

Non-steroidal anti-inflammatory drug use in COVID-19



Early in the COVID-19 pandemic, there was concern in the media that the use of non-steroidal anti-inflammatory drugs (NSAIDs), particularly ibuprofen, might exacerbate COVID-19 symptoms. These concerns, based on unpublished data, led to advice against the use of NSAIDs.¹ Given the widespread general use of NSAIDs, this debate spurred multiple studies to refute or confirm a possible association. The mechanism through which NSAIDs could theoretically be of harm in patients with COVID-19 is by upregulation of angiotensin-converting enzyme 2 (ACE2) receptors in the lungs, arteries, heart, kidney, and intestines,² which is used by SARS-CoV-2 as an entry point into cells. Additionally, NSAIDs might delay diagnosis of COVID-19 by masking inflammation and fever. After several initial studies, WHO, the European Medicines Agency (EMA), and the US Food and Drug Administration (FDA) did not advocate against ibuprofen use for COVID-19, but they continue to recommend careful monitoring given the theoretical risk. In *The Lancet Rheumatology*, Thomas Drake and colleagues³ try to settle the uncertainty.

Drake and colleagues³ used data from the ISARIC Clinical Characterisation Protocol UK cohort, allowing access to a large number of patients admitted to hospital with COVID-19 (n=72 179; 40 406 [56.2%] of 71 915 were men, 31 509 [43.8%] were women) from 255 UK health-care facilities (representing around 60% of all patients admitted to hospital with COVID-19 in the UK in the study period from Jan 17 to August 10, 2020). The authors analysed the association between NSAID exposure and severe COVID-19 outcomes, including mortality, critical care admission, need for invasive ventilation, need for oxygen, and acute kidney injury. None of these outcomes were significantly associated with NSAID exposure in the 2 weeks before hospital admission. The distribution of previous NSAID use was similar in those who died compared with those who survived, indicating that the association of NSAID use with non-mortality outcomes, including critical care admission and treatments, were not affected by excess mortality in any exposure group. An important subanalysis of the type of NSAID used also did not indicate any increased risk of mortality in patients taking ibuprofen compared with those not taking any NSAIDs (matched OR 0.90, 95% CI 0.71–1.13; p=0.36) or those

taking other NSAIDs (matched OR 0.82, 0.66–1.03; p=0.082). As in other similar studies, the authors were unable to provide data on the effect of whether NSAIDs were continued or discontinued during hospital stay. Data on dosages and treatment duration were also not available. Consequently, it is unclear whether a potential harmful effect of NSAIDs is masked by discontinuation during hospital stay, low dosages, or short treatment duration. This study also did not provide any insight into whether comparator drugs (ie, paracetamol) were better, equal, or worse in terms of COVID-19 outcomes. This issue, as well as the effects of taking NSAIDs on acquiring SARS-CoV-2 in the community, has been studied in patients with osteoarthritis; patients were treated with co-codamol (paracetamol and codeine) or co-dydramol (paracetamol and dihydrocodeine) as alternatives to NSAIDs.⁴ In support of the current study findings, no indication of harm caused by NSAIDs were seen in this previous study.⁴ Another study also confirmed no increased risk of poorer COVID-19 outcomes for NSAID users compared with paracetamol use or no antipyretic drug use.⁵ In a subgroup analysis in this smaller study of 403 patients with COVID-19, antipyretic drug use throughout the disease period was reported in 134 patients, of whom 85 were treated with paracetamol and 49 with ibuprofen, and no differential risk of poorer outcomes was apparent for either of the two treatment groups.

In conclusion, NSAID use with COVID-19 appears to confer no increased risk of poorer outcomes. This idea is supported by a growing body of evidence, of which the majority points towards the same conclusion.⁴⁻⁹ Details regarding use of NSAIDs, including the effects of continuation or discontinuation after hospital admission, dosage, and treatment duration, deserve attention in future studies. The clinical statements from the WHO, EMA, and FDA of lack of harmful effects of NSAID use in COVID-19 infection are supported by the current study. The current study complements several previous observational studies, of which most have supported the lack of association between NSAID use and COVID-19 severity. Ultimately, based on current knowledge, clinicians should not refrain from or discontinue NSAIDs in patients with COVID-19 if NSAID treatment is indicated.



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