

Variation in blood pressure with age and sex of the Uva-Bintenne Veddas

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Abstract

The blood pressure of 496 (227 males and 269 females) Uva-Bintenne Veddas in the age range 1 to 80 years were recorded at Hennanigala South and Dambana.

In both males and females there is no progressive increase of pressure with age. In the females both curves are more variable with the systolic pressure higher than in the males except in the age range 31-40 and the diastolic pressure higher up to 50 years.

When compared with a 1989 study of a rural breeding isolate of the Sinhalese the pressures of both males and females were significantly higher in the age range 1-15 years with no steep rise of the curve from 1-18 years. The aetiology of the difference is postulated to be genetic rather than environmental.

Key Words: blood pressure, variation with age and sex, "primitive" population

Introduction

The earliest publication on the variation in blood pressure with age and sex of Sri Lankans was in 1949(1). In that study the brachial systolic (SP) and diastolic (DP) pressures of 7000 individuals between the ages 10 – 50 years were recorded during an island wide physical fitness survey. The next study 40 years later was on the variation with age and sex of the blood pressures of the

inhabitants of Talkote – a purana village at the foot of Sigiriya. The brachial SP and DP of 254 (132 of males and 122 of females) in the age range 1 to 80 years of a total of 354 were recorded as a part of a comprehensive biometric study of the village in 1989(2). The present study deals with variation in blood pressure with age and sex of two groups of Uva-Bintenna Veddas. Colonisation of the Uva-Bintenna Veddas was attempted in 1958. Houses were built for them at Kandagamvila. However the Veddas of Dambana led by Uruwarige Tisahamy resisted colonization. The Kandegamvila Veddas were relocated at Hennanigala South of Mahaweli System C and allocated hunting grounds in a forested hill slope several miles away in 1980. The Veddas of Dambana once again resisted relocation even though their traditional hunting grounds were declared a National park reserve in 1982. In the present study the brachial SP and DP of the Kandegamvila Veddas relocated in Hennanigala South of the Mahaweli System C recorded during field visits in 1993 and 1994 are described. The brachial SP and DP of the Dambana Veddas were recorded during field visits in 1995 and 1996.

Populations and method

The Veddas of Kandegamvila were traced at Hennanigala South by their original household numbers. At Dambana the Vedda

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households at Kotabakina, Watuyaya and Girikumbara were identified. Both at Hennanigala and Dambana only individuals from Vedda matings for at least three generations were included in the study. Offspring of mixed Vedda/ Sinhalese matings were excluded. During the comprehensive biometric study at both locations Hennanigala South and Dambana the Veddas were identified by their clan name (Warige) and the given name, sex and age were recorded. During the interview, medical history taking and physical examination of the chest the subject was seated at ease for at least 5 minutes. The brachial SP and DP were then measured using an *Accoson* sphygmomanometer with the arm of the subject resting on a table at the level of the chest. The pressures of the younger children were measured with the children on the mothers' laps. The arm of the child rested on the arm of the mother placed on the table as before. An infant cuff was used for children below 10 years. The reading at which muffling of the sound occurred was taken as DP. Each subject had this casual BP recorded only once.

Results

SP and DP of 119 males and 167 females were available from the Hennanigala and 118 males and 94 females from the Dambana group. The results were tabulated separately for males and females according to 5 year age intervals up to 40 years and 10 year intervals up to 80 years and the means calculated. As there was no statistically significant difference between the two groups at each age interval both for males and females the results were pooled giving a total of 496 (227 males and 269 females). The pooled means of SP and DP measured in

mmHg and the standard error of the means are given in Table 1.

The results are presented graphically in Figure 1. Results of age groups with less than 6 subjects are not included in the Figure. In the males commencing with values of 107 and 71 mmHg both SP and DP increase imperceptibly to reach the values of 131 and 88 mmHg at 70 years. The SP is more variable than the DP. In the females too commencing with values of 104 and 70 mmHg both SP and DP increase to reach 125 and 83 mmHg at 70 years with the SP more variable than the DP as in the males. Commencing with values slightly lower than those in the males SP are higher in the females except in the age interval 31 to 40 years. The DP commencing slightly lower than those in the males remains higher till 50 years. There is no increase in pressure with age; with differences in SP of 24.8 and DP of 16.2 mmHg in the males and 21.2 and 30 mmHg in the females respectively over the age range 1 to 70 years.

Discussion

Lowenstein 1961 (3) reviewing 26 studies on the variation with age and sex of blood pressures from the tropics and subtropics and his own research in two tribes of Brazil Indians one more primitive than the other, postulated that the "rise of blood pressure with age is a consequence of civilization" and called for "more group studies of blood pressure levels in people living at different stages of civilization". In most of these studies the pressures of females were higher than that of the males but in a few the pressures of the males was higher than that of the females. The islandwide cross sectional study of Bibile, Cullumbine, Kirthisinghe, Watson and Wikramanayake 1949 (1) of

Table 1. Mean systolic and diastolic blood pressures of the study population

Age (years)	Male					Female				
	n	Systolic		Diastolic		n	Systolic		Diastolic	
		Mean	SE	Mean	SE		Mean	SE	Mean	SE
1-5	19	106.6	2.59	71.3	1.83	25	103.8	1.92	70.0	1.50
6-10	42	108.7	1.61	71.9	1.13	48	109.4	1.96	74.1	1.34
11-15	32	114.7	2.24	73.1	1.20	44	114.0	1.50	73.1	1.15
16-20	22	112.7	1.64	75.7	1.37	18	117.4	1.30	77.2	1.09
21-25	19	116.0	1.73	76.3	1.57	24	120.6	1.81	77.1	1.38
26-30	28	112.9	1.81	76.3	1.30	26	116.9	1.76	77.98	0.93
31-35	15	120.3	2.60	79.3	1.88	19	119.0	1.05	76.8	1.39
36-40	11	117.3	1.95	77.7	1.56	13	117.7	1.66	79.6	1.83
41-50	15	120.0	3.24	79.5	1.53	21	124.5	3.08	80.9	1.72
51-60	11	124.6	3.66	82.7	1.95	18	122.5	3.29	83.0	1.77
61-70	7	131.4	3.40	87.9	4.86	4	125.0	6.45	83.0	4.79
71-80	3	123.3	8.82	75.0	5.00	1	135.0		105.0	
>80	3	123.3	8.82	80.0	5.77	0				

Blood pressures were measured in mmHg

SE = Standard error of mean

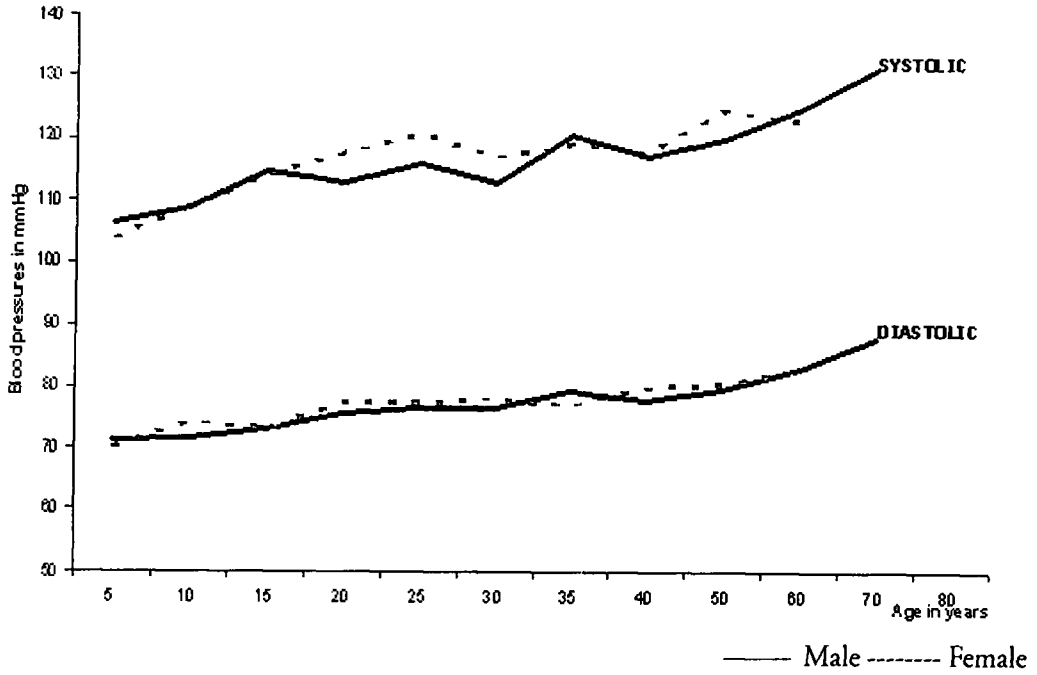


Figure 1. Mean systolic and diastolic blood pressures of the study population

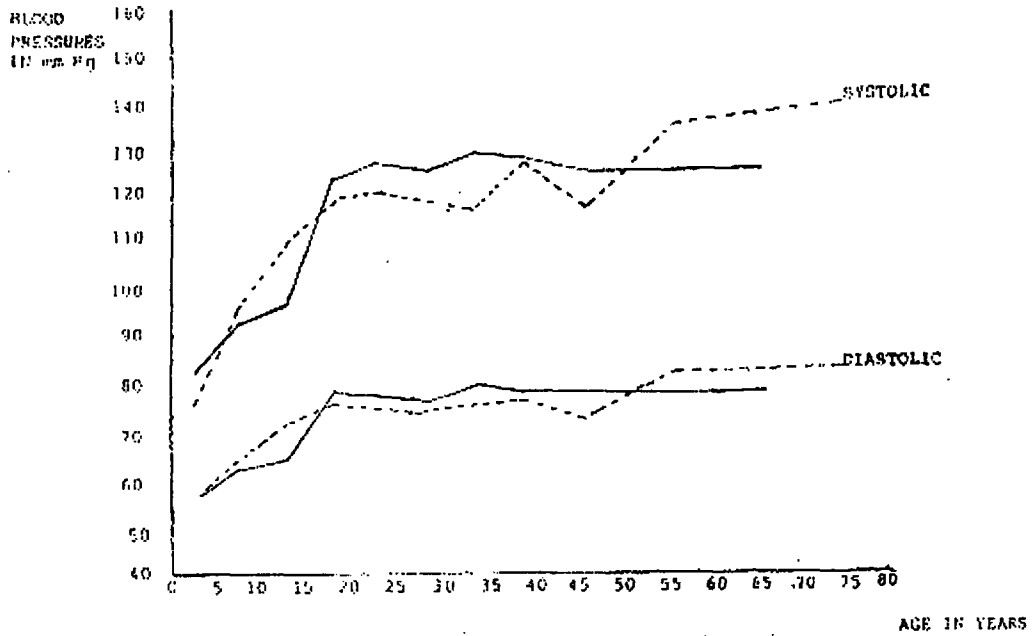


Figure 2. Mean systolic and diastolic blood pressures of the 1989 study

Source

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7,000 Ceylonese of mixed ethnicity and from both rural and urban environments selected on a physical fitness survey was included in the review. Lowenstein observed an increase in pressure with age only in the females with marginally higher pressures also in the females. Shaper 1972 (4) reviewing studies on blood pressure and hypertension from the tropics identified changes in environment from rural to urban, socio-cultural factors, increased intake of salt in the diet and obesity as epidemiological factors in the increase of blood pressures with age.

Wikramanayake, Chandrasekera and Sunil 1989 (2) studied 254, (132 males and 122 females) of a total of 353 inhabitants of the rural Sinhalese purana village of Talkote at the foot of Sigiriya. The villagers practice caste effective endogamy with 70% sharing one of the 3 "ge" names and 30% first cousin matings. When compared with the 1949 study (1) both SP and DP were higher in both males and females with the differences being statistically significant at all ages in the males but only in the younger age groups in the females. There was no increase of SP and DP with age in either sex and blood pressures were lower in the females up to 50 years. The authors postulated that the aetiology for the higher pressure may be genetic rather than environmental (2). The present study is on the variation in blood pressure with age and sex of 496 (227 males and 269 females) Uva-Bintenne Veddas from two locations Hennanigala South and Dambana. In both locations the Veddas too practise clan effective endogamy with a high proportion of first cousin matings. The results of the present study are directly comparable with that of the Sinhalese of the purana village as it too was done by the same

authors using the same methodology. For ease of comparison the results of the 1989 study are represented graphically in Figure 2 with the age intervals of 5 years through the age range 1-80 years.

On comparison the SP and DP in both males and the females in present study are higher in the age range 1-15 years. In the males the values are statistically significant ($p < 0.05$) both for SP and DP for the age intervals 1-5 years and 5-10 years. In the females for the same age intervals only DP is not significantly higher at 1-5 years. There is no steep rise of pressure from 1-18 years. The pressures are higher in the females except for SP in the age range 31-40 years. The Sinhalese of Talkote are a breeding isolate of agriculturists tracing their ancestry to the 5th century A.D (2). The Veddas are the biological link between the prehistoric, protohistoric and historic populations of Sri Lanka (5). They are still in transition from a hunter-gatherer lifestyle to that of settled agriculture. The body mass indices (BMI) of the Sinhalese of Talkote and the Veddas of Uva-Bintenne are comparable with no obesity in either population (6,7). Kshatriya 1995 (8) reported that the Veddas are genetically distinct from the Sinhalese. It is postulated that the aetiology of the significantly higher pressures and difference in the pressure curves of the Uva-Bintenne Veddas in the age range 1-15 years when compared with the Sinhalese of Talkote is genetic rather than environmental.

Acknowledgements

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