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Variation in Systolic and Diastolic Pressure with Changes in Age and Weight*

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Blood pressure determination provides a rapid and readily obtained index of the functioning of the circulatory system. As actuarial records show that a higher rate of mortality is associated with higher blood pressure, primarily because of the increased incidence of cardiovascular-renal diseases among persons with higher blood pressure, the index has diagnostic and prognostic importance (*Pickering*, 1961). Interpretation of specific values depends upon knowledge of the distribution of blood pressure in the general population, as well as in patients suffering from pathological conditions.

By demonstrating that there is not a unique class of blood pressure values that may be regarded as hypertensive, and that blood pressure is continuously distributed in the general population, the work of *Hamilton, Pickering, Fraser Roberts and Sowry* (1954) has led to investigations of the factors affecting blood pressure in the general population. *Pickering* (1955, p. 151) has pointed out that "Age and inheritance are the only factors determining arterial pressure in the population at large, whose magnitude are as yet assessed, even though this assessment is as yet a most imperfect one". Comparison of the blood pressures of persons classified by age has shown that the mean rate rises with age. The rate of rise differs for systolic and diastolic pressure, and also according to sex. Although it is known that body weight can affect blood pressure, the magnitude of its effect in the general population has not been systematically assessed. For a sample of men in India, *Das* (1959, 1960, 1961) found that systolic and diastolic pressure were significantly correlated with both age and weight.

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Blood pressure surveys conducted in different geographic areas may be expected to provide information concerning the aetiology of high blood pressure. While mean values might differ among different areas, due to such factors as climate and diet, observed relationships between blood pressure and other physiological factors may be expected to be relatively consistent. The mean rise of blood pressure with age provides an example of a relationship which has been shown in widely varying geographic areas (Pickering, 1961).

The survey reported in this paper was undertaken to examine whether the relationships between age, weight and blood pressure previously reported for males (Das, 1959) would be confirmed in a larger sample including both sexes. A methodological comparison of the fourth phase and fifth phase criteria for diastolic pressure served as a secondary objective in the survey.

Methods

A random sample of households in the village of Dum Dum, within the greater Calcutta region, was selected according to the procedure outlined by the *National Sample Survey* (1960). Adjacent selected households were visited on successive days, and all members of each household over 14 years of age were requested to go to a nearby school on the following morning for survey measurements. The survey was conducted during January and February 1960; mean maximum and minimum temperatures during January were 20.6°C and 10.1°C and during February were 30.3°C and 10.5°C; mean relative humidities were 66% and 62%.

Data were collected for a total of 382 males and 625 females, ranging in age from 15 to above 70. All persons included in the survey were Bengalis (residents of the state of West Bengal, speaking the Bengali language), nonvegetarians whose main source of carbohydrate was rice, belonging to the lower economic stratum of office workers. The males were employed mainly in minor clerical activities and the females in household activities in their own residences.

The following data were recorded for each subject: age, height, weight, pulse, systolic and diastolic pressure. The procedure adopted for measurement was as follows: the subjects came to the school room, between the hours of 8 and 10 a.m., and rested for half an hour. Age and customary diet were recorded, pulse and blood pressure determinations made, and height and weight measured. Right and left systolic and diastolic pressures in mmHg were determined by the auscultatory method with a baumanometer (W. A. Baum Co., Long Island, New York). The reading obtained when the first sound is heard was recorded as the systolic pressure, the point of abrupt diminution in sound was recorded as the fourth phase diastolic pressure, and the point of complete cessation of sound was recorded as the fifth phase diastolic pressure (*American Heart Association*, 1951). Blood pressure determinations were made first on the right arm for every other subject, and first on the left arm for the remaining subjects. Height was measured with an anthropometer (*G. P. M.*, Switzerland) and weight was measured on a Salter Scale (Grosvenor, England) which had been standardized. The same person made all the blood pressure determinations, using the same baumanometer, and all pulse measurements; another person made height and weight measurements of all the subjects using the same instruments throughout the survey.

Table I
 Mean Pulse Rate and Blood Pressure of Male and Female Adult Bengalis According to Age

Age in years (1)	N* (2) (3)		Pulse rate (4) (5)		Systolic pressure (6) (7)		Left. diastolic pressure (8) (9)		4th phase (10) (11)		Left diastolic pressure (12) (13)		4th phase (14) (15)		Left diastolic pressure (16) (17)	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
15-19	41	66	77.51	91.06	116.88	116.76	115.61	114.88	72.49	72.09	67.27	64.76	74.20	73.06	68.00	65.73
20-24	52	65	77.27	87.97	120.27	119.23	118.35	116.82	75.38	74.80	69.62	69.54	76.31	73.78	71.42	69.60
25-29	32	71	79.72	86.72	118.88	119.49	117.00	115.46	76.56	75.92	71.88	69.56	77.00	75.62	72.44	70.94
30-34	32	86	77.97	85.82	116.94	116.05	114.94	113.63	76.69	76.77	72.48	71.20	77.95	76.93	74.34	74.50
35-39	41	66	76.85	83.88	119.56	121.85	119.40	119.58	78.40	80.45	73.60	76.42	79.07	80.13	74.49	76.55
40-44	25	52	76.38	86.19	122.23	127.05	120.23	124.69	80.69	83.70	76.38	78.79	80.77	84.19	76.46	79.17
45-49	23	55	81.35	84.42	120.00	129.05	117.13	127.82	82.35	84.52	78.61	79.38	82.61	84.58	80.69	79.31
50-54	23	54	79.10	87.65	134.14	133.74	132.00	131.22	85.38	81.52	80.83	76.37	85.17	82.52	80.69	76.70
55-59	21	25	76.05	84.84	140.76	136.96	137.81	137.04	84.00	82.40	78.38	76.48	84.00	82.00	78.38	77.52
60-64	21	13	80.10	87.54	140.29	139.08	136.48	138.15	79.81	84.62	73.52	80.00	80.76	84.92	72.29	79.54
65-69	19	13	82.00	91.16	144.11	144.74	139.16	143.37	79.68	80.11	73.58	71.79	79.05	79.68	73.47	73.26
70 and above																

* In this and subsequent tables, N is the number of individuals measured, M refers to males and F refers to females.

Table II
 Mean Pulse Rate and Blood Pressure of Male and Female Adult Bengalis According to Weight

Weight in pounds (1)	N M F (2) (3)	Pulse rate (4)		M rate (5)		Synolic pressure (7)		Left M F (8)		Right diastolic pressure 4th phase P (10)		5th phase P (11)		Left diastolic pressure 4th phase P (14)		5th phase P (15)		Right diastolic pressure 4th phase P (16)		5th phase P (17)		
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
60-69	1	35	106.00	86.71	110.00	130.11	114.00	127.31	70.00	79.71	50.00	73.20	70.00	80.46	58.00	80.46	58.00	80.46	58.00	80.46	58.00	74.51
70-79	11	135	76.09	86.64	116.18	121.13	113.45	118.68	70.73	76.65	64.91	70.74	70.73	76.99	64.73	76.99	64.73	76.99	64.73	76.99	64.73	70.93
80-89	26	170	79.46	87.05	124.38	121.86	121.92	119.22	75.38	77.86	68.77	72.46	75.77	77.87	69.77	77.87	69.77	77.87	69.77	77.87	69.77	72.92
90-99	91	147	78.78	87.44	119.93	123.20	118.33	121.43	76.44	78.68	71.63	73.56	77.30	79.07	72.13	79.07	72.13	79.07	72.13	79.07	72.13	73.99
100-109	94	82	76.63	84.85	120.23	123.71	117.13	121.32	76.79	78.88	71.57	73.98	77.36	79.22	71.94	79.22	71.94	79.22	71.94	79.22	71.94	73.78
110-119	58	23	77.48	86.22	123.10	125.99	119.76	124.09	78.52	82.70	74.14	78.78	79.52	81.83	74.48	81.83	74.48	81.83	74.48	81.83	74.48	79.13
120-129	40	21	78.55	86.52	127.60	127.52	126.03	124.67	80.95	83.90	76.80	80.10	81.25	84.95	76.70	84.95	76.70	84.95	76.70	84.95	76.70	80.38
130-139	32	4	79.00	80.00	135.06	137.50	134.23	135.50	86.94	96.00	82.13	94.00	87.44	97.00	83.13	97.00	83.13	97.00	83.13	97.00	83.13	94.00
140-149	16	4	79.50	84.00	129.63	150.00	126.25	149.50	86.13	90.50	81.25	85.50	86.00	91.50	82.00	91.50	82.00	91.50	82.00	91.50	82.00	87.50
150-159	13	2	84.69	77.00	128.92	116.00	126.92	117.00	86.31	75.00	82.62	66.00	86.62	74.00	82.92	67.00	82.92	67.00	82.92	67.00	82.92	67.00

Table III

Analysis of Variance Summary Tables Comparing Pulse Rate and Blood Pressure of Adult Bengalis Grouped According to Age

Variable	Source of variation	Degrees of freedom	Males		Degrees of freedom	Females	
			Mean square	F		Mean square	F
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pulse rate	Between	11	90.3300	0.87	11	276.6635	2.39**
	Within	370	103.9120		613	115.6328	
Right systolic pressure	Between	11	2895.7719	10.40**	11	3395.1768	12.43**
	Within	370	278.4395		613	273.1015	
Left systolic pressure	Between	11	2743.6868	9.57**	11	3662.7938	12.29**
	Within	370	286.7157		613	298.1439	
Right diastolic pressure: 4th phase	Between	11	427.0748	3.60**	11	864.2478	8.78**
	Within	370	118.6736		613	98.4250	
Right diastolic pressure: 5th phase	Between	11	493.6825	3.34**	11	1147.1458	8.31**
	Within	370	147.8520		613	138.0520	
Left diastolic pressure: 4th phase	Between	11	322.0235	2.76**	11	848.0265	7.79**
	Within	370	116.6519		613	108.8898	
Left diastolic pressure: 5th phase	Between	11	377.6306	2.70*	11	1034.0251	7.78**
	Within	370	139.7333		613	132.8793	

* $P < .05$.

** $P < .01$.

Results

The mean pulse rate and blood pressure values for the entire set of subjects classified into age groups are given in table I. Similar mean values for the same subjects reclassified into weight groups are given in table II. The analyses of variance testing the significance of the differences between the means of the age groups are given in table III, which shows that mean pulse rate differed significantly for females but not for males, and that all blood pressure determinations differed significantly. The analyses of variance given in table IV for subjects classified by weight show that mean pulse rate did not differ significantly for males or females, but that all blood pressure determinations differed significantly.

To compare diastolic values for the two arms and for both phases, correlations were computed which are given in table V. The correlations between phases and between arms are uniformly high

Table IV

Analysis of Variance Summary Tables Comparing Pulse Rate and Blood Pressure of Adult Bengalis Grouped According to Weight

Variable (1)	Source of variation (2)	Degrees of freedom (3)	Males Mean square (4)	F (5)	Degrees of freedom (6)	Females Mean square (7)	F (8)
Pulse rate	Between	9	194.5490	1.92	11	103.2954	0.88
	Within	372	101.3175		613	117.7850	
Right systolic pressure	Between	9	988.0380	2.92**	11	1661.5600	5.48**
	Within	372	338.6661		613	303.0470	
Left systolic pressure	Between	9	705.3652	2.07**	11	1561.9235	4.78**
	Within	372	341.2288		613	326.7765	
Right diastolic pressure: 4th phase	Between	9	653.307	5.69**	11	391.5100	3.66**
	Within	372	114.858		613	106.9086	
Right diastolic pressure: 5th phase	Between	9	830.1366	5.87**	11	527.1609	3.54**
	Within	372	141.3028		613	148.8512	
Left diastolic pressure: 4th phase	Between	9	625.0047	5.66**	11	429.2224	3.69**
	Within	372	110.4259		613	116.4051	
Left diastolic pressure: 5th phase	Between	9	821.9009	6.34**	11	545.3369	4.31**
	Within	372	129.7262		613	126.6404	

** $P < .01$.

and significant; this observation serves as an index of the reliability of the measurement procedure. For the entire sample of males, mean diastolic values were as follows: right fourth phase 78.68, right fifth phase 73.75, left fourth phase 79.28, and left fifth phase 74.21. The values for the entire sample of female subjects, in the

Table V

Correlations and *t* Tests Comparing Phase and Arm Measured for Diastolic Pressure of Adult Bengalis

Pair of measures (1)	Males (<i>N</i> = 382)		Females (<i>N</i> = 625)	
	Correlation (2)	<i>t</i> (3)	Correlation (4)	<i>t</i> (5)
4th and 5th phase right arm	.957**	26.0243**	.932**	29.1839**
4th and 5th phase left arm	.957**	27.9675**	.884**	23.0035**
Right and left arms 4th phase	.976**	4.7900**	.922**	1.6606
Right and left arms 5th phase	.961**	2.5894**	.974**	3.1465**

** $P < .01$.

same order, were 78.64, 73.25, 79.93 and 73.68. The fourth and fifth phase values for the same arm differed significantly, as shown by the "t" test for correlated means, for right and left arms of male and female subjects. Comparing the values obtained for the two arms, fourth phase diastolic pressure differed significantly in males, and fifth phase diastolic pressure differed significantly in males and females.

Correlations between age, height, weight, right systolic pressure and right diastolic pressure (fifth phase) are given in table VI for the male and female samples. Significantly positive correlations oc-

Table VI

Correlations between Age, Height, Weight, Systolic and Diastolic Pressure for Male and Female Adult Bengalis

Variable (1)	Sex (2)	Height (3)	Variable Weight (4)	Systolic pressure (5)	Diastolic pressure (6)
Age	M†	-.1887**	-.0519	.3952**	.2154**
	F††	-.1945**	-.0590	.3850**	.2867**
Height	M		.4173**	-.0772	-.0495
	F		.3724**	-.1190**	-.0149
Weight	M			.2143**	.3355**
	F			.1052**	.1812**
Systolic pressure	M				.6534**
	F				.5793**

† N = 382.

†† N = 625.

** P < .01.

cur between the following pairs of measurements: age and systolic pressure, age and diastolic pressure, height and weight, weight and systolic pressure, weight and diastolic pressure, and systolic and diastolic pressure. For the prediction of blood pressure from information about age and weight, the following multiple regression equations were obtained (*Walker and Lev, 1953*):

(i) Systolic pressure in males, $S'_M = 79.9052 + .4518A + .2338W$

(ii) Systolic pressure in females, $S'_F = 92.7593 + .4517A + .1513W$

(iii) Diastolic pressure in males, $D'_M = 41.7944 + .1726A + .2302W$

(iv) Diastolic pressure in females, $D'_F = 49.8379 + .2364A + .1614W$

where S'_M and S'_F refer to expected systolic pressure in mmHg for males and females respectively,

D'_M and D'_F refer to expected diastolic pressure (fifth phase) in mmHg for males and females respectively,

A refers to age in years, and

W refers to weight in pounds.

The multiple correlations associated with these four equations were (i) .4598, (ii) .4058, (iii) .4086 and (iv) .3487; all are significant ($P < .01$). Using these equations, fitted or predicted systolic pressures have been computed and are given in table VII for males

Table VII

Observed and Fitted Values of Systolic Pressure in mmHg of Male and Female Adult Bengalis According to Age and Weight

Age in Years (1)	Value* (2)	Weight in pounds									
		70-89		90-109		110-129		130-149		150-169	
	M	F	M	F	M	F	M	F	M	F	
15-24	O 108.6	119.0	115.8	116.7	123.9	143.5	137.0	-	-	-	
	F (107.6)	(113.9)	(112.3)	(116.9)	(117.0)	(119.9)	(121.7)	(123.0)	(126.4)	(126.0)	
25-34	O 105.0	117.2	112.4	115.5	119.3	120.7	123.3	145.0	136.0	-	
	F (112.2)	(118.4)	(116.8)	(121.4)	(121.5)	(124.5)	(126.2)	(127.5)	(130.9)	(130.5)	
35-44	O 107.3	118.8	117.3	119.6	117.8	128.8	120.3	137.3	125.3	-	
	F (116.7)	(122.9)	(121.4)	(126.0)	(126.0)	(129.0)	(130.7)	(132.0)	(135.4)	(135.0)	
45-54	O 116.3	123.1	120.7	130.2	122.1	133.3	122.3	136.0	-	-	
	F (121.2)	(127.4)	(125.9)	(130.5)	(130.6)	(133.5)	(135.2)	(136.5)	(139.9)	(139.6)	
55-64	O 126.8	131.1	127.6	136.5	143.0	146.0	158.4	-	-	-	
	F (125.7)	(132.0)	(130.4)	(135.0)	(135.1)	(138.0)	(139.8)	(141.0)	(144.4)	(144.1)	
65-74	O 148.3	142.8	144.7	139.4	134.4	-	167.0	-	-	-	
	F (130.2)	(136.5)	(134.9)	(139.5)	(139.6)	(142.5)	(144.3)	(145.6)	(148.9)	(148.6)	

* O = Observed value; F = Fitted value.

and females. In addition, the observed systolic pressures for the subjects classified by both age and weight are also given in table VII. The values of systolic pressure fitted by the equations according to age and weight are represented as a bivariate surface in figure 1 for males. The three dimensions are pressure in mmHg as height, age in years as length, and weight in pounds as width. The blood pressure surface in figure 1 shows the influence of both age and weight. Fitted and observed diastolic pressures are given in table VIII for

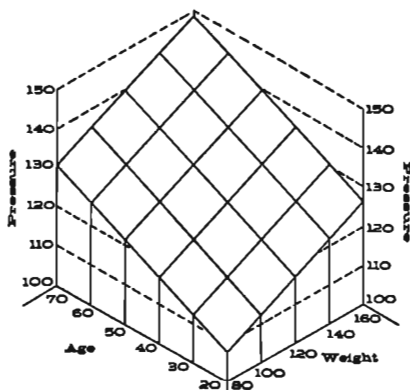


Fig. 1. Fitted values of right systolic pressure as a function of age and weight in male Bengalis. Pressure in mmHg is given as height, age in years as length, and weight in pounds as width of the figure. The slope of the top surface from front to back illustrates the effect of age, and from left to right the effect of weight.

Table VIII

Observed and Fitted Values of Diastolic Pressure in mmHg of Male and Female Adult Bengalis According to Age and Weight

Age in years (1)	Value* (2)	Weight in pounds									
		70-89		90-109		110-129		130-149		150-169	
		M (3)	F (4)	M (5)	F (6)	M (7)	F (8)	M (9)	F (10)	M (11)	F (12)
15-24	O	67.7	66.8	67.6	66.8	71.7	77.2	67.5	-	-	-
	F	(63.7)	(67.5)	(68.2)	(70.7)	(72.9)	(73.9)	(77.5)	(77.2)	(82.1)	(80.4)
25-34	O	65.0	69.6	68.7	69.9	75.2	76.8	79.8	102.0	84.5	-
	F	(65.4)	(69.8)	(70.0)	(73.1)	(74.6)	(76.3)	(79.2)	(79.5)	(83.8)	(82.8)
35-44	O	66.0	73.2	73.5	76.2	73.6	79.8	78.0	84.0	84.0	-
	F	(67.1)	(72.2)	(71.7)	(75.4)	(76.3)	(78.7)	(80.9)	(81.9)	(85.5)	(85.1)
45-54	O	73.7	78.6	79.5	78.1	77.9	83.3	78.9	88.0	-	-
	F	(68.8)	(74.6)	(73.4)	(77.8)	(78.1)	(81.0)	(82.7)	(84.3)	(87.3)	(87.5)
55-64	O	71.0	74.9	73.3	78.7	85.2	84.0	94.8	-	-	-
	F	(70.6)	(76.9)	(75.2)	(80.2)	(79.8)	(83.4)	(84.4)	(86.6)	(89.0)	(89.8)
65-74	O	65.4	70.9	74.4	79.2	74.6	-	93.0	-	-	-
	F	(72.3)	(79.3)	(76.9)	(82.5)	(81.5)	(85.8)	(86.1)	(89.0)	(90.7)	(92.2)

* O = Observed value; F = Fitted value.

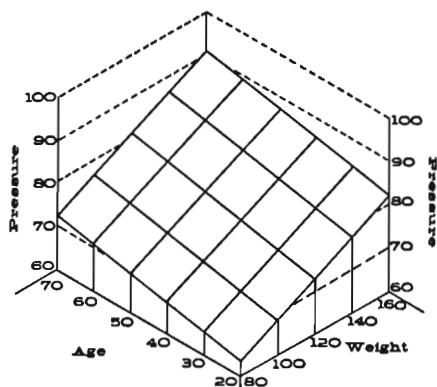


Fig. 2. Fitted values of right diastolic pressure (fifth phase) as a function of age and weight in adult male Bengalis. (Refer to the explanatory legend for figure 1.)

males and females classified by age and weight. The fitted diastolic pressures are represented graphically in figure 2 for males, using the same conventions as in figure 1.

The relative importance of age and weight in predicting blood pressure for these subjects is shown by the standard partial regression coefficients:

- (i) Systolic pressure, males, for age .4074, for weight .2354;
- (ii) Systolic pressure, females, for age .3926, for weight .1283;
- (iii) Diastolic pressure, males, for age .2334, for weight .3476; and
- (iv) Diastolic pressure, females, for age .2984, for weight .1988.

Discussion

When individuals are classified according to age, it has been amply demonstrated that the mean values of systolic and diastolic pressure will rise as age increases. In such widely varying geographic regions as London, England and Assam, India, the trends are similar and the mean values do not differ greatly (*Pickering*, 1961). In a previous report on blood pressures of adult male Bengalis (*Das*, 1960), Bengali pressures were compared with English pressures (*Hamilton et al.*, 1954). Bengali systolic pressures were approximately 10 mm

lower from 20 to 30 years of age, and approximately 20 mm lower from 50 to 60 years of age; the diastolic pressures did not differ markedly except for 50 to 60 years old for which the English values were higher. Considering only the mean rise in blood pressure with age, the present data may be compared with earlier Bengali data (Das, 1960). The differences between the two sets of values are less than 5 mm for 10 out of 11 age groups for both systolic and diastolic pressure. Comparison of the present data with the English data for male subjects yields the same conclusions as reported earlier (Das, 1960). While comparison of the diastolic pressure for Bengali and English female subjects yields conclusions similar to those drawn for males, systolic pressures show more marked differences. Up to 50 years of age the Bengali values are generally 10 mm lower, but after 50 years the differences increase rapidly up to 30 mm for subjects aged 65 to 70.

Methodological consideration of the relationships between the fourth and fifth phase values also served as an objective in this study. As would be expected, fourth phase values are higher than those for the fifth phase; for the present data, the average difference was 5 mm, for right and left arms in both male and female subjects. Reference to table V shows that this difference is statistically significant ($P < .01$). At the same time, a high degree of consistency between values obtained by the two criteria was obtained over the entire sample, as shown by the high and significant correlations in table V. Values for the left arm were higher than the values for the right; this effect was independent of the order of measurement. Values for the two arms differed significantly for the fifth phase in both males and females, and for the fourth phase in males only.

The increase in mean pressure with age was illustrated in table I and was confirmed statistically in table III. When the same subjects were reclassified according to weight, mean pressure was observed to increase with weight (tables II and IV). The interpretation of these two trends depends upon whether age and weight are correlated; if they are, then possibly the changes in blood pressure accompanying changes in one factor (say, weight) could be attributed to changes occurring in the other factor (say, age). Table VI shows that age and weight were not significantly correlated in these subjects, and hence, an alternative interpretation becomes necessary. The present data suggest that age and weight can independently influence blood pressure. Other data should be collected to de-

termine whether this suggestion is valid, but it should be stressed that actual weights, not weights corrected as "underweight" or "overweight" according to age, should be recorded along with age in collecting and analyzing the data. It may be noted that the majority of subjects in this study could not be regarded as obese.

To illustrate how these two factors influence blood pressure, figures 1 and 2 have been drawn showing systolic and diastolic pressure as surfaces rather than as lines. These surfaces represent the fitted values for males given in tables VII and VIII, and the slope of the surface is a function of both age and weight. The figures show how, on the average, holding one factor constant, increases in the other factor are accompanied by increased pressure, and how, as both factors increase in magnitude, blood pressure also increases. The degree of correspondence between the observed and fitted values is indicated by the significant multiple correlation coefficients.

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Summary

Blood pressure determinations were made for a sample of villagers residing near Calcutta, India. Right and left systolic and diastolic pressure were determined by the auscultatory method, using both fourth and fifth phase criteria for diastolic pressure; weight and height were measured; and age was recorded for 382 males and 625 females ranging in age from 15 to over 70 years. Analysis of the results indicated that all measures of blood pressure showed a significant mean increase with age ($P < .01$) and also with weight ($P < .01$). The effect of weight on blood pressure could not be attributed to changes in weight with increased age, as age and weight were not significantly correlated. Bivariate surfaces, illustrating the effect of both age and weight on systolic and diastolic pressure have been generated using values computed by multiple regression equations.

Zusammenfassung

Es wurden Blutdruckmessungen gemacht an Bewohnern eines Dorfes in der Nähe von Kalkutta in Indien. Mit der auskultatorischen Methode wurde rechts und links der systolische und der diastolische Druck bestimmt. Als Kriterium für den diastolischen Druck wurde die vierte und die fünfte Phase bestimmt. Gewicht, Größe und Alter der 382 Männer und 625 Frauen wurden registriert, ihr Alter betrug 15 bis 70 Jahre. Die Resultate zeigten, daß alle Blutdruckmessungen im Alter einen signifikanten Anstieg

erkennen ließen ($P < 0,01$) ebenso bei zunehmendem Gewicht ($P < 0,01$). Der Einfluß des Gewichts auf den Blutdruck kann nicht als Folge der Gewichtsänderung im Alter angesehen werden, da Alter und Gewicht nicht in einem signifikanten Zusammenhang stehen. Die Darstellung mit 2 Variablen, welche den Einfluß vom Alter und vom Gewicht auf den systolischen und diastolischen Blutdruck zeigen, basiert auf Werten, die durch mehrere Regressionsgleichungen errechnet wurden.

Résumé

Les auteurs ont effectué la mesure de la pression artérielle sur un échantillon de villageois des environs de Calcutta. Ils ont déterminé, à droite et à gauche, les valeurs maximum et minimum par la méthode auscultatoire en utilisant à la fois les critères de la 4^e et de la 5^e phase pour la pression diastolique. Stature et poids ont été mesurés, et l'âge exact de 382 mâles et 625 femelles, de 15 à plus de 70 ans, a été établi.

L'analyse des résultats montre que toutes les mesures de pression artérielle augmentent en moyenne de façon significative avec l'âge ($P < 0,01$), ainsi qu'avec le poids ($P < 0,01$). L'effet du poids ne peut être attribué aux changements pondéraux des sujets au fur et à mesure qu'ils vieillissent, car il n'existe aucune corrélation significative entre l'âge et le poids dans l'échantillon étudié.

A partir des valeurs déterminées par régressions multiples, un diagramme à trois dimensions a été construit, qui illustre à la fois les effets de l'âge et du poids sur les pressions systolique et diastolique.

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