The Covid-19 pandemic compromised routine care for hypertension

A survey conducted among Excellence Centers of the European Society of Hypertension

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Abstract

**Background:** Major catastrophes are frequently followed by an increase in blood pressure, cardiovascular disease and mortality. Among other factors, a disaster-associated compromise of patient care due to other priorities may play a role.

**Methods:** We conducted a 17-question electronic survey among the Excellence Center (EC) network of the European Society of Hypertension to assess the influence of the Covid-19 pandemic and the associated public lockdown on routine care for hypertensive patients.

**Results:** Overall, 52 ECs from 21 European and 2 Latin American countries participated, providing hypertension service for a median of 1500 (range 40 - 25,000) hypertensive patients per center per year. 84.6% of the EC reported a shutdown during the peak of the pandemic, lasting for 9 weeks (range 0 – 16 weeks). The number of patients treated per week decreased by 90%: from a median of 50 (range 10 – 400) before the pandemic to a median of 5.0 (range 0 – 150) during the pandemic (p<0.0001). 60% of the patients (range 0-100%) declared limited access to medical consultations during the shutdown. The majority of EC (59.6%) could not provide 24-hour ambulatory BP monitoring during the pandemic, whereas a median of 63% (range 0 – 100%) of the patients treated were regularly performing home BP monitoring. In the majority (75%) of the EC, hypertension service has returned to normal after the first wave of the Covid-19 pandemic.

In 66% of the EC, the physicians received many questions regarding concerns about the use of Renin-Angiotensin system (RAS) blockers. Stopping RAS-blocker therapy either by patients or physicians was reported in 26.9% and 36.5% of the EC, respectively.

**Conclusion:** Patient care in hypertension EC was compromised during the Covid-19 related shutdown of healthcare systems in many countries. These data highlight the necessity to develop new strategies for hypertension care including the use of virtual / telemedicine to maintain services during challenging times. The mid- and long-term consequences of compromised care for hypertension on cardiovascular events remain to be seen.

**Key words:** Covid-19, blood pressure, hypertension routine care, RAS inhibitors
Introduction

Following major natural catastrophes, man-made environmental disasters or terror attacks, for instance earthquakes\(^1\), hurricanes\(^2\), Tsunamis, nuclear power plant accidents\(^3\) and the 9/11 terror attack\(^4\), an increase in blood pressure (BP)\(^1\)\(^-\)\(^4\), cardiovascular disease\(^5\) and mortality\(^6\) have been observed\(^7\). The unprecedented ongoing global Corona-virus disease 2019 (Covid-19) epidemic likely will have unfavourable health consequences in the mid- to long-term, unrelated to the virus itself, due to worsening control of cardiovascular risk factors\(^8\) during the pandemic. Regarding control of high BP, patients may be at increased risk during the pandemic and in the long-term, due to many factors, including the following: (1) acute and prolonged stressors may lead to activation of the sympathetic nervous system, the Renin-Angiotensin system (RAS) and other endogenous factors resulting in increased BP; (2) during the lockdown, lifestyle factors associated with high BP (salt and alcohol intake, body weight, regular exercise) may have worsened\(^9\); (3) the medical crisis may be followed often by an economic and social crisis, evidenced for instance by increasing rates of unemployment; (4) Covid-19 itself may carry long-term cardiovascular risk, as not only the lung, but also the cardiovascular system and the kidneys can be affected during the illness; and (5), during the lockdown, regular patient care for chronic diseases like hypertension may be compromised\(^10\) in many regions of the world.

The latter issue has not been addressed so far. We therefore set out to quantify the problem, and explore the impact of the Covid-19 pandemic on hypertension care in clinical practice.

Methods

We took advantage of the network of Excellence Center(s) (EC) of the European Society of Hypertension (ESH) and conducted a 17-question electronic survey designed to assess the influence of the Covid-19 pandemic and the associated public lockdown on the care for hypertensive patients. The questionnaire (Online Supplement) was drafted by the person in charge (T.W.) of the EC program and subsequently reviewed and finalized by the Covid-19 Task Force of the ESH. The information regarding the survey was sent to all representatives of EC in June 2020 by email. The survey was made available online to all EC between June 15\(^{th}\) and July 3\(^{rd}\), 2020. The results were compiled by ESH staff.

Statistical analysis were performed, using MedCalc version 13.0.2.0 (MedCalc software, Mariakerke, Belgium) for descriptive statistics. All numerical parameters (except duration of
lockdown) were non-normally distributed. Numbers given are frequencies and percentages, medians and ranges.

**Results (Figure)**

Overall, 52 EC located in 21 European and 2 Latin American countries participated in the survey (7 from Greece and Italy, 6 from Spain, 5 from UK, 3 from Hungary, 2 from Austria, Brasil, France, Germany, Serbia, Sweden, and 1 from Argentina, Armenia, Belgium, Bulgaria, Czech Republic, Estonia, Finland, Poland, Romania, Russia, Slowenia, and Switzerland, respectively). In each of these EC, a median of 1500 hypertensive patients are treated per year (range 40 - 25,000).

84.6% of the EC reported, that they had a lockdown for not-acute non-Covid-19 patients during the peak of the pandemic in their country. EC without a lockdown were located in Russia (2 EC), UK (2 EC), Finland (1 EC), Italy (1 EC), Slowenia (1 EC), and Sweden (1 EC).

During a regular week (before the Covid-19 pandemic), a median of 50 (range 10 – 400) patients were seen in the EC, 87.5% (range 0-100 %) as outpatients. During the Covid-19 pandemic, a median of 5.0 (range 0 – 150) patients were seen in the EC (minus 90%, p<0.0001, Wilcoxon test), but only 5% (range 0-100 %) on an outpatient basis.

The majority of EC (57.4%) could not provide 24-hour ambulatory BP monitoring during the Covid-19 pandemic, some EC only in a few cases, for instance in case of pregnancy, or following a hypertensive emergency or urgency. A median of 63% (range 0 – 100 %) of the patients treated at the EC were regularly performing home BP monitoring during the pandemic.

The EC reported that 60% of the patients (range 0-100%) declared limited access to medical consultations during the Covid-19 pandemic, and only very few (median 0% of the patients, range 0-60%) declared limited access to pharmacies or lack of availability of antihypertensive drugs during the Covid-19 pandemic.

The shutdown lasted for a median of 9 weeks (range 0 – 16 weeks) in the individual EC. In two thirds of the EC, the hypertension service returned to regular function again by the end of June 2020, after the first wave of the Covid-19 pandemic, while in some EC (11.1%) the service was still limited to urgent consultations, or by using telemedicine approaches only. In almost 20% of the EC, the hypertension service was still not available for non-urgent care by the end of June 2020. Overall, 11 EC reported the use of some form of telemedicine approaches
(phone calls, email, dedicated telemedicine platforms) during the Covid-19 pandemic or during the phase of rebuilding the hypertension service.

In 66% of the EC, the physicians received many questions regarding the use of RAS blockers, while in additional 11.5% of EC only a few questions were received. Overall, the need to change antihypertensive drug treatment during the pandemic was low (range 0 – 30%). 26.9% of the EC reported that they experienced that some hypertensive patients stopped taking RAS blockers by themselves during the pandemic, and 36.5% of the EC reported that some physicians stopped RAS-blockers in some of their hypertensive patients during the Covid-19 pandemic.

**Discussion**

During a major catastrophe, it is obvious, necessary and clearly indicated that healthcare resources are directed towards immediate relief for acutely injured or diseased patients. The incident alone can, depending on its dimension and intensity, bring healthcare systems to their limits or beyond, as evidenced again by the ongoing Covid-19 pandemic. However, a side effect of this approach may be a compromise of routine healthcare for other, in particular for chronic non-communicable diseases, which in the long term may be deleterious\(^8\). In this work, we aimed to quantify the limitations of routine care for hypertension during the ongoing Covid-19 pandemic and observed, that these limitations are not trivial. The number of patients treated for hypertension in the participating EC dropped by 90%, the majority of patients declared limited access to routine healthcare, the problem lasted for a median of two months, and in almost 20% of the participating centers, routine care for patients with hypertension was still not available by the end of June 2020. Given the fact that high BP is the leading cause of death and disability worldwide\(^{11}\), these facts are worrisome and add to the reports that emergency room visits and hospital admissions due to acute cardiovascular diseases (myocardial infarction\(^{12}\), stroke\(^{13}\)) were surprisingly lower and the presentation was delayed during the peak of the Covid-19 pandemic.

The observations that hypertension is the most prevalent comorbidity in patients hospitalized with Covid-19\(^{14,15}\) and that hypertensive patients may be at increased risk for complications\(^{16}\) have attracted much attention. Following along these lines, limited care for hypertensive patients during the pandemic may leave them at increased risk for a potentially upcoming “second wave”.


Another topic that attracted major attention and linked hypertension and Covid-19, was the discovery that the severe acute respiratory syndrome coronavirus-2 (SARS-Cov-2), the pathogenic agent for Covid-19, uses angiotensin-converting enzyme 2 (ACE2)—an enzyme potentially up-regulated by RAS inhibitors - as a viral entry receptor in lung cells. This lead initially to concerns that the use of ACE-inhibitors (ACE-I) or angiotensin receptor blockers (ARBs) may increase the risk of Covid-19 infection. As a solution, switching to another antihypertensive agent was suggested. These considerations, initially confined to medical journals, were widely broadcasted in the lay press. Although the ESH as early as in March 2020, followed by other learned medical societies, including national Hypertension societies, argued carefully and strongly recommended not to discontinue RAS inhibitors, uncertainty remained among patients and physicians. Our survey clearly indicated that (1) specialists working in ESH EC received many questions regarding this issue (which is adequate), (2) in one quarter of EC, some hypertensive patients discontinued RAS blockers on their own, and (3) in one third of the EC, it was observed that some physicians discontinued RAS blockers in some of their patients. In the meantime, observational evidence is mounting that the use of ACEIs or ARBs (or any other first line antihypertensive drug class) does not increase the risk for Covid-19 or severe Covid-19. Moreover, randomized clinical trials are underway, investigating the opposite, i.e. if RAS blockers may indeed have a protective role in Covid-19.

According to the recent 2018 European Society of Cardiology / European Society of Hypertension Guidelines for the management of arterial hypertension, out-of-office BP measurement is an important step in the evaluation of high BP and has a wide range of specific indications. Whereas the ability of the EC to provide 24-hour ambulatory BP measurement has been severely compromised, as indicated by our results, home BP measurement is an ideal and feasible substitute under the conditions of the pandemic, even if the guidelines make some useful distinctions between both. Telemonitoring of BP has been mentioned in the guidelines as well, offering a couple of advantages (for instance improvement of adherence). During the Covid-19 pandemic, it has been widely used for obvious practical reasons, recommended for cardiovascular diseases in particular, and expanded to teleconsultations or, in a broader sense, to “delivering healthcare remotely.”

A potential limitation of our study is the fact that the numbers given by the EC may represent more an estimate than an extraction of data from large hospital databases, and as such have to be taken with some caution. However, we strongly believe that the trends shown in our
survey are robust. Moreover, we do not have access to intermediate (i.e. BP measurements) or cardiovascular outcome data within this survey. On the other hand, we provide evidence from the representatives of 52 dedicated EC in 21 European and 2 Latin American countries, which is very adequate, given the worldwide spread of Covid-19.

In summary, we observed that routine patient care for hypertension was compromised during the Covid-19 related shutdown of healthcare systems in many countries. The mid- and long-term consequences on BP control and cardiovascular events remain to be seen. Importantly, our data highlight the need to develop new strategies for care of patients with chronic diseases including hypertension by expanded use of teleconsultations or, in a broader sense, to “delivering healthcare remotely” to maintain services during challenging times such as the Covid-19 pandemic.
Figure legend

*Figure: Summary of the effects of Covid-19 and the associated lockdown on routine care for hypertensive patients.*
References


Figure