

Is High Job Strain Associated With Hypertension Genesis?

Michel Ducher, Catherine Cerutti, Gilles Chatellier, and Jean-Pierre Fauvel

Background: The aim of this analysis was to test, in a large sample of normotensive subjects, the short-term influence of job strain on the onset of hypertension.

Methods: According to the questionnaire of Karasek et al, job strain was divided into four modalities: (high strain, low strain, passive, and active) based on job demand (eg, the need to work hard and quickly) and job latitude (eg, control over skill use, time allocation, and organizational decisions) scores. High strain (HS) was defined by a high demand and a low job decision latitude. Individual data obtained in 926 (age 41 ± 6 years) healthy normotensive or newly diagnosed hypertensive subjects were analyzed. Subjects participated in two prospective work site surveys designed to assess the influence of job strain on hypertension development. Relationships between job strain modalities and work site blood pressure (BP) levels were assessed using a general linear model. A complementary analysis using the the Pearson Φ coefficient (Z analysis) was implemented to explore nonlinear or

scattered relationships between job strain and onset of hypertension.

Results: Systolic BP (SBP) was linearly related significantly to BMI and alcohol consumption, whereas diastolic BP (DBP) was related to age. The linear model did not find any relationship between SBP or DBP and job strain modalities. Using the Z analysis, development of systolic hypertension (SBP >140 mm Hg) was significantly associated with high job strain ($P < .001$).

Conclusions: Our results suggest that there is no global relationship between job strain and BP levels. However our methodology revealed a significant association between job strain and work site BP in a predominantly male subgroup of newly diagnosed hypertensive subjects exposed to high job strain. Am J Hypertens 2006;19: 694–700 © 2006 American Journal of Hypertension, Ltd.

Key Words: Job strain, stress, cardiovascular risk factor, statistical dependence.

Psychosocial factors have been repeatedly associated with an increased risk of cardiovascular disease. Among psychosocial factors, job strain has mostly been evaluated using mainly the Job Demand–Control (JD-C) model^{1–3} and the Effort–Reward Imbalance (ERI) model.^{1,2,4} Job strain has been repeatedly associated with an increased risk of cardiovascular disease in both men and women.^{1–7} However the effect of job strain on blood pressure (BP) is still subject to debate.^{8–19} Most but not all cross-sectional or short-term studies report that subjects exposed to high job strain have higher BP or heart rate (HR). At a 3-year interval, in the few subjects chronically exposed to high job strain, Schnall et al reported a persistent effect of high job strain on ambulatory BP.²⁰ In the long run, however, a relationship between job strain⁸ or “feelings about work environment”¹⁹ and BP was not found. Suspected physiologic effects of job strain that could increase BP include mainly sympathetic pathways^{14,21} and pituitary–adrenocortical hormones,^{22–24} a highly deleterious combination.⁶ Dis-

crepancies between studies might be caused by population sampling, study design, follow-up duration, or BP recording.^{6,7} One of the most confusing factors might be the intra-individual variability of job strain with time. Because job strain varies with time, its effect on BP is difficult to evaluate. To study the influence of job strain on BP, both job strain and BP should be simultaneously recorded. Furthermore, if job strain is related to BP, very little is still known about the effect of job strain on the onset of hypertension, which is the most relevant clinical outcome. In this analysis, we have pooled data from two studies that simultaneously recorded BP and job strain status both in normotensive subjects and in those with newly diagnosed hypertension.

Subjects and Methods

Subjects

The analysis was conducted in 926 healthy subjects (men and women) included in two studies (mean age 41 ± 6

Received June 22, 2005. First decision December 28, 2005. Accepted December 29, 2005.

From the Département de Néphrologie et Hypertension, UMR MA 103 Hôpital E. Herriot, 69437 Lyon, France (MD), J-PF, EA 3740, Université Claude Bernard, Lyon, France (CC), Département

d’Informatique Hospitalière, Hôpital Européen Georges Pompidou, 20, rue Leblanc, 75015 Paris, France (GC).

Corresponding author Prof. Jean-Pierre Fauvel, Département de Néphrologie et Hypertension Artérielle, Hôpital E. Herriot, 69437 Lyon Cedex 03 France; e-mail: jean-pierre.fauvel@chu-lyon.fr

years). Both studies were prospective and aimed to analyze the influence of job strain on BP in working populations. The two studies shared the same inclusion criteria. All subjects included in this analysis were found to be normotensive (BP <140/90 mm Hg) on the previous mandatory annual work site examination. Inclusion criteria included normal findings on a full clinical examination, normal results of a dipstick urine analysis, and no use of medication known to interfere with BP.

The first study was a prospective cohort study that aimed to quantify hypertension prevalence and 1-year incidence in healthy workers. Physicians from various work environments (eg, manufacturing, service industries, or transportation, with the exception of the agricultural sector) participated in the study. All subjects signed an informed consent at inclusion. One year later, all incident hypertensive subjects were included in the ancillary job strain substudy. Each hypertensive (203 cases, BP \geq 140/90 mm Hg) was matched according to age (\pm 10 years) and sex with two normotensive subjects (406 controls subjects, BP <140/90 mm Hg) attending the visit immediately afterward. Matching was successful. None of the 609 normotensive or hypertensive volunteers refused to fill out the questionnaire; however 14 questionnaires were incompletely filled out and thus not used in the analysis.

The second study was conducted in subjects employed full-time in a chemical company. With the use of a register, 473 normotensive subjects were eligible for the study. Among them, 370 volunteered to participate in the study that included a job strain questionnaire. Of these, 317 fulfilled the inclusion criteria and provided signed informed consent. At the inclusion visit, 282 were still normotensive, whereas 35 were newly diagnosed hypertensive subjects. In this study, seven questionnaires were incompletely filled out and therefore not used in the analysis.

Because the two studies shared the same main objective, were realized in normotensive (at baseline) working populations by work site physicians, and used the same questionnaire to classify job strain, individual data were pooled. The first and the second studies were approved by the Comités de protection des personnes dans la recherche Biomédicale of Grenoble and Lyons respectively.

Analysis of BP

In both studies, sitting BP measurements were taken by work site physician during working hours in the work place. In both studies, work site BPs were measured three times after a 5-min rest using a cuff appropriate for arm size. The average of the last two of the three BP measurements was considered. In the first study, a training session was organized for all work site physicians to standardize BP measurements using an OMRON 705 CP (OMRON, Matsusaka Co Ltd., Japan). In the second study, BP was measured by one trained physician using a mercury sphygmomanometer. Four systolic BP (SBP) and four

diastolic BP (DBP) levels were defined as follows for the analysis of dependence between events: low normal (SBP <100 mm Hg or DBP <70 mm Hg); normal (SBP 100 to 119 mm Hg, or DBP 70 to 79 mm Hg), pre-hypertensive (SBP 120 to 139 mm Hg, or DBP 80 to 89 mm Hg); and hypertensive (SBP \geq 140 mm Hg or DBP \geq 90 mm Hg).

Psychosocial Factors

The “job contents questionnaire” developed by Karasek et al³ can be characterized as focusing on the psychologic and social structure of the work situation: issues relevant to work demands, decision-making opportunities, social interactions. Physical aspects of work are also measured but in a very general manner.

Karasek et al³ argued that work stress results from the combined effects of the demands of a work situation and the range of decision-making freedom (latitude) available to the worker facing those demands. Decision latitude is an operationalization of the concept of control and has often been defined as the combination of job decision-making authority and the opportunity to use and develop skills on the job. The “job strain” model states that the combination of high job demands and low job decision latitude will lead to negative physical health outcomes such as hypertension and cardiovascular disease. In our study, each subject completed a French-language version of the self-administered questionnaire packet developed by Karasek et al, which included 14 items to assess job demand and job decision latitude.³ The job strain questionnaire used was a translation of the job contents questionnaire. The translation had been performed in 1993 by psychologists, sociologists, work site physicians, and stress specialists. A reverse translation was made to assess the quality of the French translation. The questionnaire is very close to the Canadian version that was fully validated by Larocque et al.²⁵ Median values of demand (median value = 31) and latitude (median value = 64) divided the subjects into four

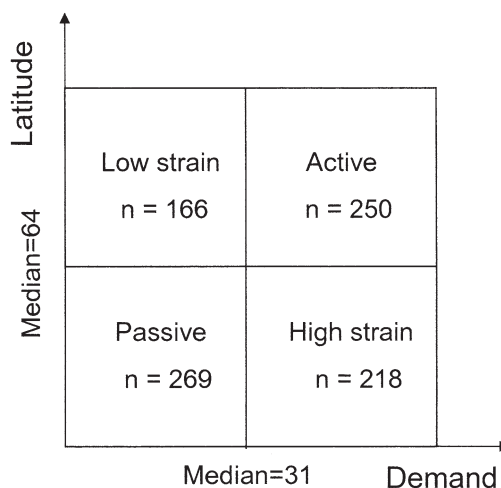


FIG. 1. Definition of job strain modalities as a function of job demand and job decision latitude.

Download English Version:

<https://daneshyari.com/en/article/2862889>

Download Persian Version:

<https://daneshyari.com/article/2862889>

[Daneshyari.com](https://daneshyari.com)