CHAPTER VII

SUMMARY

Background

Essential hypertension (EH), a psychophysiological disorder is one of the most prominent and prevalent of the cardiovascular disorders affecting 15 to 20 percent of adult population (Griffin & Kee, 1986). Being asymptomatic the disease has been called the 'silent killer' for there are no typical symptoms sending early warning signals as such by the time the symptoms appear the disease has become well established (Davison & Neale, 1990; Mehra & Lashkari, 1992). There is a continuum of cardiovascular risk associated with the level of BP, the higher the BP, the higher the risk of both coronary events and stroke (MacMohan, Peto, Cutler, Collins, Sorlie, Neaton, 1990).

The pathogenesis of essential hypertension (EH) is determined by various factors such as stress, personality and emotional configurations (anger, anxiety, depression). Some studies have documented the role of life events stress in the aetiology and exacerbation of EH (Shah, 1980; Bhargava, Sharma & Aggarwal, 1982; Manuck et al., 1990) However stressful life events literature has provided mixed evidence. Some of studies have failed to find a higher number of stressful life events experienced by the hypertensives (Sevenson & Theorell, 1983; Boyce & Chesterman, 1990; Lazaro et al., 1993). Lal, Ahuja and Madhukar (1982), however, observed higher number of distressing life events in hypertensives when compared to normotensives. Some investigators have also shown that the impact (especially negative) of stressful life events was greater in hypertensives (Shah, 1980; Lal et al., 1982; Sevenson & Theorell,
1983; Ghosh, 1989; Kiecolt-Glaser, Cacioppo, Malarkey & Glaser, 1992; Walker et al., 1994; Uchino et al., 1995; Kamarck et al., 1998). Some studies have also reported specific clustering of life events in EH patients (Bhargava et al., 1982; Canton, 1985; Ghosh, 1989; Blumenthal et al., 1995). In India, a few investigators have studied the relationship of stressful life events and hypertension (Lal et al., 1982; Bhargava et al., 1982; Ghosh, 1989; see also Sharma, 1988).

An overt behavioural syndrome - Type A Behaviour has received support as a risk factor for hypertension/elevated blood pressure (Evans, et al., 1987; Lazaro et al., 1993; Schaubroek, Ganster and Kemmerer, 1994; Peez-Garcia & Sanjuan, 1996; Hendrix and Hughes, 1997; Sharma, Sood, & Spielberger, 1999; Singh & Srivastava, 1999). The particular components of TABP like anger-hostility are being blamed as risk factors of EH (Jamner et al., 1991; Ricci Bitti et al., 1995; Suarez et al., 1998). The other components of TABP frequently emphasized are competitiveness (Peez-Garcia and Sanjuan, 1996; Bermudez and Perez-Garcia, 1996) aggression (Johnson, Myers, Webber, Greenland et al., 1997) and hard driving (Weidner & Matthews, 1978).

Further, the global TABP has been observed to engender high levels of sympathetic arousal to stressful events (Suls and Sanders, 1989). Also the EH patients are found to maintain specific interpersonal clustering (Diamond, 1982; Jem, 1987; Johnson & Spielberger, 1992; Janisse, 1994). The TABP also has some emotional concomitants (Sharma, Sood & Spielberger, 1999) and is reliably associated with chronic dysphoric emotions (Suls & Wan, 1989) Thus, "the behavioural aspects of hypertension include both contributions to causation of this multifactorial disease, and functional and organic consequences of this disorder" (p. 256) (Shapiro & Miller, 1987).
The role of emotional vital signs (anger and anxiety) has long been implicated in the progression of EH. Researchers have confirmed the relationship of anger and anger expression with hypertension (Schneieder et al., 1986; Boutelle et al., 1987; Sharma et al., 1996; Ghosh & Sharma, 1998) and elevated blood pressure (Diamond et al., 1982; Bimsdale et al., 1986; Sommers-Flanagan & Greenberg, 1989). A group of investigators reported that anger proneness was significantly higher in the hypertensives and that they are expected to perceive a wider range of situations as anger provoking (Crane, 1982; Kearns, 1985; Van der Ploeg et al., 1985; Deshields, 1986; Gorkin et al., 1986; Boutelle et al., 1987; Coelho et al., 1989). Research findings show that hypertensives are passive, submissive, unassertive and manifest more anger expression, particularly suppression of anger (Holroyd & Gorkin, 1983; Hartfield, 1985; Jorgensen & Houston, 1986; Jern, 1986; Weiner & Sapira, 1987; Sommers-Flanagan & Greenberg, 1989; Johnson & Spielberger, 1992; Jorgensen et al., 1992; Jorgenson et al., 1996; Vogelle et al., 1997; Ghosh & Sharma, 1998). In contrast, several findings indicate that outward expression of anger is linked to coronary malfunctioning (Men des de Leon et al., 1991) and is associated with elevated blood pressure (Diamond et al., 1984; Vogele & Steptoe, 1993; Siegman, 1993; Schuenkmezger & Hank, 1996; Siegman & Snow, 1997). The association of hostility and styles of anger-expression with EH and CHD has also been provided for (Diamond, 1982; Krantz & Manuck, 1984; Houston, 1988).

Investigators have also documented the role of anxiety in the onset and exacerbation of essential hypertension (see Coelho et al., 1989; Van der Ploeg et al., 1985; Schneider et al., 1986; York et al., 1987; Vogele et al., 1997; Ghosh & Sharma, 1998). The higher scores of the hypertensives on T-Anxiety provide evidence that high anxiety is a concomitant of EH.
(Sharma et al., 1996; Chaudhary, Singh & Bhardwaj, 1994). However, some investigators did not find a strong relation between anxiety and EH/elevated BP (Foster & Bell, 1983; Boutelle et al., 1984; Knight et al., 1987; Santanastaso et al., 1984).

Some investigators have reportedly considered stress (life or occupational) along with negative affectivity in the onset and exacerbation of EH (Cottingham et al., 1986; James, 1987; Johnson et al., 1987; Henry, 1988; Hafner & Miller, 1991; Dressler, 1993).

The paucity of research on TABP and negative emotions vis-à-vis EH/elevated BP is apparent and is mainly due to the paucity of fully standardized cross-cultural measures of TABP, trait-anger, anger coping styles and trait-anxiety. However, the recent availability of State-Trait Anger Expression Inventory: STAXI (Spielberger, 1988) and its Hindi version (Krishna, 1988 and Rana, 1990) can stimulate cross-cultural research on the specific role of chronic anger and its coping in the development of essential hypertension. It is important to study the role of situational variables (like life events stress and its impact) along with personality (TABP) and negative emotions (T-Anger, T-Anxiety) vis-à-vis EH/elevated BP of males or females in a different socio-cultural context. Such a research is likely to validate the findings observed on western samples in a different socio-cultural milieu.

7.1 Objectives of the Study

Main Objective

How do Life Event Stress, Type A Behaviour pattern, T-Anger, T-Anxiety and modes of Anger Expression (AX/In, AX/Out, AX/Con) synergistically influence the pathophysiology of essential hypertension.
Specific Objectives

When compared to surgical/orthopaedic normotensive patient controls, this research will determine:

(i) relative magnitude of the total as well as the negative and positive impact of life events (changes) in EH patients.
(ii) disease-specific clustering of various stressful life events (changes) in EH patients,
(iii) levels of TABP, T-Anger and T-Anxiety in EH patients,
(iv) dominant mode of coping with anger (AX/In, AX/Out, AX/Con) employed by EH patients, and
(v) optimal set of variables (Life Event Stress, TABP, T-Anger, T-Anxiety and modes of Anger Expression which in combination would maximally separate/discriminate EH patients from their normotensive controls.

7.2 Hypotheses

I. The hypertensives would not only report higher number of recent life events (changes) but also their greater impact when compared with their normotensive (surgical/orthopaedic) counterparts.

II. The impact of negative life events (changes) would be greater in hypertensives than their normotensive (surgical/orthopaedic) counterparts. However, no such difference would emerge with respect to positive life events (changes).
III. There would be a disease-specific clustering of recent life events (changes) in EH patients when compared to their normotensive (surgical/orthopaedic) counterparts.

IV. The hypertensives would be higher on Type A Behaviour Pattern (TABP), Trait Anger (T-Anger) and Trait anxiety (T-Anxiety) than their normotensive (surgical/orthopaedic) counterparts.

V. The hypertensives would report greater anger suppression (AX/In) and relatively less outward anger expression (AX/Out) as well as anger control (AX/Con) than the normotensive controls.

VI. A subset of Life Events Stress (negative impact of life changes), TABP, T-Anger, T-Anxiety and Anger Coping Styles (AX/In, AX/Out, AX/Con) in combination would maximally separate/discriminate hypertensives and their matched normotensive counterparts.

7.3 Sample
A cross-sectional design was employed for this comparative study of patients with essential hypertension with BP being used as a categorized variable. The study group comprised of 150 (males: 80; females: 70) non-selected hypertensives and 150 (Males: 80; Females: 70) non-selected normotensive (surgical/orthopaedic) patient controls visiting the out-patient clinic of Indira Gandhi Medical College/Hospital (IGMC), Shimla. The patients ranged in age from 40 to 65 years. The hypertensives were aware of their disease status and were on antihypertensive medication. All of them were middle class and had at least a high school
education. None suffered from any cardiovascular disease or any secondary complications.

7.4 Tools used

i) Life Stress Scale (Ghosh, 1992).

ii) Jenkins Activity Survey - Form - B (JAS) (Jenkins et al., 1979; Sood, 1989).

iii) Hindi version of State-Trait Anger Expression Inventory (STAXI) (Spielberger, 1988; Krishna, 1988; Rana, 1990).


7.5 Procedure

The SBP and DBP readings were recorded in the clinic setting with a standard mercury sphygmomanometer after which all the measures were administered individually to the patients under standard instructions in the following order: (i) Life Stress Scales (LSS) (ii) Jenkins Activity Scale (JAS) Form -B (iii) STAXI Scale, and (iv) STAI - A - Trait Scale. A cover sheet elicited the demographic data about age, gender, education, occupation marital status, residence - rural/urban, and family history of hypertension etc.

Following standardized procedures, the percentage/frequency of occurrence of life events, the total as well as positive and negative impact of life changes along with the event-wise analysis to identify a specific clustering of events for each patient group was attempted. Further the scores for each patient were determined in respect of Type A Behaviour
Pattern (TABP), T-Anger, T-Anxiety and Anger Expression (AX/In, AX/Out, AX/Con). S-Anger was excluded from the analysis.

7.6 Statistical Analysis

(i) The frequency/percentage of life events occurrence, (total positive and negative) life changes experienced during the past three years for the two groups, was calculated. The significance of difference among these percentages was tested by two-tailed ‘t’ test.

(ii) For identifying a specific clustering of life events, events-wise (LSS) analysis was carried out to identify the percentage of occurrence of life events specific to the hypertensives and surgical/orthopaedic normotensive controls.

(iii) The scores on the LSS (number/frequency of life events - positive, negative and total; impact of life events-positive, negative and total impact), JAS, STAXI and A-Trait Scale of STAI for the hypertensives and surgical/orthopaedic normotensive controls were subjected to one-way ANOVA (gender or age).

(iv) Step-wise discriminant functional analysis to identify a subset of potential discriminators which distinguished the two patient groups (hypertensives and surgical/orthopaedic normotensive controls).

7.7 Findings

The following were observed:

(i) Regardless of gender and age non-significant trends emerged on the overall percentage of stressful life events between the two patient groups though a relatively greater total percentage of events was reported by the essential hypertension (EH) patients.
(ii) Irrespective of gender or age, the hypertensives report a greater overall impact (regardless of positive and negative impact) of the life events than their normotensive counterparts.

(iii) EH patients reported a significantly greater negative impact of life events stress (changes) than the normotensive (surgical/orthopaedic) patient controls. Similar trend of results emerged for the gender and age sub-categories.

(iv) A reversal in positive life changes was observed within normotensives who experienced nonsignificant but greater positive impact of life events stress. Gender and age subcategorization here too elicited similar trends.

(v) EH patients (regardless of gender or age) were significantly higher on Type A behaviour Pattern, T-Anger and T-Anxiety than their surgical/orthopaedic normotensive counterparts.

(vi) Patients with EH (irrespective of gender or age) when compared to their normotensive (surgical/orthopaedic) controls reported significantly higher overall anger expression (AX/EX) i.e. regardless of the direction of expression.

(vii) The EH patients (regardless of gender or age) reported significantly greater suppression (AX/In) and lesser outward expression of anger than the surgical/orthopaedic normotensive controls.

(viii) The surgical/orthopaedic normotensive controls also reported significantly more anger control (AX/Con) than their matched essential hypertensive counterparts.

(ix) A set of Type A Behaviour Pattern, T-Anger and anger coping (Anger/out, Anger/In) negative impact of life events stress and T-Anxiety was identified that significantly separated all EH patients
from their normotensive controls. Similar findings emerged for male female or gender subgrouping exception being T-Anxiety.

The findings have been presented in terms of profiles and interpreted/integrated along with earlier research. Implications and limitations of the research are highlighted. Some suggestions for future research have also been put forth.