Workplace justice and psychosocial work hazards in association with return to work in male workers with coronary heart diseases: A prospective study

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Dear Editor

Psychosocial job stressors, such as high job demands, low control, and effort–reward imbalance, have been linked to higher risks of coronary heart disease (CHD) in a meta-analysis of many epidemiological studies [1]. In recent years, work-related CVD, with clinical presentations of cardiac arrhythmia, CHD, atherosclerosis or sudden cardiac death, have gained growing attention in Taiwan and its neighboring countries, such as Japan and Korea where long working hours and high stress at work are commonplace [2]. On the other hand, the effects of psychosocial work characteristics on return to work (RTW) among CVD patients also deserve attention since it is the most frequent cause of illness and disability with regard to work after musculoskeletal and mental ill health [3].

Whether the progresses in clinical treatment improve patients’ likelihood to return to work has not also been well evaluated. It was noted that the risk of recurrent CVD is two-fold when follow-up is longer than 2 years [4] and more chance of death if returning on the prior job before the first myocardial infarction [5].

We thus design a prospective study to examine the impacts of psychosocial work hazards on RTW at 12 months following the first onset of acute myocardial infarction (AMI) or severe CHD in a tertiary hospital in Taiwan. Study subjects were classified as three groups: AMI (group 1), severe CHD either receiving bypass graft (group 2) or percutaneous old balloon angioplasty and stent (POBAS) (group 3),

Table 1

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>AMI</th>
<th>CHD s/p CABG</th>
<th>Severe CHD s/p POBAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>47.82 ± 7.98</td>
<td>50.53 ± 6.16</td>
<td>49.31 ± 6.08</td>
</tr>
<tr>
<td>Min–max</td>
<td>22.73–60.70</td>
<td>31.60–59.44</td>
<td>31.64–59.86</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>26.18 ± 3.55</td>
<td>26.40 ± 3.46</td>
<td>26.77 ± 3.35</td>
</tr>
<tr>
<td>Waist, cm</td>
<td>90.65 ± 9.02</td>
<td>91.12 ± 9.05</td>
<td>90.78 ± 8.08</td>
</tr>
<tr>
<td>Smoking habit</td>
<td>Current, %</td>
<td>72.26%</td>
<td>45.90%</td>
</tr>
<tr>
<td>Ex-, %</td>
<td>9.49%</td>
<td>14.75%</td>
<td>29.46%</td>
</tr>
<tr>
<td>Alcohol habit, %</td>
<td>24.26%</td>
<td>16.67%</td>
<td>16.28%</td>
</tr>
<tr>
<td>Hypertension, %</td>
<td>46.72%</td>
<td>59.02%</td>
<td>54.26%</td>
</tr>
<tr>
<td>Diabetes, % (by history)</td>
<td>20.44%</td>
<td>32.70%</td>
<td>19.38%</td>
</tr>
<tr>
<td>Fasting glucose, mmol/L</td>
<td>6.02 ± 1.89</td>
<td>6.01 ± 1.33</td>
<td>5.95 ± 1.95</td>
</tr>
<tr>
<td>Hemoglobin A1C, %</td>
<td>63.2 ± 1.51</td>
<td>63.9 ± 1.20</td>
<td>6.16 ± 1.36</td>
</tr>
<tr>
<td>Gout, %</td>
<td>18.25%</td>
<td>18.03%</td>
<td>26.36%</td>
</tr>
<tr>
<td>Cholesterol, mmol/L</td>
<td>4.84 ± 1.20</td>
<td>4.77 ± 1.30</td>
<td>4.90 ± 1.01</td>
</tr>
<tr>
<td>Triglyceride, mmol/L</td>
<td>2.07 ± 1.18</td>
<td>2.44 ± 0.94</td>
<td>2.21 ± 0.71</td>
</tr>
<tr>
<td>LDL, mmol/L</td>
<td>1.39 ± 0.37</td>
<td>1.39 ± 0.37</td>
<td>1.39 ± 0.37</td>
</tr>
<tr>
<td>HDL, %</td>
<td>58.62%</td>
<td>57.54%</td>
<td>54.11%</td>
</tr>
<tr>
<td>Dyslipidemia, %</td>
<td>65.69%</td>
<td>77.05%</td>
<td>58.14%</td>
</tr>
</tbody>
</table>

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☆☆ Contribution of this study: Dr. Du writes the manuscript and together with Drs. Cheng, Hwang and Chen takes responsibility for all aspects of the reliability and freedom from bias of the data presented and their discussed interpretation; and Dr. Su designs the study and completes the whole study and follow-up, and also takes responsibility for all aspects of the reliability and freedom from bias of the data presented and their discussed interpretation.
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who were recruited from the Division of Cardiology of the National Taiwan University Hospital (NTUH). This study was approved by the Institutional Review Board of NTUH. Informed consent was obtained from each participant at the time of enrollment. The author(s) of this manuscript have certified that they comply with the Principles of Ethical Publishing in the International Journal of Cardiology.

Vascular risk factors and clinical information were also recorded from detailed chart review and blood test at the recruitment (before discharge or within 2 weeks after discharge), and at the 4th and the 12th month after disease onset. Status of RTW was recorded at the 4th and the 12th month.

The Chinese version of Job Content Questionnaire (JCQ) including 22 items was applied. Also included in the questionnaire was a modiﬁcation of the original standard questionnaire [6] and showed good psychometric properties that justify their use. Information on other work-related factors, such as work hours, physical job demands, shift work, irregular duties, frequent job changes, frequency of business travel, etc., was also obtained.

The associations between work-related factors and the risk of return to work were examined by multivariate logistic regression analysis with adjustment of cardiovascular risk factors and related psychosocial characteristics, using SAS statistical software (version 8.2 SAS Institute Inc, Cary NC, USA). The statistical signiﬁcance level was set at 0.05 for the study.

From Jan 2008 through Nov 2011, 327 male patients, 23–60 years of age were enrolled in this study. Ninety percent of patients returned to work less than 4 months. Basic demographic and biochemical proﬁles of the three groups of patients were shown in Table 1. There were differences in age distribution, current smoking, past stroke history and dyslipidemia status. Comparison between the successful RTW and non-RTW patients showed that the former has a higher percentage of education level (≥12 years), fixed employment relationship, higher scores in work control and workplace justice, and was more likely to have low job strain and less physical job demands. The regression analyses (Table 2) showed that the workers with high demands and low control job were more likely to have an unsuccessful RTW (OR (95% CI) = 2.70 (1.16–6.28), p < 0.05) as compared to those in other three quadrants of the job strain model, while lower levels of workplace justice signiﬁcantly decrease the likelihood of successful RTW (OR = 0.20, p < 0.01) but not clinical factors. On the other hand, although work control or job strain was signiﬁcantly associated with return to work, when combining both workplace justice and work strain in the same model for multivariate analysis, workplace justice but not work strain remained a strong negative predictor of unsuccessful RTW in CHD patients, with an odds ratio (95% CI) of 0.24 (0.08–0.73).

Since working stress has been noted to be associated with CVD and chronic job strain associated with poor long-term prognosis after a first myocardial infarction, it is reasonable to postulate that RTW for CHD patients poses a certain degree of psychological stress. Following conceptual and empirical development, workplace justice was constructed and correlated with many health outcomes, including willingness to work [7], or metabolic syndrome [8]. In a Finland longitudinal study, low decision-making (procedural) justice may produce 41% increase risk of sickness absence, even controlling for work demand and control [9]. It is also noted that organizational justice is associated with higher job strain [10], which could subsequently interplay with other cardiovascular risk factors.

In conclusion, this study employs a hospital-based sample and a prospective design, which were adjusted for a set of clinical and psychological conditions. Among all these variables, the adjustment for the baseline workplace injustice makes the results particularly robust. We conclude that the ﬁndings add to the sparse literature speciﬁcally assessing the impact of psychosocial work conditions on the return to work process.

References

Low density lipoprotein-containing circulating immune complexes have better prognostic value in carotid intima-media thickness progression than other lipid parameters

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Dear Editor,

It has been shown by earlier studies that increased level of LDL-containing circulating immune complexes (LDL-CIC) possesses high diagnostic significance in clinically manifested atherosclerosis [1,2] but still little is known about its prognostic significance in preclinical atherosclerosis. It can be suggested that LDL-CIC may play a significant role in atherogenesis as they can induce massive cholesterol accumulation in cultured vascular cells [3]. The recent Epidemiology of Diabetes Interventions and Complications (EDIC) Trial has revealed that cholesterol and apo B content of immune complexes were significantly higher in diabetic patients who showed progression of the internal carotid intima-media thickness (IMT) than in those who showed no IMT progression, regression or mild progression [4,5]; cholesterol content of immune complexes was a significant positive predictor of internal carotid IMT progression in Type 1 diabetes mellitus [4,5].

We have performed a two-year prospective study in 101 asymptomatic men; informed consent was obtained from each study participant. The study protocol conformed to the ethical guidelines of the 1975 Declaration of Helsinki and was approved by the institution’s ethical committee. The level of LDL-CIC in serum at the baseline was measured by enzymatic method after CIC precipitation with polyethylene glycol 6000 [1]. The levels of total cholesterol, triglycerides, HDL and LDL cholesterol were measured using commercial enzymatic kits. Ten-year prognostic risk of CHD development was calculated according to Weibull model derived from the results of Framingham study [6]. Ten-year prognostic risk of fatal or non-fatal myocardial infarction and sudden death was calculated with Cox proportional hazards model derived from PROCAM study [7]. The primary endpoint was the progression of mean intima-media thickness of common carotid arteries (cIMT) measured by high-resolution ultrasonography [8]. Individual dynamics of cIMT over a two-year follow-up was classified as progression, regression either stability on the basis of statistically significant difference of the mean of three consecutive ultrasonographic examinations at the end of the study from the mean of three consecutive examinations at the baseline.

The analysis of contingency of serum lipids, LDL-CIC and 10-year prognostic risks of CHD and myocardial infarction with IMT increase for two years of the follow-up has shown that only LDL-CIC but not any other examined parameter was contingent with cIMT progression (p=0.042). The area under the ROC-curve, when endpoint cIMT progression was taken as an actually observed state, was 0.781 (95% CI, 0.686–0.875, p<0.001) for LDL-CIC, with 75.5% sensitivity, and 71.2% specificity. On the opposite, all other estimated parameters did not possess statistically significant prognostic values.

The area under ROC-curve was 0.539 (95% CI, 0.426–0.653, p=0.5) for total cholesterol, 0.522 (95% CI, 0.408–0.635, p=0.7) for triglycerides, 0.576 (95% CI, 0.463–0.688, p=0.19) for LDL cholesterol, 0.403 (95%CI, 0.290–0.516, p=0.09) for HDL cholesterol. Calculated prognostic risks based on estimation of several convenient risk factors including lipid parameters also did not possess prognostic significance with the respect to cIMT progression over two years of follow-up: the area under ROC-curve was 0.524 (95% CI, 0.410–0.637, p=0.7) for 10-year prognostic risk of fatal or non-fatal myocardial infarction or sudden death, and 0.510 (95% CI, 0.396–0.624, p=0.9) for 10-year prognostic risk of CHD.

Thus, the results of the present study demonstrate that LDL-CIC may be employed as a novel marker of early atherosclerosis and may possess a sufficient prognostic value for clinical implications.

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