Normal Approaches Post Pandemic COVID-19 in All Aspects of Hypertension and Comorbidities

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Hypertension and Covid 19

What We Know and Don't Know

1. Link between Hypertension and COVID-19

- Since SARS-CoV-2 infects human cells via ACE2 receptor that acts on the RAAS, a key regular of blood pressure, questions have been raised about a possible link between hypertension and severe COVID-19 infection.

2.SARS-CoV-2 and interaction with the Renin-Angiotensin Aldosterone System

- SARS-CoV-2 binds to the ACE2 receptor via its spike (S) protein to allow entry into host cells. This complex is endocytosed leading to down-regulation of ACE2 and resulting in local accumulation of angiotensin II.
- Severe respiratory illness is a hallmark of COVID-19 and a primary cause of morbidity- and mortality-local activation of the RAAS is proposed as a mechanism for severe lung injury.[14]

14.Vaduganathan M, Vardeny O, Michel T, McMurray JJV, Pfeffer MA, Solomon SD. Renin-angiotensin-aldosterone system inhibitors in patients with Covid-19. N Engl J Med 2020;382:1653–9.

3. Impact of RAAS Inhibitors on COVID-19 Patient Outcomes

Some conflicting retrospective study

- 3.1 *Zhejiang Province of China*: *487 COVID-19 patients*,the prevalence of hypertension was higher in the 49 severe cases than in the 438 mild cases **(53.1% vs. 16.7%, *p*<0.0001).** Further multivariable-adjusted analysis revealed that **male sex, age ≥50 years old, and hypertension** were independent factors for COVID-19 severity on admission (odds ratio, 2.71; 95% confidence intervals 1.32–5.59) .(11)
- *3.2 Wuhan, China: 548 inpatients in* the prevalence of hypertension was significantly higher in patients with severe COVID-19 than in non-severe cases **(38.7% vs. 22.2%, p<0.001)**. In a logistic model with adjustment for age, high lactate dehydrogenase (LDH), and D-dimer, hypertension was independently associated with the severity of COVID-19 on admission (odds ratio, 2.01; 95% confidence intervals, 1.27–3.17) [12]. **Male sex, age ≥65 years old, high white blood cell count, LDH, cardiac injury, hyperglycemia, and high dose corticosteroid** were independent predictive factors for death in a multivariable-adjusted Cox proportional hazard model.

Although some studies report that hypertension can be an independent risk factor for severe COVID-19 (11, 12), **it would be plausible to interpret that** the high prevalence of hypertension among patients with severe and fatal COVID-19 **may be attributed to the vulnerability of older individuals** to SARS-CoV-2 infection.

11. Shi Y, Yu X, Zhao H, Wang H, Zhao R, Sheng J. Host susceptibility to severe COVID-19 and establishment of a host risk score: findings of 487 cases outside Wuhan. Crit Care. 2020;24:108. [PMC free article] [PubMed] [Google Scholar]

12. Li X, Xu S, Yu M, Wang K, Tao Y, Zhou Y, et al. Risk factors for severity and mortality in adult COVID-19 inpatients in Wuhan. J Allergy Clin Immunol. 2020 doi: 10.1016/j.jaci.2020.04.006. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

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3.3 French single-center study [13] reported that hypertension was not significantly associated with progression of COVID-19, as defined as the requirement of invasive mechanical ventilation during hospitalization (OR, 2.29; 95% CI, 0.89–5.84; $p=0.08$), even though the association was significant in a univariate model. In these and other studies, hypertension was not selected as an independent factor for COVID-19 severity based on multivariable-adjusted analysis, despite being identified as a risk factor by univariate [4, 12–14] or bivariate [15] survival analysis.

At present, there is no clear epidemiological evidence supporting that hypertension itself is an independent risk factor for developing severe disease in patients with COVID-19. We, therefore, agree with the conclusion of the Centers for Disease Control and Prevention (CDC), which does not include hypertension in the list of risk factors for COVID-19 severity [16].

13. Simonnet A, Chetboun M, Poissy J, Raverdy V, Noulette J, Duhamel A, et al. High prevalence of obesity in severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) requiring invasive mechanical ventilation. Obesity. 2020;28:1195–9. [PMC free article] [PubMed] [Google Scholar]14.Vaduganathan M, Vardeny O, Michel T, McMurray JJV, Pfeffer MA, Solomon SD. Renin-angiotensin-aldosterone system inhibitors in patients with Covid-19. N Engl J Med 2020;382:1653–9.15. Patel AB, Verma A. COVID-19 and angiotensin-converting enzyme inhibitors and angiotensin receptor blockers: what is the evidence? JAMA 2020 March [Epub ahead of print].16. Centers for Disease Control and Prevention. People who are at higher risk for severe illness. https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-at-higher-risk.html. Accessed 25 May 2020.

REVIEW PAPER

COVID-19 and hypertension—evidence and practical management: **Guidance from the HOPE Asia Network**

- There are several risk factors for worse outcomes in patients with COVID-19.
- Patients with hypertension appear to have a poor prognosis, **but there is no direct evidence that hypertension increases the risk of new infection** or adverse outcomes independent of age and other risk factors
- There is **little evidence** that use of RAS inhibitors increases the risk of SARS-CoV-2 virus infection or worsens the course of COVID-19. Therefore, **antihypertensive therapy with these agents should be continued.**
- In addition to acute respiratory distress syndrome, patients with severe COVID-19 can develop **myocardial injury** and **cytokine storm, resulting in heart failure, arteriovenous thrombosis, and kidney injury. Troponin, N-terminal pro-B-type natriuretic peptide, D-dimer, and serum creatinine are biomarkers for these complications** and can be used to monitor patients with COVID-19 and **for risk stratification.**
- Other factors that need to be incorporated into **patient management strategies during the pandemic include regular exercise to maintain good health status and monitoring of psychological well-being.**
- For the ongoing management of patients with hypertension, **telemedicine-based home blood pressure monitoring strategies can facilitate maintenance of good blood pressure control while social distancing is maintained.**
- Overall, **multidisciplinary management of COVID-19** based on a rapidly growing body of evidence will help ensure the best possible outcomes for patients, including those with risk factors such as hypertension.

Conclusion

- *A New Normal is* ***the creation of a sustainable new life-style standard*** *with the challenge of COVID-19* **(Adaptasi Kebiasaan Baru).**
- Towards Indonesia"s New Normal : **Strict Health Protocols.**
- Patients with **hypertension are at increased risk of morbidity and mortality** if they become infected with **SARS-CoV-2,** although this is confounded by other factors such as **age and vascular disorders**.
- All usual **antihypertensive therapy** including **RAS inhibitors should continue.**
- Physicians need to take a **holistic and multidisciplinary approach** to patient management due the wide range of possible complications, **and biomarkers** can provide important **prognostic information.**
- **The role of telemedicine-based home blood pressure monitoring strategies can facilitate maintenance of good blood pressure control while social distancing is maintained.**
- **The most important requirement** is a **"redesign"** of the image of medical doctors being engaged in hypertension medicine to welcome **the New Normal of hypertension medicine.**