Post SARS-CoV2 Infection

Case	Case 1	Case 2	Case 3	Case 4
Age and Gender	36/F	18/M	52/M	32/F
Co morbidity	Nil	Nil	Hypertensive	Nil
Smoking status	Nil	Nil	Smoker	Nil
Clinical presentation	Lethargy, Hematuria, Vomiting	Headache, accelerated Hypertension	Volume overload, vomiting	Volume overload, fever, hematuria, oliguria
Preceding clinical SARS CoV2 infection	Present - mild	Present- moderate	Present - mild	Present- moderate
Prodrome duration	4 weeks	8 weeks	6 weeks	4 weeks
Alveolar Hemorrhage	Absent	Absent	Absent	Absent
Hemoglobin	7.8 gm/dl	11gm/dl	8gm/dl	8.2gm/dl
Renal syndrome	AKI	AKI-RRT	AKI-RRT	AKI-RRT
Platelets	2,30,000	1,25,000	1,50,000	1,12,00
Serum Creatinine	3.4mg/dl	7mg/dl	12mg/dl	16mg/dl
C- Reactive Protein	0.7	15	4	65
Anti- GBM titre (Iu/ml; normal <6.9)	287	567	323	386
ANCA	Negative	Positive (p-ANCA)	Negative	Negative
Renal Biopsy	Cresentric glomerular Nephritis, no interstitial fibrosis and tubular atrophy, Linear IgG staining	Cellular and fibrocellular crescents, linear IgG staining, no interstitial fibrosis and tubular atrophy	Circumferential fibrocellular and cellular crescents, linear IgG staining, IFTA 40%	Cellular and fibrocellular crescents, linear IgG staining, no interstitial fibrosis and tubular atrophy
SARS- Cov2 **1.RTPCR** **2. IgG antibody** **3.IgM antibody**	 1.Negative 2.Negative 3.Positive	 1.Negative 2.Negative 3.Positive	 1.Negative 2.Positive 3.Positive	 1.Negative 2.Negative 3.Positive
Treatment	Plasma Exchange, Steroids.	Plasma Exchange, Steroids, Cyclophosphomide	Plasma Exchange, Steroids, Cyclophosphomide	Plasma Exchange, Steroids, Cyclophosphomide
Outcome	Outpatient follow up	Outpatient follow up	On weekly Twice RRT	Inpatient RRT
Last Creatinine	3.8mg/dl	5mg/dl	5.8mg/dl	6.8mg/dl