

BLOOD PRESSURE AND MINERAL CONTENTS IN INHABITANTS OF POHNPEI ISLAND

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Introduction

To investigate the relation between hypertension and mineral intake, levels of blood pressure, urinary sodium, potassium and creatinine were measured many subjects living on Pohnpei Island (Federated States of Micronesia).

Subjects and Method

The subjects were 34 male students attending the College of Micronesia (COM) in Kolonia and 19 inhabitants (6 males, 11 females) Wone located in the Kiti Village.

In all subjects, blood pressure, height, weight and skinfold thickness were measured and urine samples collected. Blood pressure was measured using the χ system, an automatic blood pressure measurement system. This system was designed for a WHO co-ordinated CARDIAC study. Along with the pressure scale data collected, vascular sounds sampled by transducer in the cuff were changed to digital data and recorded by a data recorder. After the sample data were fed into a computer, blood pressure values were determined based on our laboratory's recognition standards (Mikami *et al*). Blood pressure was measured two times, with the pairs value taken as individual values in cases systolic blood pressure was low.

Skinfold thickness was measured by Harpenden Calipers, measurement points were the triceps and the subscapular.

Mineral contents in urine (sodium and potassium) were measured by the filter paper method (Takemori, 1980) while daily sodium and potassium excretion were estimated using Kawasaki's equation (Kawasaki *et al*, 1993).

Data from the COM male students were compared with the data from CCM (Community College of Micronesia) male students collected 9 years ago.

Results

Table 1 shows the average age, height, weight, skinfold thickness (triceps+subscapular), systolic blood pressure, diastolic blood pressure, Na/K, estimated daily sodium excretion and estimated daily potassium excretion by sex and district. Using an independent sample t-test, we investigated the difference in these averages among COM male students, CCM male students, Wone males and Wone females as shown in Table 2.

There were no hypertensive patients in this survey, nor were any significant differences in systolic blood pressure found in any group. For the results of urine sample analysis, however, a significant differences were found in Na/K between COM students and other groups ($p < 0.01$), in NaCl between Wone males and others ($p < 0.05$), and in K between COM students and others ($p < 0.01$).

Table 1. Results of anthropometric, blood pressure and mineral contents in urinary excretion data

COM (males)									
	age	height	weight	skin f.	s. b. p.	d. b. p.	Na/K	Nacl	K
number	34	34	34	34	34	34	34	34	34
avg	19.9	170.7	70.5	26.3	127.1	67.3	3.8	10.4	1.7
std	1.8	6.1	11.0	8.5	10.2	8.3	1.9	2.9	0.4
CCM (males)									
number	21	21	21	—	21	21	21	21	21
avg	24.6	168.5	69.9	—	122.0	68.4	4.8	11.6	1.7
std	9.2	6.6	8.6	—	17.2	11.9	2.6	5.9	1.1
Wone (males)									
number	6	6	6	6	6	6	6	6	6
avg	44.8	164.8	71.9	33.3	129.0	72.5	1.3	8.3	2.4
std	8.2	7.3	6.26	8.1	13.0	3.7	0.8	2.3	0.5
Wone (females)									
number	11	11	11	11	11	11	11	11	11
avg	29.6	149.9	71.1	53.0	123.6	68.1	2.2	11.4	2.4
std	11.5	3.7	13.8	13.1	14.8	8.1	1.0	2.4	0.5

Table 2. The difference of average among Pohnpei inhabitants using independent sample t-test.

	age	height	weight	skin f.	s. b. p.	d. b. p.	Na/K	Nacl	K
COM									
Wone (male)	***	***	NS	NS	NS	*	***	NS	**
Wone (female)	*	**	NS	*	NS	NS	NS	*	NS

(*** p<0.001 ** p<0.01 * p<0.05)

Discussion

While previous studies have found a correlation between blood pressure and age, obesity (Dyer *et al.*, 1990) and salt intake (Law *et al.*, 1991), this produce no such findings. We think that the students on Pohnpei Island were relatively advanced culturally and consume high levels of sodium and low levels of potassium. While the inhabitants in rural areas were less advanced and they continue to consume a traditional levels of diet. Consequently their excretion of sodium was lower and potassium excretion higher than those of the students'. Probably, this relationship has not changed over the last 9 years. We need further study to get investigate the relation between mineral contents and hypertension, such as prospective

study in rural and recent civilized areas in Pohnpei Island.

References

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