Title
Reply to Corticosteroid-Induced Osteonecrosis in COVID-19: A Call for Caution

Journal
Journal of Bone and Mineral Research, 35(10)

ISSN
0884-0431

Authors
Yu, Elaine W
Tsourdi, Elena
Clarke, Bart L
et al.

Publication Date
2020-10-01

DOI
10.1002/jbmr.4144

Peer reviewed

JBMR®

Reply to Corticosteroid-Induced Osteonecrosis in COVID-19: A Call for Caution

Elaine W Yu,[1] Elena Tsourdi,[2,3] Bart L Clarke,[4] Douglas C Bauer,[5,6] and Matthew T Drake[4,7]

[1]Endocrine Unit, Massachusetts General Hospital/Harvard Medical School, Boston, MA, USA
[2]Department of Medicine III, Universitätsklinikum Dresden, Dresden, Germany
[3]Center for Healthy Aging, Universitätsklinikum Dresden, Dresden, Germany
[4]Division of Endocrinology, Diabetes, Metabolism, and Nutrition, Mayo Clinic, Rochester, MN, USA
[5]Department of Medicine, University of California, San Francisco, San Francisco, CA, USA
[6]Department of Epidemiology and Biostatistics, University of California, San Francisco, San Francisco, CA, USA
[7]Robert and Arlene Kogod Center on Aging, Mayo Clinic, Rochester, MN, USA

To the Editor

We appreciate the thoughtful letter from Zhang and Zhang regarding our recently published Perspective on management recommendations in patients with osteoporosis during the ongoing COVID-19 pandemic.[1] As noted by Zhang and Zhang, the recommendations included in our article were focused on patients who had been either previously diagnosed with osteoporosis or those who had received a diagnosis of osteoporosis during the current pandemic. Accordingly, our goals in providing these recommendations were to be broadly inclusive but also sufficiently brief so as to provide clear and concise guidance in the setting of unparalleled challenges to the provision of optimal health care for these vulnerable patients.

As noted by Zhang and Zhang, osteonecrosis of the femoral head is a well-recognized complication of treatment with supraphysiologic doses of glucocorticoids. As recently published in preprint format for the Randomized Evaluation of COVID-19 therapy (RECOVERY) trial,[2] there is now growing evidence suggesting that daily treatment for up to 10 days with 6 mg of dexamethasone reduces 28-day mortality in comparison to usual care alone, a finding that was most evident in subjects receiving mechanical ventilatory support at the time of randomization. In response to this report, the World Health Organization called for increasing worldwide dexamethasone supplies,[3] and dexamethasone treatment was quickly introduced into clinical practice.[4] Given these initial promising results and the ongoing worldwide pandemic, it is likely that dexamethasone (or treatment with other high-dose glucocorticoids) will continue to play an integral role in therapeutic efforts for the treatment of COVID-19.

In light of the relationship between supraphysiologic glucocorticoid dosing and adverse bone effects including osteonecrosis of the femoral head, we are supportive of alerting providers and patients to the potential for unintended skeletal impacts of the glucocorticoid therapy. Although femoral head osteonecrosis was frequently observed among patients with severe acute respiratory syndrome (SARS) who were treated with high-dose glucocorticoids in 2003,[5] the cumulative dose and duration were significantly higher than the glucocorticoid doses currently being recommended for COVID-19 therapy. To our knowledge and based on review of the literature, there also appears to be very little data showing that the prospective use of skeletal active agents (such as bisphosphonates) lessen the risk for the development of femoral head osteonecrosis in the setting of time-limited high-dose glucocorticoid therapy. Further, given that such glucocorticoid therapy may be life-sustaining, we would urge caution regarding potentially either not treating or alternatively withdrawing treatment early in critically ill patients with COVID-19 who might otherwise benefit from such therapy. Thus, while we are supportive of the future development of a risk stratification approach for osteonecrosis of the femoral head related to supraphysiologic glucocorticoid dosing provided during the course of COVID-19 treatment, we would recommend the collection of additional data, ideally obtained across multiple countries, before strict criteria for risk categorization are widely implemented. Finally, we fully agree that clinicians who care for COVID-19 patients who have received high-dose glucocorticoids should be aware of potential skeletal complications with such therapy and should evaluate those patients with suspected avascular necrosis of the hip with magnetic resonance imaging.[6]

References

1. Yu E, Tsourdi E, Clarke BL, Bauer DC, Drake MT. Osteoporosis management in the era of Covid-19. J Bone Miner Res. 2020;35(6):1009–13.
2. RECOVERY Collaborative Group. Effect of dexamethasone in hospitalized patients with COVID-19—preliminary report. Epub 2020 June 22. Available at: https://www.medrxiv.org/content/10.1101/2020.06.22.20137273v1.full.pdf.

Received in original form July 16, 2020; accepted July 23, 2020.
Address correspondence to: drake.matthew@mayo.edu
Journal of Bone and Mineral Research, Vol. 00, No. 00, Month 2020, pp 1–2.
DOI: 10.1002/jbmr.4144

3. World Health Organization. WHO Director-General's opening remarks at the media briefing on COVID-19–22 June 2020. Available at: https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---22-june-2020.
4. Mahase E. Covid-19: low dose steroid cuts death in ventilated patients by one third, trial finds. BMJ. 2020;369:m2422.
5. Zhao R, Wang H, Feng F. Steroid therapy and the risk of osteonecrosis in SARS patients: a dose-response meta-analysis. Osteoporos Int. 2017; 28(3):1027–34.
6. Li J, Wang J, Zhao J, et al. BOLD-MRI early detect femoral head osteonecrosis following steroid-treated patients. Medicine. 2017;96(44): e8401.