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A study to examine association of personality factors of essential hypertension and diabetes

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Abstract
The present paper deals a study to examine association of Personality factors of essential hypertension and diabetes. Recent researches have shown that hypertension is an important risk factor for the development of cardiovascular and cerebrovascular diseases and a major cause of end stage renal disease. Its prevalence generally increases with age. Cardiovascular risk factor is a condition that is associated with an increased risk of developing cardiovascular disease. Psychosocial factors, including Type-A personality, anger hostility and anxiety, have been implicated in the pathogenesis of cardiovascular disease.

Keywords: examine, personality factors, hypertension, diabetes

1. Introduction

Researchers have tested the hypothesis that in normal humans, Type-A personality characteristics are associated with exaggerated heart rate, blood presser and sympathetic nerve responses to mental and physical stress. They measured heart rate, blood pressure and muscle sympathetic nerve activity at rest and during stress in healthy normal subjects and concluded that abnormalities in sympathetic or cardiovascular reactivity were unlikely to be implicated in any excess of cardiovascular disease in people with Type A personality characteristics (Schroeder *et al.*, 2000) [1].

Recently, researches have shown that personality factors of Negative Affectivity (NA) and Social Inhibition (SI) are of special interest in the above context. (Denollet, 2000) [2]. Negative affectivity (NA) denotes the stable tendency to experience negative emotions (Watson & Friend, 1969) [3]. High Negative Affectivity (NA) individuals experience more feelings of dysphoria, anxious apprehension and irritability across time and situations (Wilco, *et al.* 2007) [4].

Denollet and Conraas (2011) [5] have discussed the Type D personality and vulnerability to adverse outcomes in heart disease in detail. General distress, shared across depression, anxiety and anger partly account for the link between mind and heart. The Type D (distressed) personality profile identifies individuals who are particularly vulnerable to the adverse effect of general distress. Type D individuals frequently experience negative emotions and are socially inhibited. This profile is more stable than that associated with episodes of clinical depression and describes the chronic nature of distress in some patients. Type D may also partly account for the effect of emotional distress on cardiac prognosis. Type D is associated with a threefold increased risk of adverse cardiovascular outcomes, even after adjustment for depression.

Their initial objective was to relate the Fear of Negative Evaluation variable, for which they used the FNE and SAD questionnaires, with the TABP. A preliminary analysis of the data obtained indicated that the overall TABP does not relate to fear of negative evaluation as measured on both scales. Nevertheless, results were not the same when it comes to analyzing the different TABP components separately, in agreement with other studies (De la Fuente and De la Fuente, 1997) [6]. This would support the idea maintained over years, that the overall TABP does not seem to relate significantly with certain variables, whereas some of its components do, as the data from the above study demonstrated. Differences were found between men and women in terms of which TABP components relate to fear of negative evaluation. In male subjects, all the TABP components were found related to a certain extent with fear of negative evaluation variable as evaluated using the FNE questionnaire, but when it is evaluated using the SAD questionnaire they found no significant relationships with the excessive workload component. In the case of female subjects, only two of the TABP components were found to relate to Fear of Negative Evaluation: i.e., impatience and hostility. Subsequently, the researchers did a more detailed analysis, in an attempt to see which TABP components were good predictors for fear of negative evaluation as measured on both scales. In men using the FNE questionnaire, the TABP components shown to be appropriate predictors were competitiveness and hostility. On the SAD questionnaire, the only component shown to be a good predictor was competitiveness. With this variable they found a negative relationship on both questionnaires. In women, the only TABP component that predicted fear of negative evaluation on both questionnaires was impatience. Finally, the data from the above study demonstrated that different components are related to fear of negative evaluation; especially some more than others. This relationship was found as more prevalent in men than in women.

Hence, the research data suggested that the Type A Behavior Pattern construct might be related to elements which might threaten self-esteem. Future studies may confirm which of the

known factors are better predictors for coronary disease, and if they should be enhanced with others. The data further suggested that with respect to the TABP further research is necessary to analyze its relationship to other variables and that FNE could be a variable to take into account. In the present research study the Type D personality factors have been taken for the above purposes.

2. Objectives

The major objectives of the present study were

1. To investigate if there were any overall significant differences in the Type of Behaviour Patterns (Type A Vs Type B) and Personality Factors associated with CHD and diabetes (i.e. Type D Personality factors – Negative Affectivity and Social Inhibition) among hypertensives, diabetics and normal (healthy) individuals/subjects.
2. To find out the significance of differences between Type A Vs Type Diabetic patients with regard to Negative Affectivity (NI) the personality Factor of Type D Personality.

3. Hypotheses

On the basis of the trends reported earlier the following null-hypothesis were formulated. It was hypothesized:

(H-1) That there would be no significant difference in the prevalence of Negative Affectivity (NA) among Normal, Diabetic and Hypertensive subjects of Type A Vs Type B Personality.

(H-2) That there would be no significant difference in the prevalence of Social Inhibition (SI) among Normal, Diabetic and Hypertensive subjects of Type A Vs Type B personality.

4. Methodology

The present research was conducted on 200 subjects of 40 to 60 years of age. Out of these total 200 subjects 100 were normal/healthy (Control), whereas, out of the remaining 100 subjects half (50) were the patients of Essential Hypertension and half (50) were the patients of Diabetes Mellitus (Diabetes Type II). The selection of cases for the sample was done from amongst both male as well as female out patients taking regular treatment from doctors of different nursing homes/hospitals at Rewa. And the normal/control subjects were selected from amongst the common people of Rewa city. The selection of the subjects in both the above categories i.e. (Control and Experimental) was done on atrandom purposive basis without any preferences whatsoever. All the subjects were from middle class and educated background. Half of the subject in each category were males and half were females.

5. Results and Discussion

Table 1 and Figure 1 present the elementary statistical analysis of the data regarding Mean (M) and Standard Deviation (SD) of Negative Affectivity (NA) and Mean and SD of Social Inhibition (SI) Subscale Scores of DS14 Scale/and Type A Vs Type B Behaviour Patterns/Personality of Subjects of (i) Normal (Control), (ii) Diabetic and (iii) Hypertensive Categories. The average Negative Affectivity (NA) Score of Type A Control Subjects (M=16.14, SD = 3.56) was more or less equal to that of Type B Control Subjects (M=16.35; SD = 3.76). Similarly, the average Social Inhibition (SI) Score of Type A control Subjects (M=12.85; SD=4.28) was also more or less equal to that of the Type B control Subjects (M=12.76, SD=3.62). Thus, the findings shown in the extreme left section of the Table 1 indicate that there was hardly any difference in between the Negative Affectivity (NA) and Social Inhibition (SI) characteristics of the normal/control Subjects regardless of whether they were predominantly of Type A or Type B personality.

But the picture looks entirely different than the above when the middle section of Table 1 is perused. Here, in the case of Diabetic Subjects, the Mean Negative Affectivity (NA) Score of Type A Subjects (M=16.18; SD=7.12) was quite high than of Type B Subjects (M=11.78; SD = 4.26). Similarly, in Social Inhibition (SI) too the Type A Diabetic Subjects showed higher scores (M=14.74; SD = 5.50) than that of the Type B Subjects of the same Subjects category (M=12.87; SD = 3.96). Thus, in the case of Diabetic Subjects it appears that Type A Subjects showed more Negative Affectivity (NA) as well as more Social Inhibition (SI) as compared to their Type B counterparts. Thus, the Diabetic Subjects of Type A Personality showed greater degree of Type D Personality characteristics than their Type B counterparts.

The third the extreme right section of Table 1 throws light on the above aspects with regard to the Hypertensive Subjects. Here the findings appear to show a reverse trend so far as Negative Affectivity (NA) is concerned. Hypertensive Type A Subjects showed relatively lesser Negative Affectivity (M=14.73; SD=4.46) than their Type B counterparts (M=16.08; SD=-3.62), whereas, there was hardly any difference in their Social Inhibition (SI) Scores (For Type A M=11.38; SD=3.60 and For Type B M=11.96; SD = 4.55).

Thus, the three sections of the Table 1 and Figure 1 show three different patterns of NA and SI for the three categories of Subjects. For Normal/Control Subjects Negative Affectivity (NA) and Social Inhibition (SI) characteristics/traits of Type D personality were found in more or less same fashion among both the Type A and Type B Subjects. But Among the Diabetics, both Negative Affectivity (NA) and Social Inhibition (SI) were found higher among the Type A than Type B Subjects. Finally, among the Hypertensive Subjects the pattern was more or less reverse than that of Diabetics as far as the Negative Affectivity (NA) characteristic/trait of the Type D personality was concerned. They appeared to be lower in NA from both the Diabetics as well as the Normal/Control Subjects.

Table 1: Showing the Mean (M) and Standard Deviation (SD) of Negative Affectivity (NA) and Social Inhibition (SI) responses of Normal, Diabetic and Hypertensive Subjects and their Personality Type (Type A Vs Type B)

M/ SD/ N	Normal/Control				Diabetic				Hypertensive			
	Type A		Type B		Type A		Type B		Type A		Type B	
	NA	SI	NA	SI	NA	SI	NA	SI	NA	SI	NA	SI
M	16.14	12.85	16.35	12.76	16.18	14.74	11.78	12.87	14.73	11.38	16.08	11.96
SD	3.56	4.28	3.76	3.62	7.12	5.50	4.26	3.96	4.46	3.60	3.62	4.55
N	54		46		27		23		26		24	
∑ N	100				50				50			

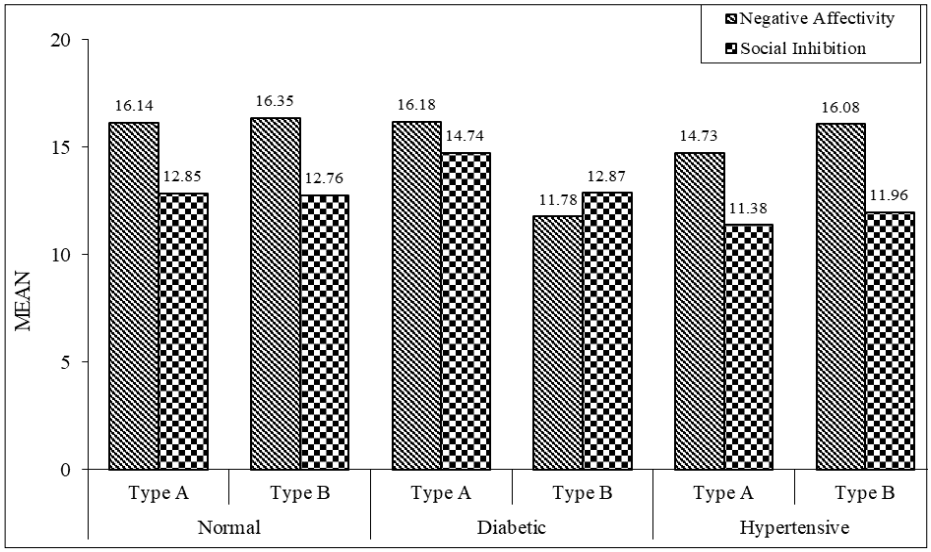

Fig 1: Showing the Means of Negative Affectivity (NA) and Social Inhibition (SI) responses of different categories of subjects (i.e. Normal, Diabetic and Hypertensive) of different personality types (i.e. Type A Vs Type B)

Since the results showed an overall variance among the different treatment conditions of the present study (as shown in Table 1), the data were analysed with the help of Two-way Analysis of Variance (ANOVA).

Table 2 present the summary of ANOVA for the Negative Affectivity (NA) among the Subjects as a function of their type (e.g. Normal/Control, Diabetic and Hypertensive) and their personality type (i.e. Type A Vs Type B) showed that the between treatment variance i.e. the overall variance among the treatment conditions with respect to NA trait/characteristic of Type D personality was found significant ($F=4.03$, $p < 0.01$). Thus, the Hypothesis (H-1) that there would be no significant difference in Negative Affectivity (NA) among the Normal, Diabetic and Hypersensitive Subjects was rejected ($F=4.03$; $p <0.01$). Further, the main effect of Type of Subject was also found significant ($F=3.58$; $p<0.05$). But the main effect of Personality Type was found insignificant ($F=1.07$; $p>0.05$). However, the interaction effect of Type of Subject (Factor X) and Personality Type (Factor Y) was found significant ($F=5.98$; $p<0.01$).

Thus, the ANOVA showed that with regard to the Negative Affectivity (NA) there was a significant difference among the Type of Subjects (i.e. Normal/Control; Diabetics and Hypertensives). Although the Type of Personality i.e. Type A Vs Type B Behaviour Pattern of Subjects did not produce any significant differences in the Negative Affectivity among the Ss. But the significant interaction effect of the Type of Subjects and Type of Personality did indicate that the prevalence of Negative Affectivity (NA) characteristic/ personality traits of Type D personality differed significantly among the three types of the Subjects (i.e. Control, Diabetics and Hypersensitives). The data indicated that Diabetics were higher in this respect at least from the hypertensive Subjects. Thus the first hypothesis (H-1) of the present study was rejected.

Table 2: Showing the Summary of Analysis of Variance (ANOVA) for the Negative Affectivity among the Subjects as a function of their type i.e. Normal, Diabetic and Hypertensive and their Personality Type i.e. Type A Vs Type B.

S. No.	Source of Variance	Sum of Squares (SS)	df	Mean Squares (MS)	F	p
1.	Between Treatments	409.80	5	81.96	4.03	< 0.01***
2.	Main Effect of Type of Subjects (X)	145.26	2	72.63	3.58	< 0.05*
3.	Main Effect of Type of Personality (Y)	21.84	1	21.84	1.07	> 0.05#
4.	Interaction Effect of X.Y	242.70	2	121.35	5.98	< 0.01**
5.	Within Treatments (Error)	3938.20	194	20.30		
	Total	4348.00	199			

* Significant at 0.05 level of significance
*** Significant at 0.01 level of significance
# Insignificant

Table 3 shows the summary of analysis of ANOVA for the Social Inhibition (SI) among the Subjects as a function of their types (i.e. Normal/Control, Diabetics and Hypertensives) and their personality type (Type A Vs Type B). Contrary to the above, the overall variance or between treatment variance among the various treatment conditions with respect to Social Inhibition (SI) was not significantly different ($F=1.84$; $p>0.05$). But, here again the main effect of Type of Subject (Factor X) was found significant ($F=3.32$; $p<0.05$). Once again the Main effect of Type of Personality (Factor Y) was found insignificant ($F=0.43$; $p > 0.05$) and so was the interaction effect (X.Y) between the Type of Subject (X) and Type of Personality (Y) ($F=1.07$; $p >0.05$). Thus, here also the significant difference appeared among the Type of Subjects

(i.e. Normal, Diabetics and Hypertensives) only. Once again the Social Inhibition (SI) Type D characteristics seemed to be higher among the Diabetics than the Hypertensives/and the Control Subjects.

Therefore, the second hypothesis (H-2) of the present study that there would be no significant difference in the prevalence of Social Inhibition (SI) among Normal/Control/Diabetics and Hypertensive Subjects was rejected partially.

Table 3: Showing the Summary of Analysis of Variance (ANOVA) for the Social Inhibition among the Subjects as a function of their type i.e. Normal, Diabetic and Hypertensive and their Personality Type i.e. Type A Vs Type B.

S. No.	Source of Variance	Sum of Squares (SS)	df	Mean Squares (MS)	F	p
1.	Between Treatments	171.16	5	34.23	1.84	> 0.05#
2.	Main Effect of Type of Subjects (X)	123.26	2	61.63	3.32	< 0.05*
3.	Main Effect of Personality Type (Y)	8.04	1	8.04	0.43	> 0.05#
4.	Interaction Effect of X.Y	39.80	2	19.90	1.07	> 0.05#
5.	Within Treatments (Error)	3598.60	194	18.55		
	Total	3769.76	199			

* Significant at 0.05 level of significance
\# Insignificant

The findings of present study revealed that there was a significant difference among different treatment conditions with regard to the Type D personality Traits - Negative Affectivity (NA) and Social Inhibition (SI). The findings that the main effect of type of subjects (Normal /Control/Diabetic/Hypertensive) was significant as well as that the interaction effect of Type of Subject (Normal/Diabetic/Hypertensive) and their type of personality (Type A Vs Type B) with regard to the Negative Affectivity (NA) revealed that the Type D (Distressed) Personality Characteristic/Trait may be significantly associated with the influences of the diseases like Diabetes and/or hypertension as well as their Type of Behaviour Pattern (TABP or TBBP).

Further, the findings of the present research have shown that the Diabetics showed significantly greater amount of Negative Affectivity (NA) – a Type D (Distressed) Personality trait. Previous researches have emphasised the reason why greater number of diabetic patients might develop cardio-vascular disease or can experience a faster progression of such disease.

Moreover, the main effect of type of subjects (Normal/Diabetics and Hypertensives) on the prevalence of Social Inhibition (SI) – another Type D (Distressed) personality trait was found significant. Here again the diabetics showed significantly greater Social Inhibition (SI) than the Hypertensive as well as Normal/Control Subjects. Further, the diabetic patients with Type A personality showed significantly greater Negative Affectivity as compared to Type B Patients. Moreover, Type B Diabetics showed lesser Negative affectivity than Type Normal/Control Subjects. Further Type A Diabetics showed greater Social Inhibition (SI) as compared to Type A Hypertensive patients.

Thus, the results of the present study were supporting to the previous research findings regarding the significant influences of Type of Behaviour Pattern (TABP/TBBP) on the prevalence of Type D personality characteristics. It appeared from the present research that TABP when associated with Diabetes or Hypertension may produce a significant influence on the prevalence of Type D Personality Traits among individuals. This can be a serious cause for the causation and progression of cardiovascular diseases.

The above findings were further supported by the significant positive correlation between TABP and NA among Normal/Control Subjects; significant positive correlations among between TABP and NA among Diabetic patients; and significant positive correlation between TABP and NA among Hypertensive Subjects of the present study.

The above findings were consistent with the views of Denollet (2012), that acceptance by others is a central concern and that threat of negative reactions from other is a main source of psychological stress. People who are high in Social Inhibition have a tendency to inhibit emotion and behaviour in Social situations because of their increase vulnerability to Social-evaluative threats. Type D personality construct-defined as high scores on Social inhibition and negative affectivity - was introduced to study more chronic, covert form of psychological stress. Evidence shows that Type D persobality may have an adverse impact on cardiac prognosis, self management of CVD, Diabetes and Hypertension, adherence to medical treatment etc. (Denollet, 2012) [7].

These findings are consistent with the previous researches reporting that people with higher neuroticism are more prone to experience negative emotions (Lane *et al*. 2000, Blumenthal, 2005) [8-9].

6. Conclusion

The association is almost always a statistical one and so the fact that a person has a particular risk factor merely increases the probability of developing a certain type of cardiovascular disease, it does not mean that he or she is certain to develop heart or blood vessel disease. Conversely, that fact that an individual does not have a particular cardiovascular risk factor (or for that matter any of the known cardiovascular risk factors) does not guarantee protection against heart disease.

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