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The corona-virus disease 2019 pandemic compromised routine care for hypertension: a survey conducted among excellence centers of the European Society of Hypertension

European Society of Hypertension Corona-virus Disease 19 Task Force*

Background: The Covid-19 pandemic caused a shutdown of healthcare systems in many countries. We explored the impact on hypertension care in the Excellence Center (EC) network of the European Society of Hypertension.

Methods: We conducted a 17-question electronic survey among ECs.

Results: Overall, 52 ECs from 20 European and three non-European countries participated, providing hypertension service for a median of 1500 hypertensive patients per center per year. Eighty-five percent of the ECs reported a shutdown lasting for 9 weeks (range 0–16). 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 patients (range 0–100%) declared limited access to medical consultations. The majority of ECs (57%) could not provide 24-h ambulatory BP monitoring, whereas a median of 63% (range 0–100%) of the patients were regularly performing home BP monitoring. In the majority (75%) of the ECs, hypertension service returned to normal after the first wave of the pandemic. In 66% of the ECs, the physicians received many questions regarding the use of renin–angiotensin system (RAS) blockers. Stopping RAS-blocker therapy (in a few patients) either by patients or physicians was reported in 27 and 36.5% of the ECs.

Conclusion: Patient care in hypertension ECs was compromised during the Covid-19-related shutdown. These data highlight the necessity to develop new strategies for hypertension care including virtual clinics to maintain services during challenging times.

Keywords: Covid-19, blood pressure, hypertension routine care, renin-angiotensin system inhibitors

Abbreviations: ACE, angiotensin-converting enzyme; ABPM, ambulatory blood pressure monitoring; ARBs, AT1 blockers; RAS, renin–angiotensin system

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) pandemic is likely to have unfavorable health consequences in the mid-term to long-term, which may not directly relate to the virus itself, but is due to suboptimal control of cardiovascular risk factors [8] during the pandemic. Regarding control of hypertension, patients may be at increased risk during the pandemic and in the long-term, as a result of the following: first, acute and prolonged stressors may lead to activation of the sympathetic nervous system, the renin–angiotensin system (RAS) and other endogenous factors which result in increased BP; second, during the lockdown, the risk of lifestyle factors associated with high BP (increased salt and alcohol intake and body weight, lack of regular exercise) increases [9]; third, the medical crisis may be followed often by an economic and social crisis, evidenced for instance by increasing rates of unemployment; fourth, 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 fifth, 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.

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TABLE 1. Corona-virus disease 2019 Questionnaire for Excellence Centers of the European Society of Hypertension

Date
Name of excellence center
Head of excellence center
Country
Number of hypertensive patients in your center
Did you have a lockdown for not-acute non-Covid-19 patients during the peak of the pandemic?
How many patients with hypertension do you see during a regular week in your center?
How many of them do you treat in an outpatient clinic? (percentage)
How many patients with hypertension did you see during a week during the pandemic in your center?
How many of them did you treat in an outpatient clinic during the pandemic? (percentage)
Could you provide 24-h ABPM during the pandemic?
What percentage of patients seen at your center performed regularly HBPM during the pandemic?
What percentage of patients seen at your center declared limited access to medical consultations during pandemic?
What percentage of patients seen at your center declared limited access to pharmacies or lack of antihypertensive drugs during pandemic?
How long was the shutdown of the hypertension service in your hospital? (weeks)
Is the hypertension service in regular function again after the pandemic?
Did you receive many questions from patients regarding RAS blockers during the pandemic?
In how many patients did you have to change antihypertensive treatment? (percentage)
Did you experience that some hypertensive patients stopped by themselves taking RAS blockers during the pandemic?
Did you experience that some physicians stopped in some patients RAS blockers during the pandemic?
Could you provide results of lab and/or instrument examinations in your hypertensive patients during the pandemic?

ABPM, automated blood pressure monitoring; Covid-19, corona-virus disease 2019; HBPM, home blood pressure monitoring; RAS, renin-angiotensin system.

METHODS

We took advantage of the network of excellence centers 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 (Table 1) was drafted by the person in charge (T.W.) of the excellence center 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 excellence centers in June 2020 by e-mail. The survey was made available online to all excellence centers between 15 June 2020 and 3 July 2020. The results were compiled by ESH staff. The current work was an evaluation of clinical service provided by physicians and not related to patient data, therefore ethical approval was not required.

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 nonnormally distributed. Numbers given are frequencies and percentages, medians and ranges.

RESULTS

Overall, 52 excellence centers located in 20 European, two Latin American and one Middle Eastern countries participated in the survey (eight from Italy, seven from Greece, six from Spain, four from the United Kingdom, three from Hungary, two from Austria, Brazil, France, Germany, Serbia, Sweden and one from Argentina, Armenia, Belgium, Bulgaria, Czech Republic, Estonia, Finland, Lebanon, Poland, Romania, Slovenia and Ukraine, respectively). In each of these excellence centers, a median of 1500 hypertensive patients are normally treated per year (range 40–25 000) (Fig. 1).

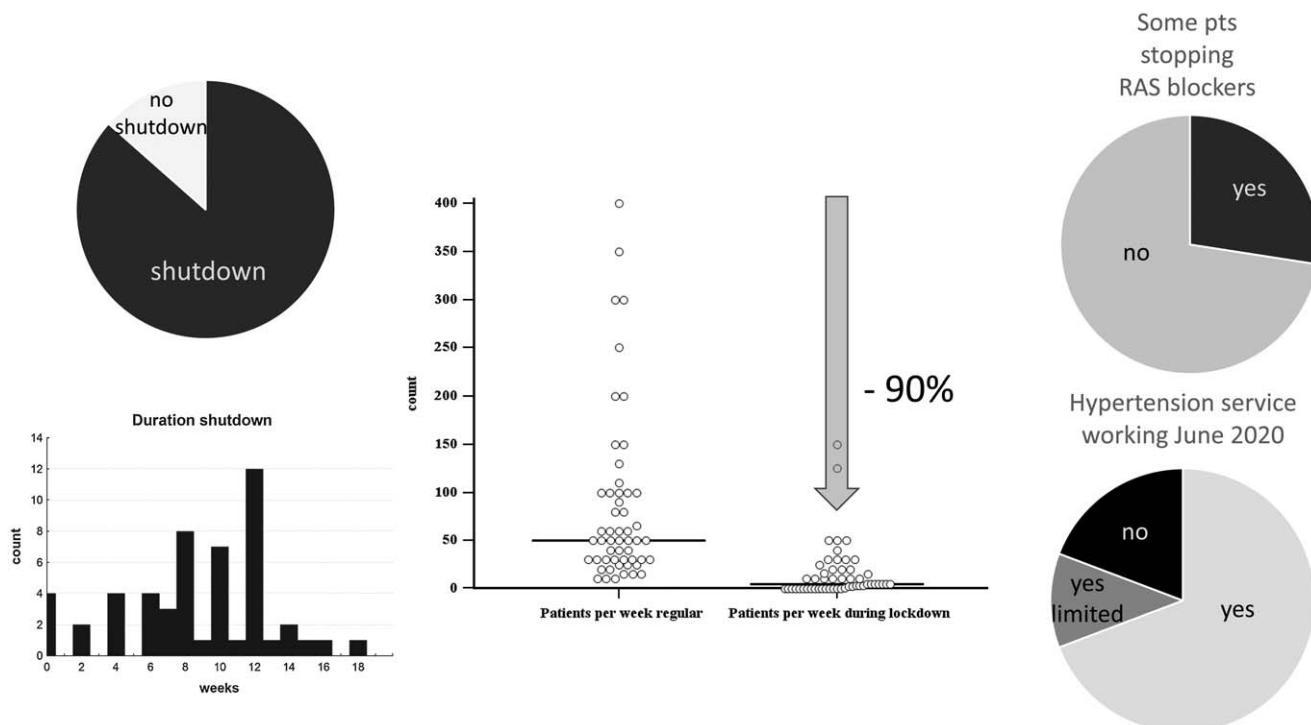


FIGURE 1 Summary of the effects of corona-virus disease 2019 and the associated shutdown of routine healthcare services for hypertensive patients.

Eighty-five percent of the excellence centers reported that there was a shutdown of services for nonacute non-Covid-19 patients during the peak of the pandemic in their country. Excellence centers that remained in operation were located in the United Kingdom (two excellence centers), Finland (one excellence center), Italy (one excellence center), Slovenia (one excellence center), Sweden (one excellence center) and Ukraine (one excellence center).

During a regular week (before the Covid-19 pandemic), a median of 50 (range 10–400) patients were seen in the excellence center, 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 excellence centers (minus 90%, $P < 0.0001$, Wilcoxon test), however only 5% (range 0–100%) as outpatients.

The majority of excellence centers (57%) could not provide 24-h ambulatory BP monitoring (ABPM) during the Covid-19 pandemic. Some excellence center only performed ABPM in selected cases, for instance in pregnancy, or following a hypertensive emergency or urgency. A median of 63% (range 0–100%) of the patients treated at the excellence centers were regularly performing home BP monitoring during the pandemic.

The excellence centers 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%, range 0–60%) declared that patients had limited access to pharmacies or lack of availability of antihypertensive drugs during the Covid-19 pandemic.

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

In 66% of the excellence centers, the physicians received many questions regarding the use of RAS blockers, while in additional 11.5% of excellence centers only a few questions were received. Overall, the need to change antihypertensive drug treatment during the pandemic was low (range 0–30%). 27% of the excellence centers reported that they experienced that some hypertensive patients stopped taking RAS blockers by themselves during the pandemic, and 36.5% of the excellence centers reported that these drugs were stopped in some patients by physicians.

DISCUSSION

During a major catastrophe, the most appropriate action is for healthcare resources to be directed toward the provision of immediate relief for acutely injured or diseased patients. The incident alone can, depending on severity and extent, 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 patients, in particular for chronic noncommunicable diseases, which in the long term may be deleterious [8]. In this survey, 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 excellence centers dropped by 90%; the majority of patients had 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. They 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, which in turn increased morbidity and mortality in the acute setting [14].

The observations that hypertension is the most prevalent comorbidity in patients hospitalized with Covid-19 [15,16] and that hypertensive patients may be at increased risk for complications [17] including mortality [18] – although this was not a universal finding [19] – 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’ of Covid-19.

Another topic that attracted major attention and linked hypertension and Covid-19, was the discovery that the severe acute respiratory syndrome coronavirus-2, the pathogenic agent for Covid-19, utilizes angiotensin-converting enzyme (ACE) 2 – an enzyme potentially upregulated by RAS blockers – as a viral entry receptor in lung cells [20]. This led initially to concerns that the use of ACE-inhibitors (ACEIs) or AT1 blockers (ARBs) may increase the risk of Covid-19 infection [20–22]. As a solution, switching to another antihypertensive agent was suggested [22]. 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 results clearly indicate that first, specialists working in ESH excellence centers received a significant number of enquiries regarding this issue; second, in one-quarter of excellence centers, some hypertensive patients discontinued RAS blockers on their own; and third, in one-third of the excellence centers 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 [23–25] or severe Covid-19 [24,26]. Moreover, randomized clinical trials [27] are underway, investigating the role of RAS blockers in Covid-19, that is if there is a protective effect [28].

According to the recent 2018 ESC/ESH Guidelines for the management of arterial hypertension [29], out-of-office BP measurement is an important step in the evaluation of high BP and has a wide range of specific indications. Our results show that whereas the ability of the excellence centers to provide ABPM has been severely compromised, home BP measurement is an ideal and feasible substitute under the conditions of the pandemic. Telemonitoring of BP has also been highlighted in the guidelines, offering a number of advantages (for instance improvement of adherence). During the Covid-19 pandemic, home telemonitoring has been widely utilized for obvious practical reasons, and is recommended for cardiovascular diseases in particular [30]. Furthermore, telemonitoring can be extended to teleconsultations or, in a broader sense, to 'delivering healthcare remotely [31]'.

A potential limitation of our study is the fact that the numbers given by the excellence centers may represent more an estimate than an extraction of data from large hospital databases, and as such have to be taken with some caution. In addition, our figures reflect activity in excellence centers which do not necessarily represent the management of hypertension in primary care facilities. 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. Nevertheless, we provide evidence from the representatives of 52 dedicated excellence centers in 20 European, two Latin American and one Middle East countries, which attempts to cover a significant number of countries, 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-term 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 utilizing teleconsultations or, in a broader sense, to 'delivering healthcare remotely [31]' to maintain services during challenging times such as the Covid-19 pandemic.

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Conflicts of interest

There are no conflicts of interest.

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