A Single Centre Based Observational Study on the Antibody Response after COVID-19 Infection

Ritambhara kumari, Atul Kakar, Richa Dewan, Dinesh Kaul, Sanghamitra Dutta

Sir Ganga Ram Hospital

Background

- SARS-CoV-2 activates both innate and acquired immune system and is recognized by antigen presenting cells which stimulate the acquired immune system
- At the time of study conception it was not clear whether recovery from COVID-19 protected against future SARS-CoV-2 infection
- It was also not clear if the antibodies last till 6 months after acute infection.
- Studies with small sample size was available for antibodies with conficting data

AIM

1.To determine the antibody response (total and IgG antibodies) in patients recovering from COVID-19 at various time line

2.How early after acute infection does seroconversion occurs?

METHODOLOGY

Prospective observational study on 153 COVID-19 admitted patients.

Diagnosed patients of COVID-19 with positive RT-PCR or rapid antigen test.

Period of Study - January 2021 to February 2022 after Institutional ethical clearance.

INCLUSION CRITERIA

The inclusion criteria were;

1.Age >18 years

2.Consenting patients.

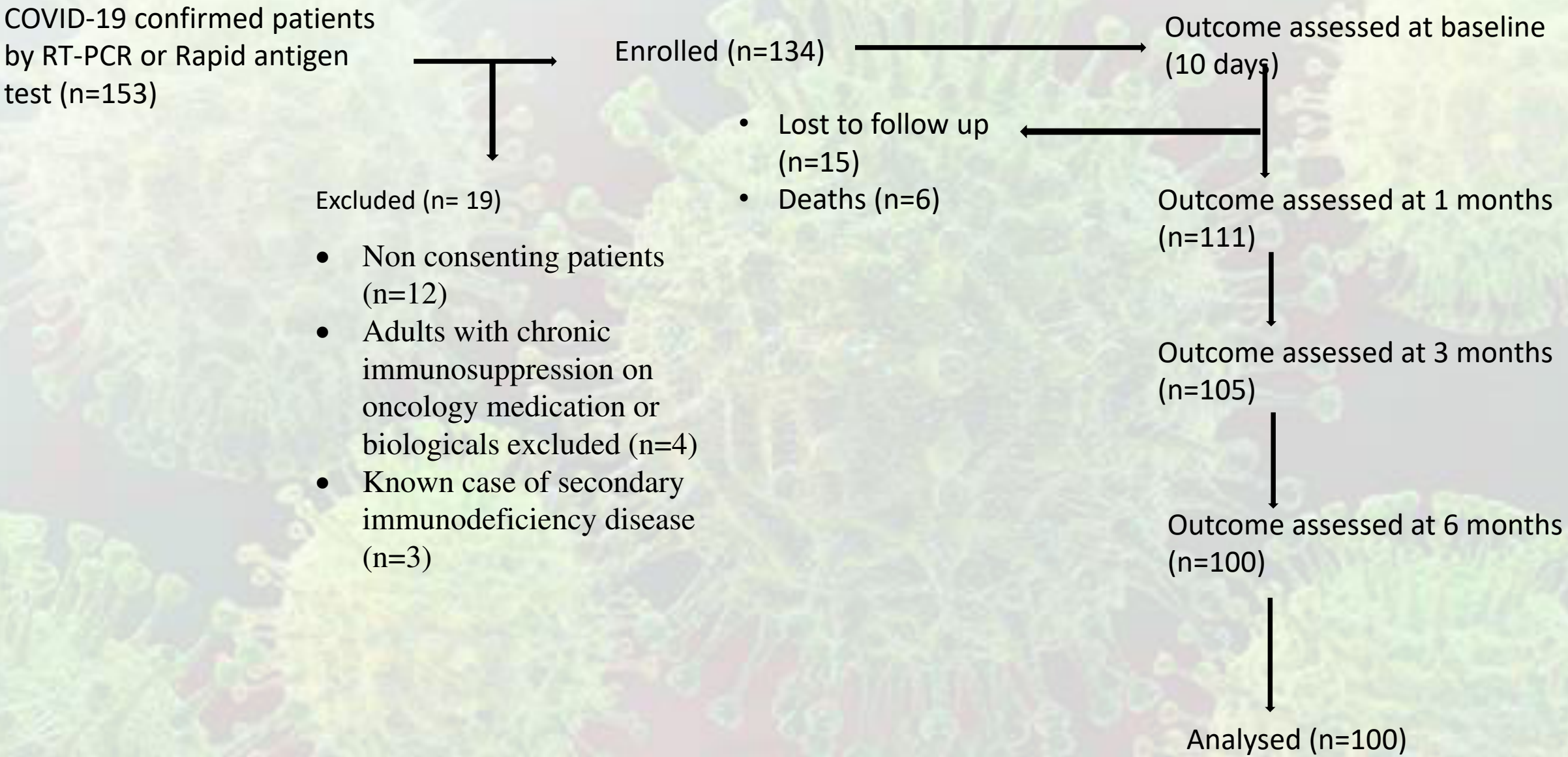
EXCLUSION CRITERIA

1. Patients with clinical symptoms of COVID-19 but who tested negative on RT-PCR or rapid antigen test.

2. Adults with chronic immunosuppression on oncology medication or biologicals were excluded.

3. Known case of primary or secondary immunodeficiency disease.

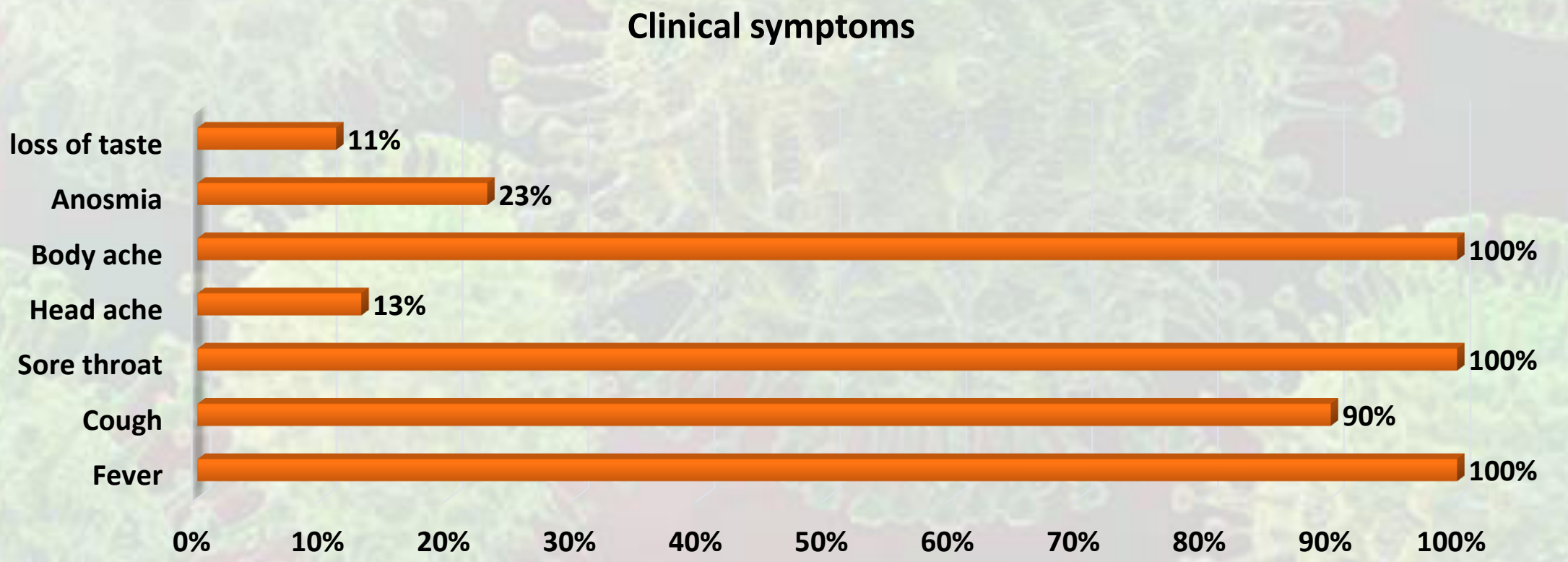
Flow Chart


COVID-19 confirmed patients by RT-PCR or Rapid antigen test (n=153)
Enrolled (n=134)
Outcome assessed at baseline (10 days)
Lost to follow up (n=15)
Deaths (n=6)
Excluded (n= 19)
Non consenting patients (n=12)
Adults with chronic immunosuppression on oncology medication or biologicals excluded (n=4)
Known case of secondary immunodeficiency disease (n=3)
Outcome assessed at 1 months (n=111)
Outcome assessed at 3 months (n=105)
Outcome assessed at 6 months (n=100)
Analysed (n=100)

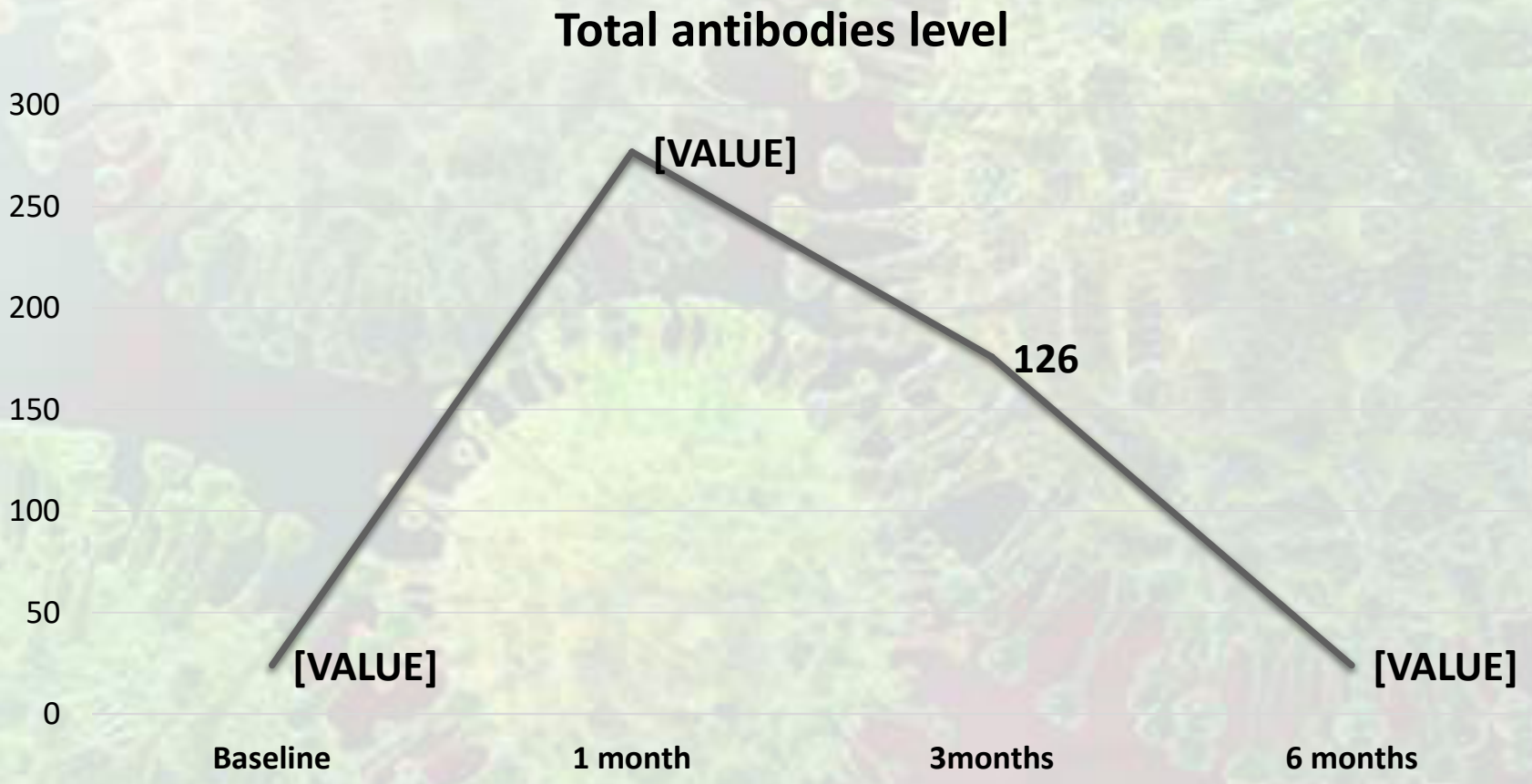
RESULTS

In this study, 67 (67%) participants were males and 33 (33%) were females. The age of the study participants ranged from 25-82 years with mean (±SD) age of 49.5 (±14) years.

Clinical symptoms had a varied presentation



Trend of total antibodies (IgA, IgM, IgG)



Total antibodies	Mean (±SD)	Median	Range
At baseline	24 (±17)	19	0-67
1 month	277 (±48)	143	111-432
3 months	126 (±35)	104	81-235
6 months	24 (±17)	19	0-68

Trend of IgG antibodies

IgG antibodies	Mean(±SD)	Median	Range
At baseline	0.68(±1.7)	0	0-7
1 month	166(±72)	105	49-329
3 months	101(±20)	77	54-134
6 months	14(±7.7)	12	0-34

- These antibodies did not vary with any variables like age, sex , BMI and diabetes with p- value 0.972, 0.791, 0.804, 0.742 respectively.

- Whereas study published by Qaseem et al.[1] say that older age may be associated with higher antibody level.

- Study published by Scourfield et al.[2] says that IgG antibodies are higher in females as compared to male.

1.Qaseem A, Yost J, Etxeandia-ikobaltzeta I et al, What is the antibody response and role in conferring natural immunity after SARS-CoV-2 infection? Rapid, living practice points from the American College of Physicians (Version 1). Ann Intern Med. 2022 ;175:556-565.

2. Scourfield DO, Reed SG, Quastel M et al, The role and uses of antibodies in COVID-19 infections: a living review. Oxf Open Immunol. 2021;2

Limitations of Study

- Long term data beyond 6 months and data on children on antibody response is lacking
- People who had passive immunization by the way of vaccination or patients who have severe COVID and received convalescent plasma
- Was Severe COVID associated with higher antibody response is another area which need to be studied

Carry Home Message

- Understanding the immune response to COVID virus is of paramount importance and limited data was available at the time when study was conceived
- Studying the antibody response to natural COVID infection can help in aiding vaccination design and also long term immunity prospective
- Antibody response was used as one of the parameter for prerequisite for convalescent plasma
- Seroprevalence was one of the ways to check for herd immunity
- Seroconversion in our study was recorded in 96 % on Day 10 and 100 % on day 30

THANK YOU