Use of PDT therapy for symptom reduction in patients who are or have had COVID-19

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Introduction

The pandemic spread of the novel coronavirus disease (COVID-19), caused by the SARS-CoV-2 virus, is a global health threat. After 15 months of the appearance of the first case in China, more than 674,229,072 people were diagnosed with COVID-19 with approximately 6,864,006 deaths. Light-based technologies emerge in this scenario as concrete options to combat COVID-19. Currently, photodynamic therapy (PDT) has been successfully used in infectious diseases for microbial inactivation, including viruses (4-7). PDT makes use of an endogenous or exogenous photosensitizer (PS), oxygen and light irradiation at the site to be treated. When the FS absorbs light, it goes into an excited state. Upon returning to the ground state, the PS can pass through its triplet state, reacting with the substrate (type I reaction) or with molecular oxygen (type II reaction).

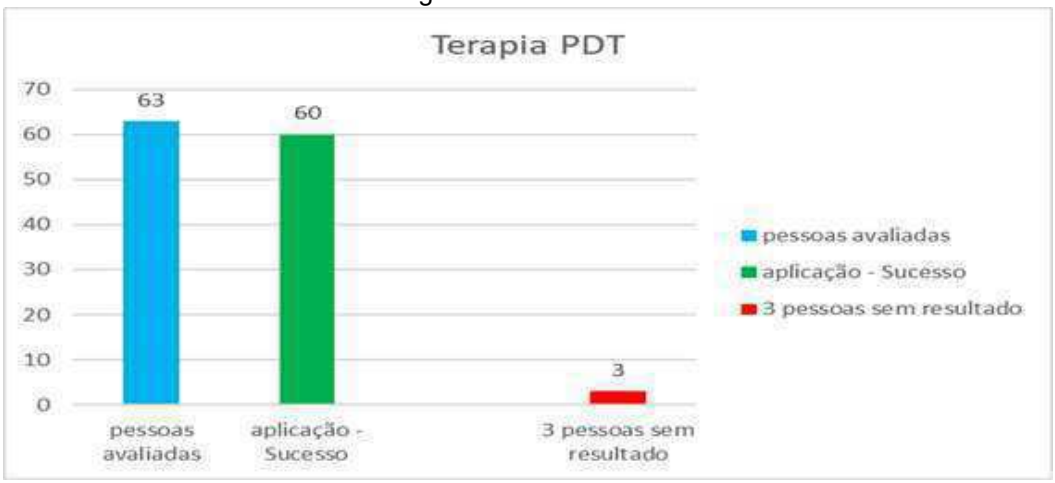
Materials and Methods

We selected 63 patients who agreed to participate in the therapy and were evaluated to verify data related to their health history and tests related to COVID-19, such as imaging tests and history of symptom progression. For the PDT group, we used a 100 μM aqueous AM solution (Sigma-Aldrich) prepared from a 1mM stock solution. MB was applied in the oral cavity with the aid of an irrigation syringe (5 ml) and the patient received 5 ml of the solution, gargling for 5 minutes. After that, we performed the irradiation with LED equipment emitting at λ = 660 nm and power of 100mW for 5 min, following the protocol presented by Schikora et al. (38). This procedure resulted in the delivery of 24 J of energy into the oral cavity. The nasal cavity was irradiated in two stages, one in the right nostril and another in the left, totaling 5 min per nostril.

Results and Discussion

Therapy success percentage (reduction of covid-19 symptoms and treatment of sequelae): 95.23%. Fig 1.

Figure 1. Results PDT



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Conclusions

The therapy applied in the research allowed significant improvements in the symptoms of patients with covid-19, non-invasiveness and speed of recovery were important points observed in the therapy.

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References

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