

**RT-PCR-negative COVID-19**

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**Abstract.**

Background: COVID-19 is a multi-system infection with emerging evidence-based antiviral and anti-inflammatory therapies to improve disease prognosis. However, a subset of patients with COVID-19 signs and symptoms have repeatedly negative RT-PCR tests, leading to treatment hesitancy. Methods: Between the months of April and October 2020, we conducted serologic testing of patients with i. Signs and symptoms suspicious of COVID-19 who were repeatedly negative by RT-PCR ('Probables') (N=20), ii. Signs and symptoms of COVID-19 but with a potential alternative diagnosis (Suspects) (N=15), iii. No signs and symptoms of COVID-19 ('Non-suspects') (N=43), and iv. RT-PCR confirmed COVID patients (N=40). Results: Probables had similar seropositivity and levels of IgG and IgM antibodies as propensity-score matched RT-PCR confirmed COVID-19 patients (60.0% vs 80.0% for IgG and 50.0% vs 72.5% for IgM), but multi-fold higher seropositivity rates than matched Non-suspects(60.0% vs 11.1% for IgG and 50% vs 4.4% for IgM), which was no different than Suspects who had an alternative diagnosis. However, Probables were half as likely to receive COVID-19 treatment as RT-PCR confirmed COVID-19 patients. Conclusions: Findings from this study confirms a high probability of acute COVID among RT-PCR negative with typical signs/symptoms and no alternative diagnosis, but a common omission of COVID therapies among these patients with severe disease.