LETTER TO THE EDITOR **DOI: XXX**

First aid for hypertension: potentially lifesaving but neglected domain of emergency response

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1. To the editor-in-chief

Hypertension is highly prevalent and associated with increased morbidity and mortality. According to the world health organisation (WHO), globally, about 1.28 billion adults aged 30-79 years suffer from hypertension, and only 21% of them have the disease under control (1). Hypertension is a major cause of premature death worldwide. An estimated 7.5 million annual deaths are attributable to elevated blood pressure (BP) (2). Many people die because of acute complications of hypertension, such as pulmonary oedema, stroke, myocardial infarction, and aortic dissection. Assurance of prompt recognition and adequate management of hypertensive urgencies and emergencies, therefore, constitutes an important public health concern.

Hypertension usually falls off the radar of statistics of emergency medical services' (EMS) activations because popular triage systems used by emergency communication centres do not classify abnormally high BP as a stand-alone determinant code. That said, the prevalence of hypertension among the visitors of emergency departments (ED) exceeds 40% (3), and a large proportion of emergency department (ED) patients with hypertension are hospitalised (4). As the rates of hypertension-related ED visits are rising (4), the related burden on health systems becomes an issue of growing significance. The increasing trend for ED admissions was also shown for hypertensive urgencies and emergencies (5) — cases of very high BP (180/110 mmHg) without (urgency) or with (emergency) acute hypertension-mediated target organ damage. Approximately one in every 200 patients presents to the ED with a suspected hypertensive urgency or emergency (6).

ED utilisation reflects community demand for prehospital emergency help, including first aid. The high prevalence of increased BP among ED visitors suggests that hypertension may constitute one of the priorities for public first-aid response. Timely administration of first aid may reduce the risk of life-threatening complications, prevent the need to activate EMS, and alleviate overcrowding in busy hospital emergency rooms. Furthermore, first aid could be the only way to give help where EMS arrival is delayed or impossible, for instance, in rural and wilderness settings, or in humanitarian crises and disasters that compromise the provision of primary and secondary health care. Bystanders help or self-help for high BP well fits with the current international definition and goals of first aid, namely the initial care provided for an acute illness or injury for preserving life, alleviating suffering, preventing further illness or injury, and promoting recovery (7).

To ensure maximum efficiency and safety, first aid practices should follow recommendations formulated by authoritative societies based on systematic evaluation of the best available scientific evidence. To understand the existence, nature, and coverage of recommendations on first aid for high BP, 25 national and international English-language guidelines on first aid published between 2000 and 2024 were examined. As can be seen from the generated dataset (8), the guidelines covered an extensive range of health conditions (n=60), varying from life-threatening emergencies like cardiac arrest or choking to relatively innocuous disturbances such as flash eye or abrasions. However, all the documents omitted recommendations on first aid for hypertension, and hypertension is not among the knowledge gaps set out by the guidelines as a roadmap for future research.

Then, English-language clinical guidelines devoted to the management of hypertension were reviewed. This involved an in-depth examination of 19 documents published within the last decade by relevant national societies (of Australia, Brazil, Canada, China, India, Japan, Korea, the UK, and the USA) and international bodies, including the latest guidelines developed by the WHO, the international society of hypertension, the European society of hypertension, and the European society of cardiology. Being mainly intended for use by health care providers and focusing on BP management in regular care settings, none of the documents explicitly addressed first aid for hypertension (9). And still the guidelines' analysis revealed a number of consistent evidence-based provisions which seemingly can be translated from exceptionally clinical application to the following universal recommendations on first aid for acute severe hypertension: 1) immediately seek for medical care in cases of very high BP (180/110 mmHg that corresponds to a hypertensive urgency or emergency); 2) stay with the victim and

closely observe their condition for signs of deterioration until the arrival of professional help; 3) attempt to remove causes and incentives of elevated BP (in particular, reduce stress to the victim by ensuring quiet and calm surroundings, help the victim to get in comfortable position, provide psychological support to the victim); 4) give rest to the victim (significant reduction of BP in response to rest alone was achieved in over 32% of patients with hypertensive urgencies admitted to ED (10)); and 5) avoid excessive or rapid lowering of BP with antihypertensive drugs (as this can lead to the reduction of tissue perfusion pressure and induce ischemic events).

Being reputable and influential papers, evidence-based guidelines on first aid determine the best practices of education on first aid and provision of non-medical help and delineate the first-aid research agenda. An addition of a dedicated "First Aid for Hypertension" section to future comprehensive guidelines on first aid as well as to clinical guidelines focused on the management of high BP, should lay a solid foundation for the development and implementation of standardised and widespread practices of public training and community response to hypertension that in turn may greatly contribute to a reduction of related cardiovascular morbidity and mortality. At the outset, respective sections can be composed of the straightforward recommendations, which have already, albeit indirectly, been endorsed by the international community of experts in hypertension management. Furthermore, this change in the guidelines would facilitate international research endeavors aimed at conducting new studies and performing systematic evidence evaluations to determine the optimal practices of first aid for hypertension. Conversely, the ignorance of first aid, a promising and readily available resource for improving outcomes of people with hypertension, implies inevitable and continuous but potentially preventable public health losses.

2. Declarations

2.1. Acknowledgement

None.

2.2. Conflict of interest

The author declares that he has no conflict of interest.

2.3. Funding

None.

2.4. Data Availability

The datasets generated and analysed during the current study are available in the Mendeley Data repository (8,9).

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