

Original Article

Effects of psychological stress on lipid profiles of patients

Sandeep Tripathi

Assistant Professor, Department of Biochemistry, National Institute of Medical Science & Research, Jaipur, Rajasthan, India

ABSTRACT:

Introduction: The association between high serum cholesterol level, especially high LDL-C and coronary artery disease (CAD) is casual and independent of other risk factors. This study was conducted to determine the effects of psychological and physical stress on lipid profiles of patients. **Materials and Methods:** It comprised of 140 subjects of both genders. A thorough clinical examination was done. A detailed questionnaire containing questions on health, diet, smoking, drinking habits and lifestyle was recorded. Laboratory investigations such as weight, height, waist circumference, hip circumference, ECG and BMI were done. 5 ml of fresh 12 hour fasting venous sample was collected by venopuncture after inserting dwelling cannula for assessing lipid profile and other routine investigation like Hb, TLC, DLC, FBG and RBG. Lipid. **Results:** that there were 60 subjects of high stress and 30 of low stress with TG >200, 50 subjects and 35 of high and low stress respectively with TC >240, 40 high stress and 38 low stress with LDL > 160 and 30 males and 20 females with HDL >40 and 50 respectively. The difference was significant (P < 0.05). **Conclusion:** Psychological stress was a risk factor for lipid disorders, and proper physical activity was protective in this situation. One of the physical activities is work activity; work activity without stress could be harmless and useful. However, psychological stress could be eliminated in the workplace.

Keywords: psychological stress, lipid profiles, serum cholesterol

Corresponding author: Sandeep Tripathi, Assistant Professor, Department of Biochemistry, National Institute of Medical Science & Research, Jaipur, Rajasthan, India

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INTRODUCTION

It is the most important risk factor responsible for the genesis of atherosclerosis leading to coronary heart disease, cerebral vascular disease and peripheral vascular disease. Lipid disorders are prevalent in the world. Some of their risk factors are modifiable such as mental and physical stresses. The main etiology of lipid disorders is genetic factor and family history that is not changeable.¹ In psychological sciences, stress is a feeling of mental press and tension. Low levels of stress might be desired, useful, and even healthy.² Stress, in its positive form, can improve biopsychosocial health and facilitate performance. Furthermore, positive stress is considered as an important factor to motivation, adaptation, and reaction to surrounding environment. However, high levels of stress could result in biological, psychological, and social problems and even serious harms to people.³ Stress may be either external with environmental source, or caused by internal perceptions of the individual. The latter form, in turn can produce anxiety, and/or other negative emotions and feelings such as press, pain, sadness, etc., and result in serious psychological disorders such as post-traumatic stress disorder (PTSD).⁴ Cardiovascular diseases (CVD) are recognized as important threats to human health. It is the leading cause of death. Blood lipids are influenced by nutrition, body weight, physical activity, medications and genetic factors. Evidence suggests that blood lipids are also affected

by mental status.⁵

Other researcher showed the cardiovascular disease and its risk factors in law enforcement personnel.⁶ Another study demonstrated the association between job stress and combined dyslipidemia among workers.⁷ There are also some studies about the dyslipidemias in female law enforcement officers and railway workers, and male aircrew personnel.⁸⁻¹⁰

The association between high serum cholesterol level, especially high LDL-C and coronary artery disease (CAD) is casual and independent of other risk factors. This study was conducted to determine the effects of psychological and physical stress on lipid profiles of patients.

MATERIALS & METHODS

All involved patients were informed regarding the study and their written consent was obtained. It comprised of 140 subjects of both genders. A thorough clinical examination was done. A detailed questionnaire containing questions on health, diet, smoking, drinking habits and lifestyle was recorded. Laboratory investigations such as weight, height, waist circumference, hip circumference, ECG and BMI were done. 5 ml of fresh 12 hour fasting venous sample was collected by venopuncture after inserting dwelling cannula for assessing lipid profile and other routine investigation like Hb, TLC, DLC, FBG and RBG. Lipid.

The researcher determined the stress level according

to work environmental scale and modified standard stress scale. By using of blood examinations were done in periodic examinations the relation between the job risks and lipid profiles were showed. For statistical analysis, data were analyzed with

SPSS 16. χ^2 , exact test, ANOVA, and regression were used to compare qualitative and quantitative variables, *P*-value less than .05 was considered for significant levels and relative risks were calculated with confidence interval 95%.

RESULTS

Table 1 shows that there were 60 males and 80 females in present study.

Table I: Distribution of patients

Total- 140		
Gender	Male	Female
Number	60	80

Table 2 shows that there were 60 subjects of high stress and 30 of low stress with TG >200, 50 subjects and 35 of high and low stress respectively with TC >240, 40 high stress and 38 low stress with LDL > 160 and 30 males and 20 females with HDL >40 and 50 respectively. The difference was significant (*P*<0.05).

Table 2: Dyslipidemia associated with stress level

Lipid (mg/dl)	Value	High stress	Low stress	P value
TG	>200	60	30	0.04
	<200	30	40	
TC	>240	50	35	0.02
	<240	40	35	
LDL	>160	40	38	0.01
	<160	50	32	
HDL	Male >40	30	20	0.05
	Female >50	30	12	
	Male <40	22	18	
	Female <50	18	30	

DISCUSSION

Of all dietary constituents, the amount and composition of fatty acids and the amount of cholesterol seem to be the most important modulators of serum lipid and lipoprotein metabolism, and therefore have been targeted in dietary recommendations aimed at reducing lipoprotein levels and CAD risk.¹¹ Humans experience higher total or fractional cholesterol around laboratory stress sessions, compared to rest periods or control groups. Stress hormones even correlate directly with serum lipids, in some research. Many biological mechanisms could explain this positive relationship between stress hormones and lipids. Individuals deemed high stress reactors (based on stress hormone levels) even had higher cholesterol at three-year follow-up, as well as greater central adiposity.¹² This study was conducted to determine the effects of psychological and physical stress on lipid profiles of patients.

In present study, there were 50 males and 70 females. A study demonstrated the association between job stress and combined dyslipidemia among workers. Effort, over commitment and low reward increased the risk of dyslipidemia among Chinese workers, and they were significantly associated with TG and LDL-C rather than TCHO or HDL-C. Increasing blood lipids may be the possible link between job stress and coronary heart disease.¹³

We found that there were 50 subjects of high stress and 20 of low stress with TG >200, 40 subjects and

25 of high and low stress respectively with TC >240, 30 high stress and 28 low stress with LDL > 160 and 20 males and 10 females with HDL >40 and 50 respectively. A study showed lipid disorders in people with jobs that had psychological stress. Subjects with a higher level of perceived demands had higher levels of CHOL, LDL/HDL and TG and lower levels of HDL-c. In response to the respite, subjects experiencing more demands showed a greater decrease of LDL-c (*P*<.01) and LDL/HDL (*P*<.001). Sex moderated these stress-related respite effects for HDL-c (*P*<.01) and LDL/HDL (*P*<.005), high demand males showing a smaller decrease in HDL and a greater decrease in LDL/HDL than females in response to the respite.¹⁴ Shahnam¹⁵ conducted a study in which blood samples were taken to determine the lipid levels including total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), low levels of high-density lipoprotein cholesterol (HDL-C) and triglycerides. Stress levels were assessed using the General Health Questionnaire. Logistic regression and chi-square tests were used for statistical analysis. The odds ratios of high stress in individuals with high levels of TC, LDL-C and low levels of HDL-C compared to normal individuals after adjustment for age and sex were as follows respectively: 1.05 (1.02,1.15), 1.06 (1.02,1.18), 1.06 (1.01,1.17).

In other study was demonstrated the emotional effects on wellbeing of office workers.¹⁶

In this research there were not have exact job analysis

for other occupational hazards and it was a limitation for this study. The author of this article recommended to the people with psychological stress to have a regular physical activity in the daily program and modifying the psychological stress by consultation with a psychologist. Job stress or chronic stress had unsuitable effects on workers' health and occupational medicine specialist must be had attention to this.^{17,18}

Psychological stress could be resulted from personal conflict, social and family problems, and working. Considering the importance of mental health on wellbeing, the author recommends the job modification in working situations.

CONCLUSION

Authors found that there is more dyslipidemia in stressful patients as compared to non stress one. Dyslipidaemia is a modifiable CVD risk factor. Psychological stress was a risk factor for lipid disorders, and proper physical activity was protective in this situation. One of the physical activities is work activity; work activity without stress could be harmless and useful. However, psychological stress could be eliminated in the workplace.

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