

Management of Hypertension in COVID-19 Era

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Abstract

Pandemic COVID-19 started as pandemic in china and it spreads fast to involve all countries in different part of the world. Early studies found that hypertensive patients affected by the virus had more hospitalizations and mortality. Some data of non-evidence based claimed that ACEi and ARBS in hypertension who infected by the virus may contribute to worse outcome.

Elderly hypertensive may over express ACE2 with or without COVID-19 infections. Over expression of ACE2 did not proven to be harmful for hypertensive patients regardless of elevated blood pressure (BP). Patients with medication should continue using them including ACEi or ARBS, in addition to lifestyle modifications to keep home BP < 135/85 MMHG.

Keywords: Hypertension; COVID-19; ACEi; ARBS; ACE2 Guidelines

Introduction

Pandemic COVID-19 started as pandemic in china and it spreads fast to involve all countries in different part of the world. Early studies found that hypertensive patients affected by the virus had more hospitalizations and mortality. Some data of non-evidence based claimed that Angiotensin converting enzyme inhibitors (ACEi) and Angiotensin-receptors blockers (ARBS) in hypertension who infected by the virus may contribute to worse outcome. In this short review will discuss hypertensive patients, COVID-19 and ACEi and ARBS.

Methods

The key words, Hypertension, COVID-19, ACEi, ARBS, ACE2 guidelines used to pub med, the combinations of the COVID 19 and hypertension included in this short review.

Discussion

Since discovery of sphygmomanometer for Blood Pressure (BP) measurement in 1905, and uncertainty exist about wither to reduce BP is beneficial or not until 1972 were the first guideline established by National High Blood Pressure Education Program (NBHPEP), after hypertension treatment proven by *JAMA* study [1] and recommended: A subject with a diastolic pressure of 95 mm Hg or more and/ or a systolic pressure of 160 mm Hg or more should be referred for a secondary screen and required to be treated. Subsequent guidelines recommend to lowering the BP to 120/80 MMHG. Up till now still BP. Goal is too far from recommended value worldwide. The prevalence of hypertension is high worldwide it is around 30 - 45% [2]. Approximately, 70% of Patients, Who Receive treatment do not reach

BP Goal in Europe [3]. There are a Lifetime increase of blood pressure with age in men and women according to Framingham study [4]. Hypertension associated risk factors include, male more than female, old age, smoking, overweight, Diabetes mellitus (DM), renal disease, hypercholesterolemia and mental stress [5].

Since December 2019, when coronavirus disease 2019 (Covid-19) emerged in Wuhan city and rapidly spread throughout China, data have been needed on the clinical characteristics of the affected patients.

In COVID-19 patients, Hospitalize in New York City, 50% was hypertension, 30% obese and 25% are diabetic with overall mortality 10% [6]. This will produce progressive impact on the population particularly on old age where in this study the median age was 62.2 (48.6 - 73.7) and patients who need ventilator support was older age of 64.5 (51.7 - 73.6). Garg., *et al.* found 72.6% of COVID-19 patients had hypertension, 41% was obese particularly in the younger age group [7]. This will impact on health system resources and will impact on health care practice where the influx of patients may affect the care of non COVID patients therefore prevention of COVID-19 infections is a priority which required the control of all risk factors which possibly be a cause for poor outcome. Apparently, there is a similarity between the risk factors for hypertension and COVID-19 infections.

However, the hypertension increases with age and old age associated with cluster of other disease which made COVID-19 hospitalization more in this category of patients. Angiotensin converting enzymes 2 (ACE2) proposed as a receptor for COVID 19 viral entry to the cells and consequently causes an injury particularly to the lung tissues. Upregulations of ACE2 by Angiotensin converting enzymes inhibitors (ACEi) has been reported by Sommerstein and Grani [8], which led to a clinical concerns for patients and physicians in regards to uses of inhibitors of the Renin Angiotensin Aldosterone system (RAAS) which may precipitate severe acute respiratory syndrome coronavirus 2 (SARSCoV2) infected individuals.

Patients using ACE-Is or ARBs possibly more susceptible for viral infection with higher mortality because of their old age had more comorbid conditions like hypertension, diabetic, and renal disease. The control of blood pressure in china was 10% only despite a 50% of Chinese between the ages of 35 - 75 years were hypertensive [9]. The uses of ACEi or ARBs will be for hypertension or heart failure both occur in old age which will led to poor outcome when infections superadded. Additionally, demographic data showed increase ACE2 in old age and male sex without using ACEi or ARBs [10-12].

In animal study SARS-COV spike protein of COVID-19 produce down regulation of ACE2 associated with severe lung injury in which administration of an ARB will increase ACE2 which considered being protective [13,14]. Recent study of 8910 patients with COVID-19 infections confirmed previous observations that cardiovascular disease is at increased risk of in-hospital death and no increase death in associations with ACEi or ARBS treatment [15]. 188 patients using RAAS inhibitors out of 1128 with hypertension infected by COVID-19, Unadjusted mortality rate was lower in the ACEi/ARB group than non- ACEi/ARB group (3.7% vs. 9.8%; $P = 0.01$) [16]. Similarly a new population study in Italy 6272 case infected with COVID-19, where the RAAS inhibitor was more used in the case than the control and there was no evidence that, ACE inhibitors or ARBs affected the risk of COVID-19 [17].

It is clear from the available data that overexpression of ACE2 has no impact negative or positive as there are a conflicting data for and against until now no clear evidence that blocking RAAS system is harmful, the need for more research in this area is of paramount importance. Recently Gabriela Mk [18], irrespective of COVID-19, patients on ACEi or ARBs should continue using them because clinical practice guidelines (CPG) confirmed the benefits of these medications in their indications in reducing mortality. Withdrawal or switching this medication for patients with COVID 19 from the fear of possible negative effect is not advisable at this point of time.

Based upon the information available about RAS inhibitors and COVID-19, major clinical societies recommended continuing using the important treatment like ACEi or ARBS, regardless of COVID 19. These societies include American College of cardiology (ACC), heart

failure association (HFSA) and American Heart associations (AHA). Similarly, in march 13, 2020, European society of cardiology (ESC) and hypertension Canada emphasize the continuing treatment of hypertension and other cardiovascular disorder requiring ACEi or ARBs. Finally, hypertension council of ESC recommends that physicians and patients should continue treatment with their usual anti-hypertensive therapy because there is no clinical or scientific evidence to suggest that treatment with ACEi or ARBs should be discontinued because of the Covid-19 infection. Patients wither HTN or HF, should continue their usual drugs regardless of the COVID 19, infections, additionally patients with HTN should monitor their blood pressure at home and home BP should be less than 135 MMHG systolic and less than 85 MMHG diastolic as it is different from office BP which is < 140/90 MMHG [19]. Lifestyle modification should continue in the form of weight reduction, exercise, salt reduction, mental relaxation, stop smoking and healthier food.

Conclusion

Hypertension is a common disease affecting more the old age and it associated with clusters of risk factors. Hypertension is not well control worldwide. Elderly hypertensive may over express ACE2 with or without COVID 19 infections. Patients with medication should continue using them including ACEi or ARBS, in addition to lifestyle modifications to keep home BP < 135/85 MMHG.

Conflict of Interest

No conflict of interest belongs to this article.

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