

**Nancy L. Ren**

L2

LSU Health Sciences Center, New Orleans, LA

Michael E. Hagensee, MD, PHD

LSUHSC, Professor of Medicine - Department of Medicine and Microbiology

### **“IgG Serum Antibody Responses against SARS-CoV-2 in Patients and Healthcare Workers”**

**Background:** The US and the world are in the midst of a pandemic caused by the novel coronavirus severe acute respiratory syndrome coronavirus 2 (SARS- COV-2, clinical syndrome called COVID-19). This virus spreads through respiratory transmission and appears to be quite infectious with an  $R_0$  of approximately 3.0. At present, there is limited data on serum antibody presence and responses from patients who have had COVID-19. Currently, most serological tests for SARS-CoV-2 provide a Yes/No response rather than a serum titer (quantity) response. Serological testing has the potential to ascertain answers to many critical questions regarding antibody protection from reinfection over time. The goal of this study is to determine the serum antibody responses to SARS-CoV-2 from patients and health care workers (HCW) who have had the virus or have potentially been exposed to the virus.

**Methods:** We obtained 125 patients' and HCW's blood samples (46% male, 54% female, 74% white, 17% African American, 6% Asian, 5% other, average age 46, 9% Hispanic). 32 had confirmed positive RNA COVID-19 tests, 17 were self-reported positives, and 76 were healthcare workers. All subjects were tested for IgG seropositivity against the SARS-CoV-2 surface spike protein receptor binding domain (RBD) as well as the internal nucleoprotein (NP) via ELISA. We then measured the magnitude of the seropositive responses with end-point dilution (EPD) titers against both RBD and NP.

**Results:** Overall, there were 30% seropositive (Pos.), 16% intermediate (Int.), and 54% seronegative (Neg.) against RBD. Against NP, there were 26% Pos., 14% Int., and 55% Neg. For patients with a confirmed positive test, 84% were RBD Pos. and 78% were NP Pos. with an average EPD titer of 1:622 and 1:1774, respectively. For patients who self-reported as positive, 47% were RBD Pos. and 35% were NP Pos. with an average EPD titer of 1:1154 and 1:6400, respectively. Among the HCW, 4% were RBD Pos. and 3% were NP Pos. with an average EPD titer of 1:1097 and 1:1280, respectively. There were 26 subjects with discordant results mostly in the Int. category with only 1 RBD Pos. and NP Neg. and 1 RBD Neg. and NP Pos.

**Discussion:** Our data shows high rates of seropositivity in those with documented COVID-19 infection. HCW had a relatively low rates of seropositivity but in the range of other studies including a rate of 5% in the Ochsner Medical System in the New Orleans area. Seropositivity to RBD was greater than NP across all three groups, but this was not statistically significant. All three groups were statistically different for % RBD seropositivity ( $p < 0.001$ ). The true discordant rates were small although there were a number of intermediate results that may reflect cross-reactivity to other genetically related coronaviruses. This will be tested in the future using RBD and NP from these other viruses. In those who were seropositive, there was no significant differences seen in the titers generated. In the future, this study will follow these subjects over time to see how their antibody responses change. We will also analyze how their seropositivity to both RBD and NP relate to the subjects' clinical conditions.