

Incidence, clinical characteristics and prognostic factor of patients with COVID-19: a systematic review and meta-analysis

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Abstract

Background: Recently, Coronavirus Disease 2019 (COVID-19) outbreak started in Wuhan, China. Although the clinical features of COVID-19 have been reported previously, data regarding the risk factors associated with the clinical outcomes are lacking. Objectives: To summary and analyze the clinical characteristics and identify the predictors of disease severity and mortality. Methods: The PubMed, Web of Science Core Collection, Embase, Cochrane and MedRxiv databases were searched through February 25, 2020. Meta-analysis of Observational Studies in Epidemiology (MOOSE) recommendations were followed. We extracted and pooled data using random-effects meta-analysis to summary the clinical feature of the confirmed COVID-19 patients, and further identify risk factors for disease severity and death. Heterogeneity was evaluated using the I² method and explained with subgroup analysis and meta-regression. Results: A total of 30 studies including 53000 patients with COVID-19 were included in this study, the mean age was 49.8 years (95% CI, 47.5-52.2 yrs) and 55.5% were male. The pooled incidence of severity and mortality were 20.2% (95% CI, 15.1-25.2%) and 3.1% (95% CI, 1.9-4.2%), respectively. The predictor for disease severity included old age (≥ 50 yrs, odds ratio [OR] = 2.61; 95% CI, 2.29-2.98), male (OR = 1.348, 95% CI, 1.195-1.521), smoking (OR = 1.734, 95% CI, 1.146-2.626) and any comorbidity (OR = 2.635, 95% CI, 2.098-3.309), especially chronic kidney disease (CKD, OR = 6.017; 95% CI, 2.192-16.514), chronic obstructive pulmonary disease (COPD, OR = 5.323; 95% CI, 2.613-10.847) and cerebrovascular disease (OR = 3.219; 95% CI, 1.486-6.972). In terms of laboratory results, increased lactate dehydrogenase (LDH), C-reactive protein (CRP) and D-dimer and decreased blood platelet and lymphocytes count were highly associated with severe COVID-19 (all for $P < 0.001$). Meanwhile, old age (≥ 60 yrs, RR = 9.45; 95% CI, 8.09-11.04), followed by cardiovascular disease (RR = 6.75; 95% CI, 5.40-8.43) hypertension (RR = 4.48; 95% CI, 3.69-5.45) and diabetes (RR = 4.43; 95% CI, 3.49-5.61) were found to be independent prognostic factors for the COVID-19 related death. Conclusions: To our knowledge, this is the first evidence-based medicine research to explore the risk factors of prognosis in patients with COVID-19, which is helpful to identify early-stage patients with poor prognosis and adapt effective treatment.