Medical Xpress

Firefighters' blood pressure surges in response to emergency calls

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When the alarm sounds for an emergency, blood pressure among firefighters often soars, according to preliminary research funded by the American Heart Association and presented today at the Association's

Scientific Sessions 2021.

"All emergency and first responders should be aware of their health. They should know what their typical blood pressure level is and be aware of how it fluctuates. Most important, if they have high blood pressure, they should make sure it is well-controlled," said Deborah Feairheller, Ph.D., senior author of the study and director of the HEART (Hypertension and Endothelial function with Aerobic and Resistance Training) Lab and clinical associate professor of kinesiology at the University of New Hampshire in Durham, New Hampshire.

From 2019-2021, 41 volunteer and municipal firefighters from the suburban Philadelphia area and from the Dover, New Hampshire, area wore ambulatory blood pressure monitors during an on-call work shift lasting at least 12 consecutive hours. In addition to the automatic blood pressure readings from the monitor, study participants were instructed to prompt the monitor to take a blood pressure reading whenever a pager or emergency call sounded and whenever they felt they entered a stressful situation. Participants documented activities and call types on log sheets for each measurement. The firefighters included 37 men and 4 women. Their average age was 41.2 years, and all participants were white. They had an average of 16.9 years on the job and measured as overweight or having obesity. Average body mass index (BMI) of all participants was 30.3, with BMI≥25 defined as overweight, while BMI≥30.0 is defined as obesity. The firefighters all had high blood pressure, defined as systolic blood pressure (the top number in a reading) as 130 mm Hg or higher, or a diastolic blood pressure (bottom number) of 80 mm Hg or higher, as defined by the American Heart Association's most recent guideline.

The researchers found:

- The average blood pressure during the shift was 131/79.3 mm

Hg. Average heart rate was 75.7 beats per minute.

- Compared with the reading immediately preceding the call, systolic blood pressure surged an average of 19.2 mm Hg with fire calls and 18.7 mm Hg with medical calls.
- Compared with the reading immediately preceding the emergency call, diastolic (bottom number) blood pressure surged 10.5 mm Hg with fire calls and 16.5 mm Hg with medical calls.
- Compared with the average blood pressure during the entire 12-hour shift, systolic blood pressure was 9% higher during fire calls, and diastolic blood pressure was 9% higher during medical calls.
- Average heart rate also increased during both types of calls: 10 beats per minute with fire calls, and 15 beats per minute for medical calls.
- There were no significant differences in blood pressure, heart rate or blood pressure surge levels when comparing responses among fire calls, medical calls, riding an emergency vehicle or false alarms.

"The public knows the value that emergency responders provide to communities. We hope to increase awareness that many firefighters have hypertension and that their blood pressure can increase to very dangerous levels when responding to emergency calls," said Feairheller.

High blood pressure affects almost half of American adults, however, the rate of high-blood pressure among firefighters is much higher, with about three out of four affected. High blood pressure raises the risk of heart attack and stroke, and more than half of deaths among firefighters in the line of duty are related to cardiovascular disease.

"The current data show that almost 75% of firefighters have hypertension, and less than 25% have their blood pressure under control. I hope that our research can help identify occupational factors that affect

blood pressure and increase awareness among this population," said Feairheller.

They were also surprised at the findings on diastolic blood pressure increases. "We anticipated systolic blood pressure surges because that reading is usually more responsive to stimuli; however, the extent of the diastolic blood pressure surge was unexpected," said Feairheller.This pilot study is limited by including a small number of participants and not having blood pressure measurements collected when firefighters were away from work. Results from this group of firefighters who were white and mostly male may not be generalizable to women firefighters and those from diverse racial and ethnic groups.

The investigators are currently evaluating whether a healthy exercise and diet program could help to lower the blood pressure surge that firefighters experience during emergency calls.

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Provided by American Heart Association

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