







Jacek Smereka<sup>1</sup> , Krzysztof Jerzy Filipiak<sup>2</sup> , Łukasz Szarpak<sup>3</sup> , Ishag Adam<sup>4</sup> , Anna Abelson<sup>5</sup> , Miłosz Jarosław Jaguszewski<sup>6</sup> 

<sup>1</sup>Department of Emergency Medical Service, Wrocław Medical University, Wrocław, Poland

<sup>2</sup>1<sup>st</sup> Department of Cardiology, Medical University of Warsaw, Poland

<sup>3</sup>Comprehensive Cancer Center in Białystok, Białystok, Poland

<sup>4</sup>Department of Obstetrics and Gynecology, Unaizah College of Medicine and Medical Sciences, Qassim University, Unaizah, Saudi Arabia

<sup>5</sup>Department of Health Science, Karlstad University, Karlstad, Sweden

<sup>6</sup>1<sup>st</sup> Department of Cardiology, Medical University of Gdańsk, Gdańsk, Poland

## Arterial hypertension and outcomes of COVID-19 — evidence from meta-analysis

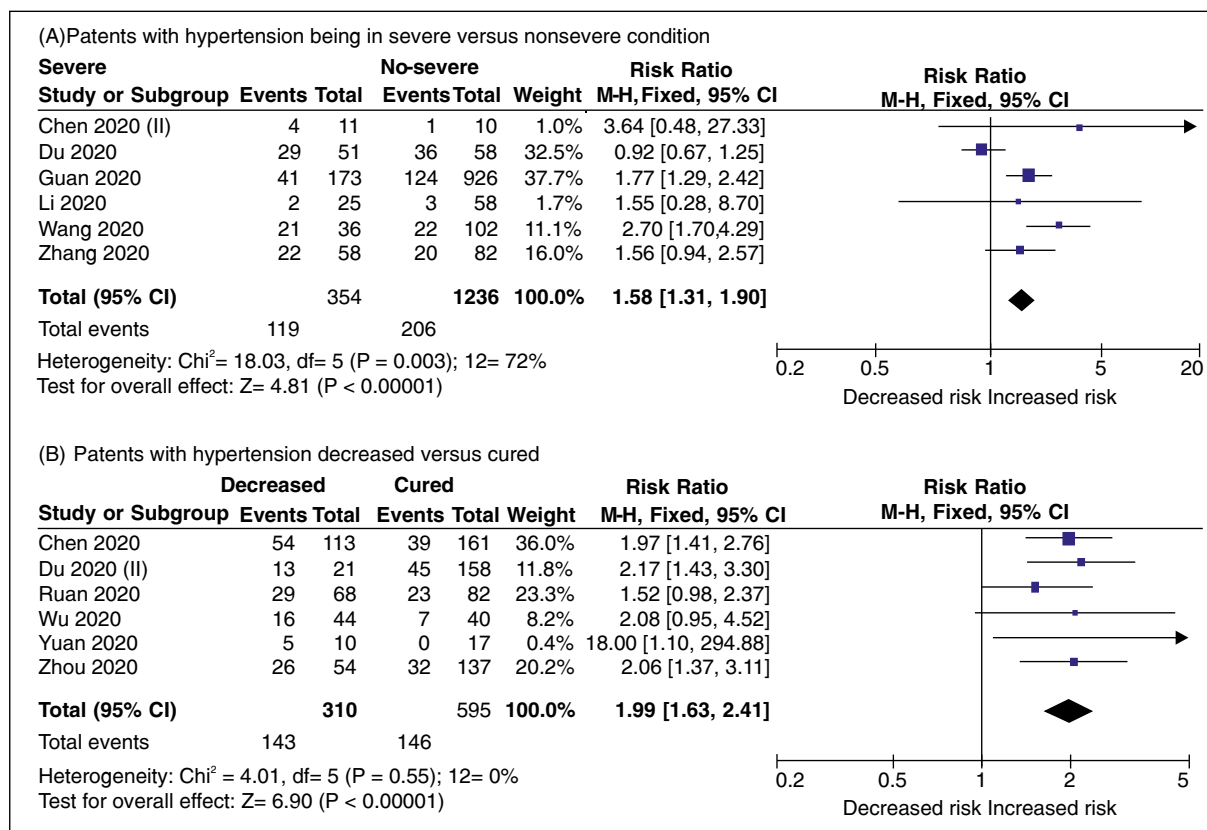
**Dear Sirs,**

Since the very beginning of the COVID-19 era, studies involving over 1000 patients revealed a high percentage of arterial hypertension history in infected patients. One of the first of those included 1099 patients with confirmed COVID-19, of whom 173 had severe disease with comorbidities of hypertension (23.7%), diabetes mellitus (16.2%), coronary heart diseases (5.8%), and cerebrovascular disease (2.3%). There is however no evidence that hypertension is related to outcomes of COVID-19. We, therefore, performed the meta-analysis of retrospective case series to estimate the outcome of COVID-19 patients with/without arterial hypertension history. Data from studies: Guan, et al. (2020) [1], Chen, et al. (2020) [2, 3], Wang, et al. (2020) [4], Zhou, et al. (2020) [5], Ruan, et al. (2020) [6], Du, et al. (2020) [7, 8], Li, et al. (2020) [9], Zhang, et al. (2020) [10], Yuan, et al. (2020) [11], Wu, et al. (2020) [12] were included in the meta-analysis, as the only one is currently available after searching MEDLINE, Scopus and Web of

Science databases up to April 15, 2020. The analysis was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. The meta-analysis showed that patients with preexisting arterial hypertension statistically significantly more often have worse clinical outcomes when infected with SARS-CoV-2 (RR = 1.64; 95% CI, 1.08–2.49;  $p = 0.02$ ) (Fig. 1A). In addition, statistically significant differences were observed in the incidence of hypertension in the group of deceased versus cured (RR = 1.99; 95% CI, 1.63–2.41;  $p < 0.001$ ) (Fig. 1B). This may confirm the hypothesis that arterial hypertension is one of the most important predictors affecting high morbidity and mortality of patients with COVID-19, although still the pathophysiological mechanisms are not fully understood.

### Conflict of interest

The authors declare no conflict of interest.



**Figure 1.** Forest plot of incidence of hypertension in COVID-19 patients; (A) being in severe versus no-severe condition; (B) decreased vs. cured. The center of each square represents the weighted risk ratio for individual trials, and the corresponding horizontal line stands for 95% confidence interval. The diamonds represent pooled results

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