Letter to the Editor

Drinking no-links to the severity of COVID-19: a systematic review and meta-analysis

Dear Editor,

We read with interest a study published in your journal. Zhao-hai Zheng and colleagues through a systematic review of clinical trials found that smoking was risk factors for disease progression in patients with COVID-19.[1] However, there is no study to show whether the severity of (Coronavirus disease 2019) COVID-19 is related to drinking. Only some studies have shown that no substantial difference was observed in the habits of drinking between severe and non-severe COVID-19 patients.[2,3] But these studies drew conclusions only based on the cohort study which the sample size is limited. The aim of this study is getting a more convincing conclusion by a systematic review and meta analysis to quantitatively assess whether drinking is associated with the severity of COVID-19.

In this study, patients with acute respiratory distress syndrome (ARDS) who requires life support, mechanical ventilation, or intensive care unit (ICU) support are considered as severe patients.[4] Due to the use of public anonymous data, this work does not require ethical approval. Studies that meet the following criteria were included: (1) patients have a laboratory confirmed diagnosis of COVID-19; (2) provided data of severe or no-severe between patients with drinking and non-drinking; (3) published in Chinese and English, no restricted on publication date. Case reports, studies with a sample size of no more than 10 patients, review articles, and conference abstracts were excluded. We only focused on the outcomes of the incidence of severe or non-severe COVID-19 disease between drinking and non-drinking patients.

We searched the following databases up to May 8, 2020 without language limitations: PubMed, EMBASE.com, Web of Science, the Cochrane Central Register of Controlled Trials (CENTRAL), China National Knowledge Infrastructure (CNKI), Chinese Biomedical Literature Database (CBM), and Wanfang. Various combinations and permutations of the following search terms "coronavirus", "COVID-19", "SARS-COV-2", "2019-nCOV", "drinking" and "alcohol consumption" were used. We also searched the reference lists of eligible studies and relevant systematic reviews to find eligible studies.

Two reviewers independently conducted study selection and data extraction. Any disagreement among authors about study selection and data collection was investigated by supervising authors. The following data were collected: name of the first author, journal title, publication date, location of the study, publication language, recruitment time frame, sample size, age and sex of patients, and outcomes of interest.

Data analyses were performed using Review Manager 5.3 (Nordic Cochrane Centre, Copenhagen, Denmark). The risk ratio (RR) and the corresponding 95% confidence interval (CI) were the principal measures. We used the chi-square test together with the I^2 statistic to assess the heterogeneity, considering $I^2 \geq 50\%$ indicative of considerable heterogeneity. If heterogeneity exists, the random effects model was used; if not, the fixed effects model was used. In addition, we also conducted sensitivity analysis by excluding studies published in Chinese to assess the stability of the results.

A total of 2472 were retrieved from the electronic database. After sequentially screening through the titles/abstracts and the full texts, six studies met the inclusion criteria and were pooled into a meta-analysis. All studies were conducted in China. One study published in Chinese,[6] five studies published in English.[2,3,5,7,8] All studies incorporated a total of 1998 patients (1053 males) between December 18, 2019 and February 24, 2020. The sample size of patients per study ranged from 202 to 476 (Table 1).

The pooled RR of these studies is summarized in Fig. 1, which shows that the drinking did not impact the severity of COVID-19 (RR: 1.09, 95%CI: 0.79-1.49, P=0.600, I^2=56%). We explored the source of heterogeneity by excluding each study sequentially. When we excluded the study published by Feng Y et al.,[2] the pooled RR of other studies was 0.93 (95%CI: 0.79-1.09, P=0.38) and I^2 was 0. It shows that the heterogeneity may come from this study.[2] In addition, sensitivity analysis indicated the result (RR: 1.09, 95%CI: 0.78-1.53) did not change substantially after excluding the Chinese study.

Currently, there are two diametrically opposed views on whether alcohol consumption will increase during the COVID-19 pandemic: (1) increase in consumption for some populations, particularly men, due to distress experienced as a result of the pandemic; (2) a lowered level of consumption, based on the decreased physical and financial availability of alcohol.[9] Therefore, it is meaningful to explore whether the severity of COVID-19 related to drinking. It can guide people's lifestyle during the epidemic. Our study showed that drinking is not related to the severity of COVID-19. However, this study did not consider the volume and time of drinking. In future, researcher should pay attention to whether drinking volume and time are related to the increase of covid-19. In addition, researcher can focus more on changing other lifestyles, such as smoking.[10]

However, this study was limited by small sample size and the study location (all in China). If more data is published, this study should be re-analyzed to provide more reliable evidence.

Declaration of Competing Interest

The authors declare that they have no competing interests.

Table 1
Characteristics of included studies.

Study	Country	Language	Recruitment time frame	Sample	Age. (years)[a]	Sex		Drinking		Non-drinking	
						Male	Female	Severe	Non-severe	Severe	Non-severe
Ji D[5]	China	English	2020.01.20-2020.02.18	202	44.5(34.8-54.1)	113	89	1	6	38	196
Feng Y[2]	China	English	2020.01.01-2020.02.15	476	53(40-64)	271	205	17	747	107	439
Qian ZP[6]	China	Chinese	2020.01.20-2020.02.24	324	51(36,64)	167	157	2	491	24	299
Yu X[7]	China	English	2019.12.18-2020.02.19	333	50(35-63)	172	161	5	505	21	252
Hu L[3]	China	English	2020.01.08-2020.02.20	323	61(23-91)	166	157	18	489	154	287
Wang K[8]	China	English	2020.01.01-2020.02.20	340	NR	164	176	17	504	290	320

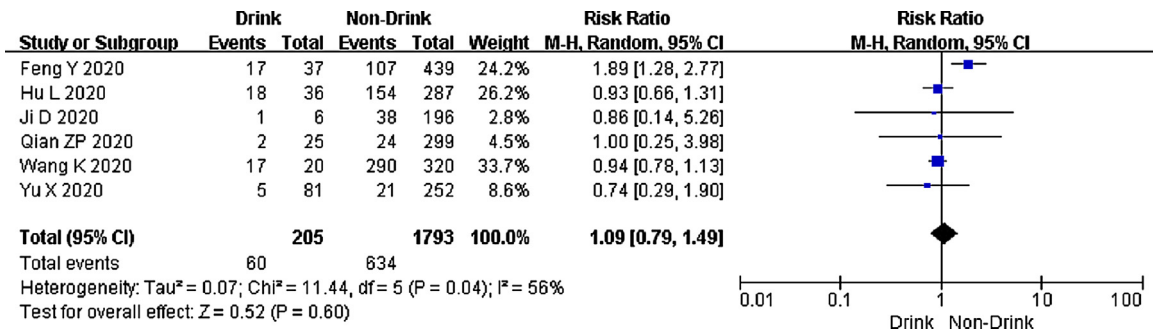[a] Age data presented as median (IQR) or mean (SD). NR, not reported.

Fig. 1. Forest plot of the meta-analysis of the impact of drinking to COVID-19.

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