BLOOD PRESSURE FINDINGS IN PORTO RICO

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There is a widespread opinion that blood-pressure findings in the tropics are low. From a casual observation we were inclined to concur with this viewpoint. Statistics of blood pressure readings in Porto Rico, however, were not obtainable; so in order to have a somewhat more definite idea on this matter we reviewed the blood pressure of one hundred consecutive hospital patients. We eliminated only those cases with heart disease, nephritis, pregnancy, and sprue. No deaths were included in this group.

In a study of blood pressures it would be better to consider normal individuals, but this data was not to be had. It will be noted by referring to Table I that our group ranged in age from 7 to 74; that the greatest number were between the ages of 11 to 60; and that a large number of them were not suffering with serious illnesses, constituting a characteristic group. The blood count in the majority of them is relatively low, the average being about 3,500,000. Eighteen per cent have counts below 3,000,000, and ten per cent have hemoglobins of fifty per cent or less.

It is an established fact that people who have lived in the tropics some years have a red blood count around 3,500,000. This figure we accept as normal. In chronic anemias we might expect a low blood pressure because of the lowering of the vitality of the heart muscle from insufficient nourishment. Referring to Table I it will be seen that this assumption does not hold for this group. The individuals with secondary anemia run a blood pressure well within the average for this group.

In connection with the question of anemia and low blood pressure it might be of interest to mention that in sprue, where the secondary anemia is marked and a constant factor, we do find a persistent hypotension—a systolic around 80. Because of this fact we felt sprue cases should be eliminated from our group. The prevalance of sprue in Porto Rico may be one reason for the opinion that blood pressures are low here.

Factors that influence blood pressure are particularly the condition of the heart and the peripheral resistance. What effect climate, *per se*, may have is an unknown factor. It is true that many people

in the tropics suffer with chronic intestinal parasitical infections, with the associated anemia and debility, which could well play a factor. However, anemia alone apparently has no effect. The conclusion one would draw based upon this small group would be that climate, *per se* has no effect either.

The accompanying tables are self-explanatory. They show that for this group the average systolic pressure is 120.2 mm., the diastolic 73.8 mm., and the pulse pressure 46.4 mm. The average systolic pressure for the men is 120.7 mm.; for the women 120 mm.; the average diastolic for the men 75 mm., for the women 73 mm.; the average pulse pressure for the men 45.7 mm.; for the women 47 mm. There is a gradual increase in the average systolic pressure from 11 mm. during the first decade to 142 mm. during the seventh. In comparing the men and women according to decades (Table III) we find very little difference.

In a paper by William Lintz of Brooklyn, in International Clinics, Dec. 1927 (p. 176) the following statement is made: "The normal blood pressure for adult males below 30 is 120–130 systolic and 80 diastolic; between 50–60 the systolic is 140–160 and the diastolic 85–95". Our findings are slightly under these figures, the average for 21–30 being 117.3 systolic, and between 51–60–141 systolic. The diastolic finding is also lower.

Continuing from Lintz's article, "The average pulse pressure is 45, which increases 1 mm. every two years from 40–60, and 2 mm. each year after 60". Here our figures are somewhat higher.

Finally Lintz says, "In females both the systolic and diastolic pressures are about 7 mm. lower than for the corresponding ages in men". In our group they average about 3–4 mm. lower, except between the ages of 50–80, in which period our numbers are too few to be of value.

From this investigation one must conclude that while the averages in Porto Rico are perhaps below those for the United States, the difference is not great, and they are well within what should be considered as normal limits:

TABLE No. I

TABLE OF PATIENTS FROM WHOM DATA WAS OBTAINED, ARRANGED ACCORDING TO AGE

Total Number	Age	Number in each decade	Sex	Diagnosis	Blood pressure	Heart	Urine	Blood Count	Hbg. per cent
1	7	1	F	Abscess leg	110—80	0	0		
2	8	2	M	Chr. Tonsillitis	115—85	0	0	2,600	55
3	11	1	M	Fractured femur	100—50	0	0	3,500	80
4	13	2	M	Appendiceal abscess	115—70	0	0	2,360	50
5	16	3	M	Chronic Cholecystitis with stones	120—85	0	0	3,800	75
6	16	4	M	Right inguinal hernia. Hookworn	114—68	0	0	3,680	75
7	16	5	F	Chronic Tonsillitis	118—74	0	0		
8	17	6	M	Colitis (?)	104—58	0	0	3,900	76
9	17	7	F	Colitis (whipworm	145—70	0	0	3,500	70
10	18	8	F	Uretal Colic	110—70	0	0	3,100	70
11	18	9	F	Hare-lip	120—64	0	0	3,048	75
12	19	11	M	Chronic Tonsillitis	120—70	0	0		
13	19	11	M	Mastoid. Hookworn	110—60	0	0	2,700	65
14	19	12	F	Chr. bilateral salpingitis	118—80	0	0	4,400	78
15	19	13	M	Chronic Tonsillitis	110—60	0	Alb. & pus.	3,400	80
16	19	14	F	Ischiorectal abscess	115—70	0	Sug.		
17	19	15	F	Typhoid	100—40	0	Alb. traces.	3,400	70
18	19	16	F	Renal Colic. Whipworm	110—60	0	0	3,800	85
19	19	17	F	Veronal poisoning	115—78	0	0		
20	20	18	M	Malaria (chronic)	118—70	0	Alb. traces.	3,900	80
21	20	19	M	Chronic Tonsillitis	126—78	0	0		
22	20	20	F	Chronic Cervicitis	114—74	0	0	3,300	80
23	21	1	F	Intestinal Fermentation	110—65	0	0	3,200	80
24	21	2	M	Gastric Ulcer	110—75	0		3,200	70
25	21	3	F	Chronic Tonsillitis	108—78	0	0		
26	21	4	F	Ectopic	120—80	0	0	2,600	60
27	22	5	F	Acute Cholecystitis	115—75	0	0	2,240	60
28	22	6	M	Injury to arm	120—80	0	0	1,800	45
29	22	7	M	Inguinal Adenitis	118—80	0	0	3,100	75
30	22	8	M	Fracture	118—82	0	0	3,400	75
31	22	9	F	Stricture of ureter	102—70	0	0	3,300	75
32	23	10	M	Uraemia	118—80	0	0	3,130	70
33	23	11	M	Gonococcus infection	128—70	0	Pyelitis	5,000	110
34	24	12	F	Acute Salpingitis	106—80	0	0	3,500	65
35	25	13	M	Chronic Tonsillitis Lues (333 Kahn)	130—80	0	0		
36	25	14	M	Acute Polyarthritis	130—60	0	0	3,000	60
37	25	15	F	Chronic Tonsillitis	106—74	0	0		
38	26	16	F	Pellagra Lues 333 (Kahn)	160—82	0	0	3,000	75
39	27	17	F	Ischio-rectal abscess	130—90	0	Sugar Pos.		
40	27	18	M	Malaria-Blood pos	100—65	0	0	3,200	75
41	27	19	F	Chronic Salpingitis	105—74	0	0	3,200	75
42	27	20	M	Furunculosis of buttock	100—60	0	0	3,200	85
43	28	21	M	Right ing. adenitis	118—70	0	0	4,320	95
44	28	22	F	No diagnosis	123—82	0	Alb. & pus.	3,300	75
45	28	23	F	Salpingitis	112—78	0	0	4,260	64
46	28	24	M	Hydronephrosis	132—80	0	0	2,400	50
47	28	25	F	Malaria	100—60	0	0	2,000	45
48	28	26	M	Malaria	103—70	0	0	3,900	80

TABLE No. I—(Cont'd)

49	28	27	F	Chronic Cholecystitis	110—70	0	0	3,600	80
50	29	28	F	Nephrolithiasis	105—80	0	0	3,120	60
51	30	29	F	Bilateral Salpingitis	98—70	0	0	2,590	45
52	30	30	F	Elephantiasis	120—80	0	Alb. traces	2,300	55
53	30	31	F	Primary Anemia	90—40	0	0	2,800	55
54	30	32	F	Fibroid	114—84	0	0	3,400	60
55	32	1	M	Stone in rectal Ureter	128—98	0	0	3,700	70
56	32	2	F	Chronic Endocervicitis	95—65	0	0	3,200	70
57	33	3	M	Hydrocele	120—70	0	0	2,970	65
58	33	4	M	Bilateral Hernia	108—60	0	0	3,200	80
59	33	5	M	Hook and Whip. Lues 222 (Kahn)	120—70	0	0	3,360	80
60	35	6	F		170—100	0	0	3,200	80
61	35	7	M	Injury	124—80	0	0	3,200	80
62	35	8	F	Chronic Tonsillitis	105—40	0	0		
63	35	9	F	Chronic Constipation	98—55	0	0	3,100	40
64	35	10	F	Prolapse. Typhoid	124—80	0	Pyelitis	2,800	55
65	35	11	F	Chronic Endocervicitis	120—65	0	0	3,200	75
66	36	12	F	Ovarian Cyst	115—70	0	0	3,100	80
67	36	13	M	Varicose Veins	140—90	0	0	3,300	87
68	37	14	F	Hemorrhoids	145—82	0	0	2,800	45
69	37	15	M	Malaria	115—50	0	0		
70	37	16	M	Left Hydrocele	118—70	0	0	3,200	75
71	37	17	M	Inguinal Hernia	128—80	0	0	3,100	80
72	37	18	M	Old Fracture	122—84	0	0	3,700	90
73	38	19	F	Chronic Endocervicitis	108—68	0	0	3,300	70
74	40	20	F	Acute Salpingitis	100—60	0	0	3,000	65
75	40	21	M	Fractured femur	116—86	0	Alb. traces	3,600	80
76	42	1	M	Acute Intestinal obstruction	180—105	0	0	3,800	85
77	42	2	F	Chronic G. I. indigestion	130—80		0	3,250	80
78	42	3	M	Right Ing. Hernia	120—80	0	0	3,300	90
79	43	4	F	Fibroid	138—80	0	0	2,500	48
80	43	5	F	Hemorrhoids. Lues Kahn 333	120—80	0	Alb. & pus	2,900	80
81	43	6	F	Chronic Endocervicitis	110—85	0	0	3,600	75
82	45	7	F	Abscess right leg	125—55	0	0	3,140	70
83	46	8	M	Carbuncle of neck	112—62	0	0	3,100	85
84	47	9	M	Chronic Appendicitis	118—70	0	0	4,500	95
85	48	10	F	Chronic Endotrachelitis	122—78	0			
86	48	11	M	Hemorrhoids	120—88	0	0	3,080	55
87	48	12	M	Infected Hernia	140—90	Weak	Pyelitis	2,170	55
88	50	13	M	Empyema	140—60	0	0	3,000	40
89	50	14	M	Cong Dislocation right hip	105—70	0	0	2,600	60
90	52	1	M	Right Hydrocele	118—96	0	0	3,300	65
91	55	2	F	Carcinoma of breast	130—60	0	0	3,200	80
92	56	3	M	Left Ing Hernia	124—90	0	0	3,120	80
93	57	4	F	Prolapse	220—120		0	3,200	80
94	59	5	F	Prolapse	140—78	0	0	3,200	70
95	60	6	F	Epithelioma of face	120—78	0	0	3,200	80
96	60	7	M	Diabetes	138—78	0	Sugar		
97	66	1	F	Uncinariasis-Constipation	120—80	0	0	3,200	65
98	68	2	F	Fractured pelvis	140—80	0	0	3,240	80
99	71	1	M	Right Ing Hernia	140—80	Weak	0	3,000	70
100	74	2	F	Inguinal Hernia-Acute intestinal obstruction	145—60	0	0	3,800	83

TABLE No. II

Table showing average systolic pressure, diastolic pressure and pulse pressure for each decade

Decade	No. of Cases	Average Systolic	Average Diastolic	Average Pulse Pressure
1—10 years....	2	112.2	82.5	30
11—20 years....	20	115	66	49
21—30 years....	32	114.3	73.5	40.8
31—40 years.....	21	119.9	72.5	47.4
41—50 years....	14	127	77.4	49.6
51—60 years....	7	141	85.5	55.5
61—70 years.....	2	130	80	50
71—80 years.....	2	142.5	70	72.5

Total No. of cases—100

TABLE No. III

Table showing average systolic pressure, diastolic pressure and pulse pressure of the males and females separately in each decade.

Decade	Male				Female			
	No. of Cases	Average Systolic	Average Diastolic	Average Pulse Pressure	No. of Cases	Average Systolic	Average Diastolic	Average Pulse Pressure
1—10.....	1	115	85	30	1	110	80	30
11—20.....	10	113.7	66.9	46.8	10	116.5	68	45.5
21—30.....	13	117.3	73.2	44.1	19	112.3	74.3	38.0
31—40.....	11	121.7	76.1	45.6	10	118	68.5	49.5
41—50.....	8	129.4	78.0	51.4	6	124	76.3	47.7
51—60.....	3	127	88	39	4	152.5	84	68.5
61—70.....	0	0	0	0	2	130	80	50.0
71—80.....	1	140	80	60.0	1	145	60	85.0