Benefit-risk assessment for remdesivir in COVID-19

There may be a favourable benefit-risk profile for remdesivir in the treatment of COVID-19, according to results reported in *Drug Safety*, although additional safety data "should be obtained in further studies".

The Benefit-Risk Action Team (BRAT) framework was used to assess the overall benefit-risk of remdesivir compared with standard of care, placebo, or other treatments. A search of PubMed, Google Scholar and government agency websites was performed to identify patients with severe COVID-19 who were hospitalised as a result of the infection.

In a value tree using key endpoints from clinical trial protocols, the highest ranked factor according to perceived clinical significance was death, followed by ICU admission, non-invasive ventilation/high flow oxygen, other clinical outcomes, oxygen, and viral load parameters.

As remdesivir is not approved for any indication, complete characterisation of its safety profile has not occurred. However, a value tree using available safety data revealed that the highest ranked factor according to perceived clinical significance was cardiovascular events, followed by multiple organ dysfunction syndrome/septic shock, respiratory failure/acute respiratory distress syndrome, immune reactions, venous thromboembolism, renal events, liver events, gastrointestinal events and thrombocytopenia.

Due to data paucity, a fully quantitative assessment was not undertaken. However, the benefit of time to recovery was significantly shorter in remdesivir versus placebo recipients (11 vs 15 days; $p<0.001$). There were non-significant differences in mortality (8% vs 12%), time to clinical improvement (21 vs 23 days), invasive ventilation (1% vs 4%) and oxygen use at day 28 (12% vs 17%). The serious adverse event rate was lower in remdesivir recipients (18% vs 26%), but the rate of drug withdrawal due to an adverse event was higher (12% vs 5%).

"Preliminary clinical trial results suggest that there may be a favourable benefit-risk profile for remdesivir compared with placebo in severe COVID-19 infection", note the authors, "and further data on benefits would strengthen this evaluation".

Davies M, et al. Remdesivir in Treatment of COVID-19: A Systematic Benefit-Risk Assessment. . Drug Safety : 1-12, 28 May 2020. Available from: URL: http://doi.org/10.1007/s40264-020-00952-1

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