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Comparison of the Antibody Response to COVID-19 Wild-type and its Variants in Naturally Infected versus Vaccinated Individuals

Background Importance: As the SARS-CoV-2 virus evolves, COVID-19 has led to an estimated total of 18 million; 1 in 4.0 reported infections. 12.3% of those infections have been symptomatic in ages 65+ in correlation to 51.3% in ages 18-49. The transmissibility of the severe disease intensifies death rates and as a result, there were a total of 700,882 in ages 65+. In addition to those deaths, there were 60,355 in ages 18-49; about 1 in 3.2 reported deaths worldwide. Viruses like SARS-CoV-2 have genetically mutated and generated multiple lineages of variants. There are twelve variants, including Omicron and Delta. Wuhan strains offer protection against emerging variants, unlike natural infection or vaccination. The current study utilizes a serum bank from those naturally infected with COVID-19 and a group of those vaccinated against the wild-type COVID-19 strains. These serums were compared with high contagions; Delta, mild contagions; Omicron, and subvariant BA.2 levels against a receptor binding domain (RBD) to determine whether the level was increased or decreased.

Hypothesis: Increasing responses of Delta variant are responsible for the induction of SARS-CoV-2 (Covid-19 virus). Antibody responses will be stronger against wild type as compared to the variant. Antibody responses will be stronger in those vaccinated as compared to natural infection.

Objective: To justify whether viral strains can regulate responses of Delta, Omicron, and Wuhan variants. Antibody responses will dictate the effect transmissible variants have on contrasting age groups.

Methods: Using purified RBD from the Wuhan, Delta, Omicron, and Omicron variants the average antibody response to the following proteins were compared. The determined endpoint of dilution titers against the Wuhan COVID-19 strain in 12 individuals who were naturally infected and 12 who were vaccinated were compared to Delta, Omicron and the Omicron variant.

Results: Overall, 24 subjects were included in the study. For the Wuhan and Delta strains, end point dilution titers have been achieved. For Omicron and Omicron variant strains, the titers are to be established. Naturally, infected individuals will be compared to those vaccinated and data will express demographic variables.

Discussion: The determination of the immune response capacity to COVID-19 will assist in determining whether individuals are protected from new strains of SARS-CoV-2 being developed.