SOME COMMON SYMPTOMS IN RELATION TO BLOOD PRESSURE LEVELS — A POPULATION EXPERIENCE

H.P. LEE
C.S. SEAH
L.P. LOW

SYNOPSIS

Some common symptoms thought to be associated with uncomplicated essential hypertension include headache, giddiness, palpitation, shortness of breath, tiredness, irritability, polyuria and nocturia. The writings to date have yet to settle the validity and significance of these symptoms.

One possible approach would be to study the prevalence of these symptoms in an adult population that is generally unaware of its blood-pressure status. This constituted part of the nationwide blood pressure survey conducted in late 1974. All interviews regarding the occurrence of specific complaints in the month immediately preceding the survey were conducted before the measurement of 3 blood pressure readings.

It was generally noted that women had higher prevalence rates for all symptoms, especially headache, giddiness and palpitation, where the rates are twice as high. Most of the symptoms remain unchanged at all ages, while some increased with succeeding age, namely nocturia (both sexes), palpitation (females only), shortness of breath, tiredness and polyuria (males only). Indians had higher rates of complaint among the females, with significance for headache, shortness of breath and tiredness.

On relating the findings to various categories of systolic and diastolic pressures separately, the only significant symptoms in both instances and in both sexes are as follows:— palpitation, shortness of breath and nocturia. When the mean blood pressures of symptomatics are compared with non-symptomatics, the significant findings include the above 3 symptoms and polyuria. All the other symptoms are, therefore, non-specific.

**Department of Medicine (III),
Singapore General Hospital, Singapore.**
C.S. Seah

**University Department of Social Medicine,
Singapore General Hospital, Singapore.**
H.P. Lee

**University Department of Medicine,
Singapore General Hospital, Singapore.**
L.P. Low

This paper is compiled from the results obtained by the Hypertension Study Group comprising C.S. Seah (Chairman), L.P. Low, H.P. Lee, S.F. Leong, S.H. Wan and W.Y. Chng. It was presented at the 12th Singapore-Malaysia Congress of Medicine, 1977.

INTRODUCTION

It is generally considered in clinical practice that there are some, though vague, symptoms of uncomplicated hypertension. On the

other hand, it is equally clear that the majority of hypertensives, especially those unaware of their condition, are symptomless. Is there much truth about the alleged symptoms of hypertension? The writings to date have yet to settle the controversy. Reports have been apparently conflicting because the study-subjects were quite different, being either patients from a hospital-ward, those referred to specialist hypertension clinics or those seen by general practitioners.

Some of the common symptoms thought to be associated with uncomplicated essential hypertension include the following: headache, giddiness, palpitation, shortness of breath, tiredness, irritability, polyuria and nocturia. It is difficult to determine whether the association is more real than apparent when, as Bulpitt et al (1976) have suggested that it is very often the complaint of a suspected symptom that prompts a medical practitioner to measure a patient's blood-pressure.

One possible approach in the study of this problem would be to determine the prevalence of some of these common symptoms in an adult population that is generally unaware of its blood-pressure status. This constituted part of a nationwide blood pressure survey conducted in Singapore in late 1974. It is the intention of this paper to present the prevalence of selected symptoms in the sample studied and then relate them to blood-pressure distributions and mean levels.

MATERIALS AND METHODS

The survey sample was essentially one of stratified cluster sampling based on all the "reticulated units" that were used for the 1970 Census of Singapore. The sampling procedure has already been described elsewhere (Lee, et al, 1977). There were altogether 4558 respondents aged 20 years and above, and their age, sex and ethnic group distributions corresponded closely to those of the Singapore Census Population of 1970.

Subjects were interviewed before their blood pressures were measured. Among the questions asked were those pertaining to the occurrence of a series of symptoms during the month immediately preceding the date of interview. Symptoms sought for included headache, giddiness, palpitation, shortness of breath, tiredness, irritability, polyuria (more than 5 times a day) and nocturia (more than twice in the night), as commonly understood in everyday conversational terms in English, Malay or one of the major Chinese dialects. None of the interviewers (all non-medical personnel) were briefed to look for any specific symptom.

Measurement of blood pressure was done using the 'Accoson' mercury sphygmomanometers with 12.5 cm × 22.5 cm rubber inflatable cuffs. Three reading were made and the mean calculated taken to represent the casual blood pressure of the subject. Systolc pressure was noted at first audible pulsation and diastolic at disappearance of sound (Korotkoff's phase 5). Some of the relevant findings with regard to blood-pressure status are given in Table 1. 95% of the sample were unaware of their own blood-pressure readings.

The results will be presented according to categories of systolic and diastolic readings taken separately. Mean blood pressure levels are also compared between those with and those without symptoms.

TABLE I: Blood-pressure status of survey population

	Male	Female
Total number	2105	2453
Mean Age (years) ± S.D.	40.5 ± 15.4	39.5 ± 14.9
Age-std. Prevalence Rates (%):		
(a) Borderline hypertension (150-159+/90-94)	12.8	10.3
(b) Definite hypertension (≥ 160+/or ≥ 95)	16.4	11.9

RESULTS

General Prevalence

Almost 70% of males and 80% of females had at least one complaint for the period one month immediately preceding the survey.

The modal rates for most of the individual symptoms were around 15% among males and almost 25% in females. The two symptoms that stood out as relatively uncommon in both sexes were palpitation and shortness of breath (Table II). Women were found to have higher prevalence rates for all symptoms. For some of them, the rates was about twice that of males, namely: headache, giddiness and palpitation. Most of the differences are significant, as indicated by asterisks within the Table.

The age-distributions can be classified under 3 categories:

(a) those that decrease with succeeding age: irritability (both sexes)

(b) those that remain unchanged: headache and giddiness (both sexes) palpitation (males only) shortness of breath, tiredness and polyuria (females only)

(c) those that increase with succeeding age: nocturia (both sexes) shortness of breath, tiredness and polyuria (males only) palpitation

(females only).

The ethnic group differences in the distribution of symptoms among males are minimal (Table III). The main discrepancies occur among the females. Indians seem to have higher rates for most of the symptoms, significantly for headache, shortness of breath and tiredness.

TABLE II: Prevalence rates (%) of specific symptoms in survey population, By sex and Age-group

Symptom	Male				Female			
	20-39 years	40-59 years	60-79 years	X^2-test for age distn	20-39 years	40-59 years	60-79 years	X^2-test for age distn.
a) Headache	17.8	15.8	14.3	N.S.	29.8**	33.0**	25.8**	N.S.
b) Giddiness	13.1	14.1	14.3	N.S.	27.3**	28.0**	29.0**	N.S.
c) Palpitation	6.2	6.1	6.8	N.S.	8.2	11.7**	17.1**	$p<0.01$
d) Shortness of breath	6.6	8.9	14.3	$p<0.01$	11.5**	12.9**	15.5	N.S.
e) Tiredness	15.6	19.5	24.5	$p<0.01$	23.5**	27.1**	27.8	N.S.
f) Irritability	22.0	24.2	13.9	$p<0.01$	30.6**	26.5	22.2*	$p<0.01$
g) Polyuria	29.9	34.4	41.8	$p<0.01$	34.3**	34.7	36.1	N.S.
h) Nocturia	16.1	38.0	62.9	$p<0.01$	32.3**	43.2	54.4	$p<0.01$

Asterisks within table refer to X^2-tests for distribution between males and females according to specific age-groups:
* denotes $p<0.05$
** denotes $p<0.01$
N.S. = Not significant ($p>0.05$)

TABLE III: Prevalence rates (%) of specific symptoms in survey of populations, by sex and ethnic-group

Symptom	Male				Female			
	Chinese	Malay	Indian	X^2-test for distn.	Chinese	Malay	Indian	X^2-test for distn.
a) Headache	16.4	16.2	18.0	N.S.	28.2	33.0	42.3	$p<0.01$
b) Giddiness	13.6	15.3	12.3	N.S.	27.9	30.8	20.4	N.S.
c) Palpitation	6.4	6.0	5.7	N.S.	10.0	11.1	10.6	N.S.
d) Shortness of breath	8.7	8.0	7.1	N.S.	12.5	9.4	19.0	$p<0.05$
e) Tiredness	19.4	12.4	16.1	N.S.	25.4	16.8	38.7	$p<0.01$
f) Irritability	22.6	20.7	17.5	N.S.	28.4	27.1	31.7	N.S.
g) Polyuria	33.6	30.3	32.2	N.S.	34.2	36.2	38.7	N.S.
h) Nocturia	27.8	36.3	33.2	N.S.	38.6	35.3	45.8	N.S.

N.S. = Not significant ($p>0.05$)

Prevalence in relation to blood pressure

Among males, the significant symptoms for hypertensives are as given in Table IV:

Combined systolic and diastolic: nocturia ($p < 0.01$)

Diastolic only: palpitation ($p < 0.05$)

shortness of breath ($p < 0.01$)

For females, the same three symptoms are significant for the hypertensive group (Table V):

Combined systolic and diastolic: palpitation

palpitation (p at least < 0.05)

shortness of breath ($p < 0.05$)

nocturia ($p < 0.01$)

Thus, taking both sexes together, the 3 important symptoms are:

(i) palpitation

(ii) shortness of breath

(iii) nocturia

It is to be noted too that while the general prevalence of the first 2 symptoms is comparatively low, the prevalence of nocturia in general is high. All the above symptoms also increase with succeeding age, irrespective of sex and ethnic group. Age-standardization of the rates has greatly reduced the trend of higher symptom-

TABLE IV: Prevalence rates* (%) of specific symptoms among males, by categories of systolic and diastolic pressures

Symptom	Systolic Pressure				Diastolic Pressure			
	<150 mmHg	150-159 mmHg	≥160 mmHg	X^2-test+	<90 mmHg	90-94 mmHg	≥95 mmHg	X^2-test+
a) Headache	18.0	9.9	8.1	N.S.	17.1	17.6	12.6	N.S.
b) Giddiness	14.6	7.1	8.8	N.S.	13.4	14.2	13.0	N.S.
c) Palpitation	6.4	5.0	5.1	N.S.	6.2	3.4	6.8	$p<0.05$
d) Shortness of breath	8.5	7.1	7.4	N.S.	7.9	6.4	10.3	$p<0.01$
e) Tiredness	19.1	10.6	12.2	N.S.	18.4	15.9	16.5	N.S.
f) Irritability	23.1	12.8	11.0	N.S.	22.6	21.0	14.8	N.S.
g) Polyuria	34.2	25.5	21.3	N.S.	34.0	29.5	26.6	N.S.
h) Nocturia	27.7	28.4	35.0	$p<0.01$	28.5	27.4	30.8	$p<0.01$

*Rates age-standardised according to 5-year age-groups of survey population.
N.S. = Not significant ($p > 0.05$)
+X^2-test for distribution between symptomatics and non-symptomatics.

TABLE V: Prevalence rates* (%) of specific symptoms among females, by categories of systolic and diastolic pressures

Symptom	Systolic Pressure				Diastolic Pressure			
	<150 mmHg	150-159 mmHg	≥160 mmHg	X^2-test+	<90 mmHg	90-94 mmHg	≥95 mmHg	X^2-test+
a) Headache	34.8	19.8	15.7	N.S.	34.6	20.4	17.7	N.S.
b) Giddiness	31.7	17.5	16.5	N.S.	31.2	22.3	17.1	N.S.
c) Palpitation	10.8	9.3	10.1	$p<0.01$	10.9	7.6	10.4	$p<0.05$
d) Shortness of breath	13.8	5.2	10.1	$p<0.05$	13.5	7.1	12.3	$p<0.05$
e) Tiredness	28.6	12.2	16.9	N.S.	27.4	20.9	19.5	N.S.
f) Irritability	33.2	17.5	13.3	N.S.	32.1	19.0	18.3	N.S.
g) Polyuria	39.1	26.2	21.2	N.S.	38.8	23.7	25.0	N.S.
h) Nocturia	41.2	30.2	32.8	$p<0.01$	40.3	35.1	36.6	$p<0.01$

*Rates age-standardised according to 5-year age-groups of survey population.
N.S. = Not significant ($p > 0.05$)
+X^2-test for distribution between symptomatics and non-symptomatics.

prevalence at higher blood pressures.

From Table VI, it can be seen that the four symptoms with significantly higher mean systolic and diastolic pressures in the symptomatic group are:

(i) palpitation ($p < 0.01$)
(ii) shortness of breath ($p < 0.01$)
(iii) nocturia ($p < 0.01$)
(iv) polyuria ($p < 0.01$)

The first three symptoms are repeated, with the addition of polyuria.

TABLE VI: Mean systolic and diastolic pressures among persons with specific symptom and those without symptom

Symptom	Mean Systolic		Mean Diastolic	
	With Symptom	Without Symptom	With Symptom	Without Symptom
a) Headache	125.7	127.1**	79.1	79.9**
b) Giddiness	125.9	127.0**	79.2	79.8**
c) Palpitation	129.8**	126.5	81.4**	79.5
d) Shortness of breath	128.6**	126.6	81.1**	79.5
e) Tiredness	127.2 N.S	126.7	80.0 N.S	79.6
f) Irritability	125.6	127.2**	78.9	80.0**
g) Polyuria	127.9**	126.3	80.2**	79.4
h) Nocturia	131.5**	124.4	81.4**	78.8

The higher of each pair of mean values is underlined.
Asterisks within the table refer to t-tests:
*denotes $p < 0.05$
** denotes $p < 0.01$
N.S. denotes not significant ($p > 0.05$)

DISCUSSION

It is now generally accepted that the symptoms of uncomplicated essential hypertension are rare. Some of the early workers have been too quick to look for symptoms, and in so doing justified their personal bias. Janeway's "typical morning headache" (1913) is by now notorious. It is also equally interesting to note such descriptions for hypertensive headaches as "frontal or occipital" (Platt, 1950) or "paroxysmal, throbbing or bursting" (Brain, 1952).

Most of the early studies were uncontrolled descriptions of the clinical profiles of selected patients who were aware of their hypertensive state. Janeway's study, for example, based on his own private patients, contained nearly every symptom suspected.

As early as 1930, Riseman and Weiss have indicated that symptoms in psychoneurosis are very similar, and that no one symptom is typical of arterial hypertension. Ayman and Pratt (1931) further refuted the concept of increased blood pressure as the cause for the symptoms on the grounds that there was no correlation between onset, number and severity of symptoms and the level of blood pressure. Many patients in their study, had no symptoms or else had their symptoms relieved without a change in the pressure. In fact, they remarked high blood pressure is in itself a symptom.

Some more recent studies have not thrown much light on this controversial subject. Stewart (1953) in his study of patients with diastolic more than 120 mm mercury, could only state that headache can result from high blood pressure, but they are rare. Very often, the anxiety associated with the knowledge of one's own pressure status is a more potent cause of the headache. Bulpitt et al (1976) surmised that headaches are common among neurotic patients but even more so in hypertensives with psychoneuroses.

Bechgard (1967) noted in a very persistent cohort study of 1000 subjects over a period of 26 to 32 years, that symptoms such as headache, nervousness or vertigo usually prompted the measuring of blood pressure and even the treatment especially if not otherwise indicated. Nevertheless, he did find a few important symptoms, namely: dyspnoea on exertion and palpitation.

Bulpitt et al (1976), while recognising that hypertension is generally symptomless, have nevertheless separated the symptoms into two groups, the "untreated" and the "treated". Based on self-administered questionnaires, among the untreated hypertensives, the significant symptoms are waking headache, blurred vision and depression, although the authors readily admit that blood pressure is often not measured and hypertension not diagnosed without a suspected associating symptom like headache.

Weiss (1972) concluded from the 1960 US National Health Examination Survey that symptoms tend to be more among patients who:

(a) have visited a hypertensive clinic within the preceding 12 months;
(b) have had their blood-pressure measured;
(c) are aware of their high blood-pressure status.

The present study conducted among adults who are unaware of their blood pressure measurements, has shown a scarcity of definite symptoms of hypertension. The prevalence of symptoms in the general community is high, more among females and tending to increase with succeeding ages.

Subjects have different thresholds of awareness as well as varying reactions to different symptoms. The one that is more common would be more readily recognised and reported, but would probably be suggestive of a variety of conditions. Most of the

symptoms have prevalence rates of about 15-30%. The less prevalent ones are palpitation and shortness of breath, while nocturia is much higher.

When compared against blood-pressure status, the 4 significant symptoms are:

(i) palpitation
(ii) shortness of breath
(iii) nocturia, and polyuria

It is interesting that the first two have comparatively low general prevalence rates while nocturia and polyuria are much higher. Many of them have increasing rates at subsequently higher age-groups, and as shown by the age-standardization of the rates according to different categories of blood pressures, age is an important factor of influence. The prevalence of symptoms like the four mentioned tends to be higher in older age-groups, who would also have higher blood pressures.

Palpitation and shortness of breath are both unusual symptoms. The apparently healthy person is not usually conscious of either his heart beat or his respiration, except at times of physical exertion. The presence of such alarming symptoms would provoke severe emotional distress and would thus be more faithfully reported. Such symptoms should therefore be taken seriously. Whether they refer to cardiovascular or pulmonary involvement or an anxiety state remains to be verified.

Nocturia, taken as having to void more than twice a night, and polyuria (more than five times in the day) seem to be common occurrences in more than 30% of the general population. Hypertensives have even higher rates. Again, the mechanisms have yet to be clarified be it renal insufficiency or osmotic diuresis due to increased salt load. These are symptoms that will not disappear with treatment, especially with diuretics (Bulpitt, 1976).

The point to be emphasised is that in a population which is generally unaware of its blood-pressure status, specific symptoms of uncomplicated hypertension are rare. The need is for regular measurements for all adults irrespective of subjective complaints.

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