Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Contents lists available at ScienceDirect

Diabetes & Metabolic Syndrome: Clinical Research & Reviews

journal homepage: www.elsevier.com/locate/dsx

Letter to the editor in response to the article: “Is diabetes mellitus associated with mortality and severity of COVID-19? A meta-analysis (Kumar et al.)”

Dear Editor,

We read the article by Kumar et al. titled “Is diabetes mellitus associated with mortality and severity of COVID-19? A meta-analysis” <https://doi.org/10.1016/j.dsx.2020.04.044> published on May 6, 2020 in this journal with a great interest [1]. We felt that authors have put more emphasis on strength of this analysis rather than the limitation. This meta-analysis has a lot more limitations than any strength, which should have been acknowledged by the authors.

We have noted following limitations to this meta-analysis, which needs kind attention of authors to interpret it properly.

- 1 Authors' have calculated the odds ratio of severity and mortality in patients with diabetes and COVID-19. However, to assess the relative risk of severity and mortality, risk ratio or hazard ratio should have been calculated, rather than the odds ratio.
- 2 Authors have enthusiastically included 33 studies in Table 1 [1] without seriously looking for the overlap. Repeat inclusion of same data will give erroneous results rather than the real. For example- Same one/two centers of Wuhan, China, with the same/different first author name, with data collected during same time period, have been reported in 17 studies out of 33 studies included in this meta-analysis. Moreover, the largest China-wide study reported by Guan et al. included in this metaanalysis may have included the data reported from several smaller hospital-based studies including these 17 studies. Similarly, data of Goyal et al. from USA and CDC, USA have overlapped data. We wonder how the authors have overlooked this issue while conducting this meta-analysis and not excluded these studies to avoid overlapping data, that can lead to a wrong conclusion.
- 3 Authors have concluded that “Diabetes in patients with COVID-19 is associated with a two-fold increase in mortality as well as severity of COVID-19, as compared to non-diabetics”. This is a factually incorrect statement. Authors need to realize that they

have calculated the odds ratio of severity and mortality while comparing the diabetic patients who required mechanical ventilation or ICU admission or died versus the diabetic patient who did not. This meta-analysis did not calculate the risk of severity or mortality between patients with diabetes versus non-diabetic cohort. Therefore, the conclusion of this meta-analysis should be that “patients who have severe COVID-19, or who die from the disease, are more likely to have diabetes”, rather than diabetic patients had more severe Covid-19 and more likely to succumb to death. This needs to be clarified. There are number of meta-analysis now available that have done similar kind of analysis and compared severity and mortality in diabetic patients to another diabetic patient with less severe COVID-19 or having survived [2–6]. Authors have overlooked citing these articles. Unfortunately, none of these meta-analyses published so far including the Kumar et al. have compared the severity and fatality in diabetic vs. non-diabetic cohort with COVID-19. References: (1–6)

Declaration of competing interest

We hereby declare that we have no conflict of interest, related to this document.

References

- [1] Kumar A, Arora A, Sharma O, et al. Is diabetes mellitus associated with mortality and severity of COVID-19? A metaanalysis. *Diabetes Metabolic Syndrome: Research and Review*. <https://doi.org/10.1016/j.dsx.2020.04.044>.
- [2] Emami A, Javanmardi F, Pirbonyeh N, Akbari A. Prevalence of Underlying Diseases in Hospitalized Patients with COVID-19: a Systematic Review and Meta-Analysis. *Arch Acad Emerg Med* 2020;8(1):e35.
- [3] Yang J, Zheng Y, Gou X, et al. Prevalence of comorbidities in the novel Wuhan coronavirus (COVID-19) infection: a systematic review and meta-analysis. *Int J Infect Dis* 2020.
- [4] Li B, Yang J, Zhao F, et al. Prevalence and impact of cardiovascular metabolic diseases on COVID-19 in China. *Clin Res Cardiol* 2020.

- [5] Jain V, Yuan JM. Systematic review and meta-analysis of predictive symptoms and comorbidities for severe COVID-19 infection. medRxiv 2020. Pre-print.
- [6] Chen YM, Gong X, Wang L, Guo J. Effects of hypertension, diabetes and coronary heart disease on COVID-19 diseases severity: a systematic review and meta-analysis. medRxiv 2020. Pre-print.

Awadhesh Kumar Singh*, Ritu Singh

* Corresponding author. Senior Consultant Endocrinologist, GD Hospital and Diabetes Institute Kolkata, 700013, West Bengal, India, Ph: 919831020428.

E-mail address: drawadheshkumarsingh@gmail.com (A. Kumar Singh).