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PHARMACOTHERAPY FOR COVID-19: COMPARATIVE EFFICACY ANALYSIS BASED ON LITERATURE REVIEW

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BACKGROUND

Pharmacotherapy for COVID-19 patients is still a great challenge for the world healthcare systems. Though a variety of antivirals and antibacterials were used, only a few of them resulted in outcomes improvement. The list of FDA approved drugs against COVID-19 includes Azithromycin, Doxycycline, Remdesivir, Dexamethasone and Methylprednisolone, Hydroxychloroquine, Favipiravir, Tocilizumab, so we performed a review of available results of published randomized clinical trials to make comparative analysis of efficacy of drugs.

Purpose:

To conduct comparative evaluation of efficacy and safety of FDA-approved agents to treat COVID-19 based on the review of available published data.

Materials and Methods: The review of the data of clinical trials from published articles dedicated to the FDA approved drugs for treatment of COVID-19: Azithromycin, Doxycycline, Remdesivir, Dexamethasone and Methylprednisolone, Hydroxychloroquine, Favipiravir, Tocilizumab

RESULTS

The final report on Remdesivir (Beiges et al, 2020) revealed that 200 mg loading dose followed by 100 mg for next 9 days by 541 patients out of 1062 showed recovery rate within 10 days compared with Favipiravir at dose 1600 mg followed by 600 mg for next days in 48 patients out of 96 patients, showed the mean duration of hospital stay at 13.29 ± 5.86 days (results of multi-center randomized trial, Dabbous HM et al, 2021). Hydroxychloroquine observational research in 2021 with 97 patients showed hospitalization/mortality ratio compared with placebo 21.6% vs 31.4%, compared with the results of the RECOVERY trial (1542 patients) showed mortality ratio vs placebo as 25.7% vs 23.5%. PRINCIPLE trial: 80% of azithromycin group revealed recovery in 28 days compared

with 77% in usual care group. Ivermectin plus doxycycline in 200 patients showed recovery rate within 12 days for 77% compared with 62.8% in placebo group (clinical trial NCT04523831). Drugs used against acute respiratory distress syndrome (ARDS) showed results as follows, methylprednisolone resulted in composite primary end-point (admission to ICU, need for invasive mechanical ventilation, or all-cause death by day 28) as 22.9% compared with 44.4% in non-methylprednisolone group (clinical trial NCT04323592). RECOVERY trial data on mortality with dexamethasone compared with no exposure patients resulted in 29.3% vs 41.4%. Tocilizumab showed mortality rate 7% compared with 20% in the standard care group (Guaraldi G et al, 2020).

CONCLUSIONS

Remdesivir and favipiravir had promising results, though not high rates of efficacy. Hydroxychloroquine did not affect the hospital stay. For treatment and prophylaxis of serious conditions such as bacterial superinfection, azithromycin resulted in light improvement, and doxycycline showed efficacy which is used in less risk groups as there is antimicrobial resistance against azithromycin. ARDS can be treated efficiently by dexamethasone during mechanical ventilation. Cytokine storm can be treated efficiently by tocilizumab.

Keywords:

COVID-19, Azithromycin, Doxycycline, Remdesivir, Dexamethasone, Methylprednisolone, Hydroxychloroquine, Favipiravir, Tocilizumab