Job strain and hypertension

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It is well known that blood pressure increases when one perceives challenging demands or is exposed to unexpected strains. In the long run, this acute effect might lead to elevated blood pressure that is, hypertension, which is the focus of the review by Babu et al. The team undertook meta-analyses of nine epidemiological studies which used hypertension as a dependent variable and job strain as independent. Only nine studies were eligible, but cohort and case control studies showed modest significant relationships. It is worth noting that all studies with good methodological quality were positive, while others showed different results. As stated by the authors, earlier reviews have questioned the notion that psychosocial strain leads to hypertension. However, this field of research is precarious as exposure and outcome are difficult to assess.

First, how should the relevant exposure be measured? As the underlying mechanism for a relationship between strain and hypertension is expected to be stress (i.e., physiological stress reactions including activation of the sympathetic nervous system), measures that include the perception of strain (i.e., stressors) are relevant. Such measures were used in all the methodologically ‘good’ studies in the review. More objective measures like long working hours, as used in the two Japanese studies, did not show any significant relation to hypertension. This might be expected as long working hours could be associated with high job satisfaction, and would not necessarily constitute a psychological stressor. So-called objective measures of exposure are not necessarily valid, as their impact would depend on how they are perceived.

It is important to notice that the studies in question used exposures related to only some parts of work organisation and demands at work. Emotional exposures, such as bullying and harassment, may lead to even higher increases in blood pressure and subsequent hypertension. These exposures have not been studied in the context of hypertension. Other exposures such as job insecurity due to economic conditions, lack of social support, etc., might be relevant, as the Karasek Job Strain model measures only a part of the strain at work. One might focus on the major part of stressors and resources as suggested by Bakker et al. in the Job Demands-Resources model. These exposures are easily measured by the use of tools such as the Copenhagen Psychosocial Questionnaire. However, most studies have only single-point estimates of the exposure. The exposure under study might change in intensity and the duration of exposure is unknown in all studies. Studies where long-term exposure has changed show more stressful living conditions were associated with an increase in blood pressure. An example is a case in Panama where indigenous people moved to the city from a rural environment, which was found to result in increased prevalence of hypertension. Those who stayed in rural living conditions did not show the age-dependent increase in blood pressure normally found in urban environment.

Second, since a part of the population receives treatment for hypertension, the effective measure of hypertension might be an uncertain one in epidemiological studies. We cannot rely on blood pressure measures alone, as an estimated fifth of the population under study is on medication that decreases blood pressure for a variety of reasons. We should also consider the possibility of ‘white coat hypertension’. It is probable that measurement of blood pressure after a few minutes of relaxation is the most valid measure as it has been recommended and used in many epidemiological studies.

The most serious problem in this context might be that the exposure and the effect are measured only once or very few times in the studies. All the mentioned points might lead to bias in epidemiological studies. The effect would most likely be an underestimation of the relationship between job strain and hypertension. The only study measuring exposure for almost a lifetime is a famous Italian study on nuns, who, even in old age, stayed normotensive, in contrast with other Italian women.

The most authoritative way of showing the relationship between psychological strain at work and hypertension would be to conduct intervention studies using ambulatory blood pressure as the effect measure. It is a clinical experience that improvement of working conditions in some people will lead to normal blood pressure. This has been demonstrated among bus drivers.

The many methodological pitfalls related to the research into the relationship between job strain and hypertension still exist, but Babu et al. have contributed to the notion that there is in fact such a relationship, at least for those who are predisposed to developing hypertension. The magnitude and closer characterisation of its nature have yet to be studied in more detail.

The primary clinical implication of this is that those who treat people with high blood pressure should rule out to what extent working conditions may at least partly be responsible for the condition. In addition, it would be prudent to provide information about the relationship between job strain and hypertension, as well as advice on how to improve the exposure in the psychosocial work environment.

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