*Effect of a Low-Refined-Carbohydrate Diet Upon Nonfasting Blood Pressure**

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Introduction

Previous reports have attempted to analyze the effect of a low-refined-carbohydrate and relatively high-protein diet upon a host of *biochemical* mechanisms including nonfasting blood sugar,[1] calcium,[2] phosphorus,[3] calcium - phosphorus relationships,[4] and cholesterol.[5] Attention will now be directed to a consideration of diet with regard to the *physiologic* state.

There is quite a volume of published material regarding the relationship of diet to blood pressure. An attempt is made in this report to review this literature and to correlate the findings of the various experimental groups. Special emphasis is placed upon the not-too-well-publicized effect of a *low - refined - carbohydrate high-protein diet* upon blood pressure.

Review of the Literature

Although not an exhaustive search of the literature, this report covers the authoritative works concerning diet and blood pressure.

Effect of Diet Upon Blood Pressure

Effect of High Carbohydrate Intake Upon Blood Pressure: A dramatic interest in treating hypertension by dietary means was stimulated by Kempner's work which began appearing in 1944.[6-12] The diet, according to Kempner, is designed to correct renal metabolic dysfunction by the limitation of protein, salt, and fluid. The diet consists of rice, fruit, fruit juices, sugar, and adequate vitamins and iron. Although this diet is relatively low in calories (2,000), the carbohydrate content is quite high (sugar 100 grams or more, rice 250-350 grams daily). Kempner concludes that the reduction in blood pressure is due to a decrease in the metabolic functional load of the kidney by the rice-fruit regime. The findings of other investigators are by no means negative, although few have observed such striking results.

Kempner[9] studied 172 hypertensive patients on a diet consisting of rice, sugar, fruit and fruit juices, supplemented by vitamins and iron. The patients followed the diet for periods varying from 4 days to 32 months. In 107 of the patients (64 percent) there was marked improvement. The average blood pressure in this group decreased from 200/122 mg. Hg to 149/96 mm. Hg after a mean time of 62 days on the diet.

According to one review,[13] the Kempner rice-fruit diet can be expected to produce a considerable fall in blood pressure in about 70 percent of patients with either renal or essential hypertension, provided there is strict adherence to the dietary regime. The blood pressure change is often accompanied by great symptomatic relief. Numerous other investigators (many not included in this report) have also noted improvement clinically in hypertensive patients on the Kempner rice-fruit diet.[14-17] However, different estimates of the percentage of patients

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showing improvement have been made. Shields and his group[14] state that both objective and subjective improvement can be expected in 65 percent of the cases. Loofhourow, Galbraith, and Palmer[15] give 37 percent as the number of improved hypertensive patients who adhered to the rice diet. The clinical success of the rice-fruit regime is attributed to a restriction of sodium, but not chloride, intake.[17,18] Ayman[19] adds that some overlooked variables, in the cases where low sodium intake is reported to lower blood pressure, may be the primary reason for lowered readiugs. Factors such as reassurance, relaxation, enthusiasm on the part of the patient all play a part in the observed reduced readings. Schroeder and co-workers[20] and Currens[21] report that occasional patients have been observed with a dramatic fall of blood pressure on a salt-free Kempner regime. However, in the majority, the blood pressure decreases little, if any.

Thus, there is no general agreement as to the effectiveness of the Kempner diet in reducing blood pressure.[22]

Effect of Low-Protein Intake on Blood Pressure: Handler and Bernheim[23] found that the systolic blood pressure for hypertensive rats on a high protein diet was 168 mm. Hg. For a medium protein intake the pressure was 145 mm. Hg and for a low protein intake, 122 mm. Hg. With partially nephrectomized rats, Handler and Bernheim[24] showed that the ingestion of low protein diets supplemented with choline and cystine results in the disappearance of hypertension. Choline, however, when fed in excess, produced hypertension. The conclusion is drawn that these relationships are due to failure of the anterior pituitary to manufacture ACTH because of the low protein intake. In contrast, Page and Lewis[25] found no significant changes in the blood pressure of dogs on high and low protein diets.

It is the general consensus of the majority of investigators reviewed here [26-29] that there is no evidence to show that a low protein diet would raise or reduce the blood pressure.

Effect of High Protein Intake Upon Blood Pressure: There is also some disagreement as to the effect of high protein intake upon blood pressure. Allen and Cope[30] are of the opinion that, in dogs, there is a reduction in blood pressure when a high protein dietary regime is followed. Breed[31] takes the opposite viewpoint and states that an excess of protein causes a marked rise in blood pressure.

The majority of observers conclude that there is no marked change in the blood pressure in normal or hypertensive dogs by high protein intake.[32-34] In rat experiments there is a difference in opinion. Some groups contend that, in both normotensive and hypertensive rats, the blood pressure tends to vary directly with the protein content of the diet.[23,35] On the other hand, Danford[36] found that dietary casein (18 percent) exerted no influence on the hypotensive response to sodium chloride restriction in hypertensive rats.

Saile [37,38] has shown that meat eaters have a much higher average blood pressure than vegetarians. Dubey,[39] in a study of industrial workers of Kanpur, was unable to detect any difference in the blood pressure of vegetarians versus nonvegetarians. On the other hand, Alvarez[40] reports that a group of anthropologists who have been studying primitive Eskimos who live almost exclusively on meat, fish, and fat have found low average systolic pressure and very little hypertension. The average pressure of 823 Eskimos was 110/71 mm. Hg. Harris and co-workers[41] conclude that there is an inverse relationship of the amount of dietary protein versus the arterial blood pressure. Also, if a high protein diet is given, there is a fall in the blood pressure only when there is a rise in NPN. Another group are of the opinion that there is no relationship

between high dietary protein intake and blood pressure.[26,29,42]

Regarding both lower animal and human studies, the pressor or depressor effects of variations in protein intake in hypertensive subjects have not been adequately separated from the effects of other variables.[22] The evidence at hand does not seem to support the view that the protein intake is of any great consequence in the initiation or maintenance of hypertension.

Effect of High-Carbohydrate Low-Protein Intake Upon Blood Pressure: Klinefelter,[43] using a low caloric diet rich in fruits and poor in meat, fat, and salt demonstrated a beneficial effect upon blood pressure in a study of 600 hypertensive patients between 40 and 65 years of age. A low caloric diet, rich in meat, fat, and salt, did not affect the blood pressure.

Miscellaneous Dietary Alterations: Lee and coworkers,[44] in a study on 27 albino rats, found that after six weeks the rats which received pteroylglutamic acid developed a significant hypertension. The rats with diets devoid of petroylglutamic acid showed no elevation in blood pressure.

Rowland[45] reports success in lowering the blood pressure of obese patients when the conditions are due to an excess consumption of food. The average reduction in weight was 20.06 pounds, in systolic pressure 40.85 mm. Hg, and in diastolic pressure 17.32 mm. Hg. Fletcher[46] showed a statistically significant ($P<.001$) reduction in systolic and diastolic blood pressure in reducing women. Forty-eight cases of hypertension have been studied and treated by Hartsilver[47] by providing them with so-called semi-starvation diets. The diet consists mainly of water, sugar, fruit juices, and vegetable soup. The blood pressure fell rapidly in 90 percent of the cases. The hypotensive effect of prolonged semistarvation appears to be reversible. Refeeding causes a prompt return of blood pressure to previous or to even higher levels.[48,49]

It was undoubtedly Allen and his co-workers[50] who first brought the therapeutic possibilities of rigid salt restriction to the attention of the American medical profession. The rationale for this dietary regime is to spare the kidney, by limiting the salt intake as much as possible, in the hope that the decreased renal work load would abolish the pressor activity of the overworked kidney. Many investigators feel as though sodium plays a larger role than the chlorides in reducing hypertension.[51-55] Whether sodium and chloride ions exert independent pressor effects in the human being, and whether depletion of such ions is capable of lowering the blood pressure in the human hypertensive subject, are still matters on which there is no general agreement.[22]

Cornwall[56] states that it may be sufficient to restrict the animal flesh in the diet to comparatively small amounts, perhaps allowing it only two or three times per week. Eggs are allowed in moderation in the treatment of hypertension. Chopra and group[57] report that people on a mixed diet have a higher pressure than those on a vegetable diet.

Perera[58] has shown that a restriction of dietary potassium was followed rapidly by small but significant decreases in the resting blood pressure of hypertensive patients.

During a six-month observation period, 215 Negro applicants were rejected by E. I. DuPont Company. All but 83 were hypertensive as reported by Ackerman and Lee.[59] The dietary history of these subjects shows that it consisted of an enormously high fat intake, such as "fatback," and very little protein. Nevertheless, the role of fat and cholesterol intake has not been sufficiently clarified in relation to hypertension.

There is no convincing evidence that any of the vitamins is important

either in the etiology or in the therapy of hypertension in human beings.[22]

In a review by Page, Corcoran, and Taylor,[60] they state that there is no method short of trial which will tell which patient will show a response, if any, to dietary measures.

Blood Pressure Criteria

Blood Pressure Homeostasis: Experimentally produced hypertension in dogs and rabbits shows the blood sugar in these animals not increased. They show normal endogenous adrenaline hyperglycemia upon the injection of morphine. The hypertension is, therefore, not due to an increased secretion of adrenaline.[61]

Mosenthal[62] concludes that an excess of blood sugar will not result in an increase in blood pressure. However, glucose tolerance tests by O'Hare[63] on 23 patients with chronic vascular hypertension show that 11 cases are potential diabetics. One hundred and sixty-one diabetics, ranging in age from less than 10 years to over 60 years, have been studied by Koopman[64] to determine the effect of sugar metabolism upon blood pressure. The young diabetics had a normal blood pressure, but, in the older patients with diabetes mellitus, hypertension is the rule. With the evidence at hand there seems to be little reason to accept the view that carbohydrate metabolism is abnormal in the patient with uncomplicated hypertension.[22]

Guirdham[65] has demonstrated the effect of sex hormones in lowering the blood pressure and has particularly shown the antagonizing effect of testosterone and estrogen on blood pressure in the same person.

Fasting Versus Nonfasting Blood Pressure: Wilhelmj, Carnazzo, and McCarthy[66] have studied the effects of fasting (3-6 weeks) and realimentation with high carbohydrate and protein diets on normal and sympathectomized dogs. When fasted normal dogs were fed high carbohydrate diets, the systolic pressure rose significantly above the control values while diastolic values remained stable. This same procedure in fasting sympathectomized dogs did not alter the blood pressure. High protein diets fed to fasting dogs produced a rise in blood pressure compared to the control levels; in fasting sympathectomized dogs no rise occurred.

In another study Wilhelmj, Gunderson, Shuput, and McCarthy[67] subjected dogs to prolonged fasts and then fed them high fat diets. Blood pressures, while on the high fat diet, were unpredictable.

Blood Pressure Normality: The normotension values of the femoral artery for several hundred normal dogs were found to average 120/90 mm. Hg. Hypertension in the dog is evidenced by systolic pressures from 150 to 180 mm. Hg.[68]

Two hundred and twenty rats of both sexes were used for a study by Berg and Harmison[69] to observe the effect of aging upon systolic blood pressure. Incidence of hypertension (>140 mm. mercury) was greater in males than in females and increased with advancing age. However, normotensive levels of blood pressure were essentially the same in young or aging rats.

Russek[70] and Bennett[71] share the opinion that standards of normality for blood pressure in the human are not known. Most authors define the normal blood pressure as 120 mm. Hg systolic and 80 mm. Hg diastolic. The dividing line for normal blood pressure versus hypertension is approximately 140/90 mm. Hg.[72,73] Many clinicians, nevertheless, do not wish to make a diagnosis of hypertension unless the pressures are somewhat beyond this borderline. Many have adopted the view that if a subjectively well and objectively robust individual has a slightly elevated blood pressure, then this pressure must be normal.[72,74] Masters, Dublin, and Marks[75] suggest that, since blood pressure readings at higher than common-

ly accepted ranges of normality are so frequent, the range of normal blood pressure should be reconsidered. These authors recommend that any reading within one standard deviation of the mean is probably within normal range and that it is not unreasonable to extend this normal range to cover 40 percent on either side of the mean.

A number of authors contend that statistical averages of groups of people which include hypertensives should not be used to establish normal blood pressure ranges. This group has established normal values by eliminating the people whose blood pressure is 140/90 and above. When this is done, the systolic is reduced to approximately 115 mm. Hg and the diastolic to 70.[76-78,103,104]

The general consensus is that blood pressure, both systolic and diastolic, increases with age.[75,79-88] Several authors take issue with this opinion and have shown that this age-blood pressure parallelism is lost when subjects with pressures over 140-150/90-95 are eliminated from the statistical analysis.[72,76,89] Miller[90] found no apparent constant variation in blood pressure between different age groups, and Hurst[91] states that there is no rise in blood pressure with advancing years from 17 to 40 years of age.

Statistical data are abundant to demonstrate convincingly the direct relationship between weight and blood pressure at any age.[92-100]

Considering mean systolic and diastolic blood pressures, men have higher pressures than women up to age 40-44. After page 45-49 years, women show higher mean pressures.[101-106]

Bogdanovitch,[94] Sundae,[98] and Short[107] have noted a direct relationship between blood pressure and height in children and adults. No such parallelism is evident from the works of Karpinos[96] and Schurman.[108]

Grollman[109] found that, after a meal, the systolic blood pressure usually rose. Groh[110] determined that, in the summer, systolic blood pressures are 4-6 mm. Hg higher and, in the winter, diastolic pressures are 1-2 mm. lower than during the other seasons. Campbell and Blakenhorn[111] have demonstrated a fall in blood pressure during sleep. The total reduction in systolic pressure may be as much as 20 mm. Hg. A number of investigations confirms that Western peoples have higher blood pressures and a higher incidence of hypertension than Eastern peoples.[112-115] Alvarez[116] has found that American Negroes have slightly higher blood pressures than whites and that the increase with age is faster (study of 6,225 prisoners and 422 guards). In a study of 11,490 persons from low income farm families by Gover,[117] it was noted that their mean systolic blood pressure was higher than recorded for urban groups.

Method of Investigation

Eighty-five ambulatory persons were studied with regard to their systolic and diastolic blood pressures as measured according to the following procedure.

The patient was seated for fifteen to thirty minutes before the sphygmomanometer cuff was applied and the blood pressure, in this study, was recorded in the left arm. The cuff was pumped up and the diastolic pressure recorded where the muffling of sound occurred. The pressure was then released for a few moments and then increased beyond the systolic point. Systolic blood pressure was recorded where the sound first begins.

The 85 persons studied may be divided into three groups. Group I (30 ambulatory dental patients) includes 15 female and 15 male individuals. The ages range from 13 to 80 with a mean age of 45.2 years. Group II comprises 30 male dental students. The ages range from 23 to 31 with a mean age of 25.5. Group III constitutes 25 laboratory personnel. The ages range

from 22 to 60 with a mean age of 33.5.

Each subject presented in the clinic at approximately 10:00 A.M. after a customary breakfast meal. After being seated for about 15 to 30 minutes, the systolic and diastolic blood pressures were recorded in the left arm. The scores so obtained will hereafter be referred to as based on a *regular* diet.

Each Group I and Group II subject was then given dietary instructions to follow for the next three days. Protein intake was encouraged. Specific instructions were given not to eat sugar and refined sugar products as well as white flour foods. Thus, principal attention was directed to the elimination of *refined* carbohydrates from the diet. Hereafter, this regime will be referred to as a *basic* or *preparatory* diet (preparatory to blood pressure determinations). Group III received no instructions.

Finally, each subject was instructed to return on the fourth day at 10:00 A.M. after breakfast based on the above recommendations. At this second visit, the systolic and diastolic blood pressures were again recorded in the left arm after the patient had been seated for 15 to 30 minutes.

All blood pressure measurements were made by the same individual (W.M.R.).

Three minutes after completion of the blood pressure measurements in the Group III subjects at each of the two visits, the test was repeated to establish its reproducibility. Figure 1 shows the initial *systolic* values on the abscissa and the repeat systolic scores (three minutes later) on the ordinate. The black dots represent the findings at the first visit; the open circles the second visit three days later. Figure 2 describes the *diastolic* findings. The great constancy of the values is underlined by the dramatic line of regression. The reproducibility of these observations is heightened by the coeffi-

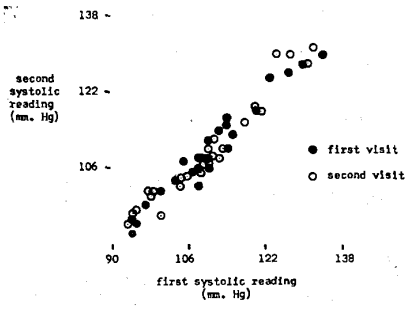

FIGURE 1. Comparison of first (on the abscissa) and second (on the ordinate) systolic blood pressure readings taken three minutes apart at two visits three days apart.

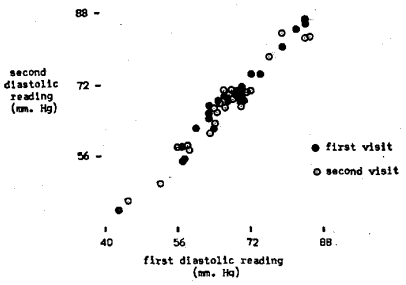

FIGURE 2. Comparison of first (on the abscissa) and second (on the ordinate) diastolic blood pressure readings taken three minutes apart at two visits three days apart.

TABLE 1

Comparison of Blood Pressure Between Two Successive Tests

First Test Versus Second Test	*Percentage of Cases*	
	Systolic Pressure	*Diastolic Pressure*
+6	2	0
+4	0	6
+3	4	6
+2	20	28
+1	10	20
0	8	10
—1	8	2
—2	36	26
—3	2	2
—4	8	0
—6	2	0
	100	100

cients of correlation of 0.976 and 0.978 for the systolic and diastolic relationships respectively and both with a $P<.001$. Table 1 summarizes the actual differences in mm. Hg between the two successive tests. Two points deserve mention. Firstly, the precise scores occurred only occasionally. Specifically, in only 8 (systolic) and 10 (diastolic) percent of the cases were the values identical. However, secondly, the principal variation was of the magnitude of 2 mm. Hg. Almost 9 out of every 10 of the scores differed by not more than 2 mm. Hg.

Results

The findings will be considered independently for the three groups.

Group I

The mean initial *systolic* pressure for the 30 dental patients proved to be 135.0 mm. Hg. Three days after subsisting on the preparatory diet, the mean *systolic* blood pressure decreased to 123.4 mm. Hg. Thus, during the three-day interval, the mean systolic pressure declined approximately 12 mm. Hg.

At the start of the experiment, the mean *diastolic* blood pressure for the 30 patients in Group I proved to be 81.5 mm. Hg. Three days after subsisting on the preparatory diet, the mean *diastolic* pressure decreased to 75.2 mm. Hg. Thus, during the experimental period, the mean diastolic pressure decreased approximately 6 mm. Hg or just about half the reduction in the systolic pressure previously noted.

The *systolic* scores obtained for the 30 patients initially and after the three-day dietary regime are pictorially reported in Figure 3. Shown along the abscissa are the initial systolic blood pressure findings. The differences between the initial scores and the findings three days later are charted on the ordinate. It is very clear from this graph that there is a definite line of regression. The coefficient of correlation for the entire group was found to be —0.716 with a $P<.001$.

Thus, the evidence seems reasonable that, under this dietary program, patients with systolic blood pressures above approximately 115 mm. Hg tend to be reduced to or about 115 mm. Hg. Also, it appears that those scores below this value tend to rise to or about 115 mm. Hg.

The *diastolic* scores obtained for the 30 patients initially and after the dietary regime are pictorially represented in Figure 4. Shown along the abscissa are the initial diastolic findings. The difference between the initial scores and the findings three days later are charted on the ordinate. It is very clear from this graph that there is a definite line of regression. The coefficient of correlation for the entire group was found to be —0.818 with a $P<.001$. Thus, the evidence seems reasonable that, under this dietary program, patients with diastolic pressures above 70 mm. Hg tend to be reduced to or about 70. Also, it appears that scores below this value tend to rise to or about 70 mm. Hg.

Group II

The mean initial *systolic* pressure for the 30 dental students proved to be 114.9 mm. Hg. Three days after subsisting on the preparatory diet, the mean systolic blood pressure declined to 111.7 mm. Hg. Thus, the overall decrease during the three-day interval was of the magnitude of 3 mm. Hg. It should be recalled that this is approximately a reduction of one-fourth that previously noted in Group I.

At the start, the mean *diastolic* pressure for the 30 dental students proved to be 72.9 mm. Hg. Three days after subsisting on the preparatory diet, the mean *diastolic* pressure decreased to 69.0 mm. Hg. Thus, the overall mean reduction was of the magnitude of 3 mm. Hg. It is noteworthy that this is very close to one-

half the reduction previously reported for Group I.

The systolic scores obtained for the 30 dental students initially and after the dietary regime are pictorially reported in Figure 3. Shown along the abscissa are the initial systolic blood

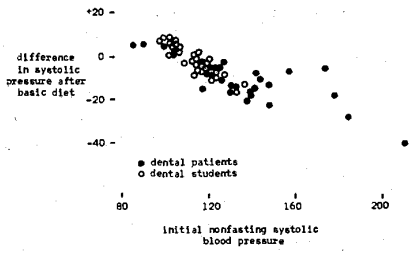

FIGURE 3. Comparison of systolic blood pressure initially (shown on the abscissa) and the difference (demonstrated on the ordinate) after the three day basic diet in 30 dental patients and 30 dental students.

pressure findings. The difference between the initial scores and the findings three days later are charted on the ordinate. It is very clear from this graph that there is a definite line of regression. The coefficient of correlation for the entire group was found to be —0.917 with a $P<.001$. Thus, the evidence seems reasonable that, under this dietary program, patients with *systolic* blood pressures above approximately 115 mm. Hg tend to be reduced to or about 115. Also, it appears that those scores below this value tend to rise to or about 115 mm. Hg.

The *diastolic* scores obtained for the 30 dental students initially and after the dietary regime are pictorially represented in Figure 4. Shown along the abscissa are the initial diastolic findings. The difference between the initial scores and the findings three days later are charted on the ordinate. It is very clear from this graph that there is a definite line of regression. The coefficient of correlation for the entire group was found to be —0.890 with a $P<.001$. Thus, the evidence seems reasonable that, under this dietary program, patients with diastolic pressures above 70 tend to be reduced to or about 70 mm. Hg. Also, it appears that scores below this value tend to rise to or about 70 mm. Hg.

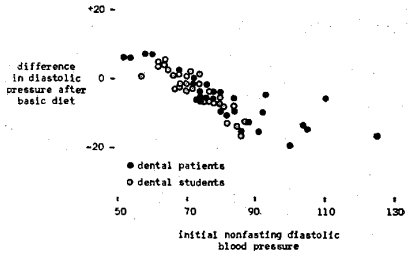

FIGURE 4. Comparison of diastolic blood pressure initially (shown on the abscissa) and the difference (demonstrated on the ordinate) after the three day basic diet in 30 dental patients and 30 dental students.

Group III

The mean initial *systolic* pressure for the 25 laboratory personnel proved to be 110.3 mm. Hg. Three days later the measure was 109.7 mm. Hg. Thus, the overall mean decrease during the three-day interval was of the magnitude of 0.6 mm. Hg. This, it should be recalled, is in contrast to 12 mm. Hg. (Group I) and 3 mm. Hg (Group II).

At the start, the mean *diastolic* pressure for this control group proved to be 67.5 mm. Hg. Three days later with no dietary change the mean *diastolic* pressure was 67.1 mm. Hg. Thus, the overall mean change was —0.4 mm. Hg. This, it should be recalled, is in contrast to 6 mm. Hg (Group I) and 3 mm. Hg (Group II).

The systolic scores obtained for the 25 control subjects at both visits are pictorially reported in Figure 5. Shown along the abscissa are the initial findings. The difference between the initial scores and the findings three days later are charted on the ordinate. It is very clear from this graph that there is no definite line of regression. The coefficient of correlation (—0.070) was found not significant ($P = .500$).

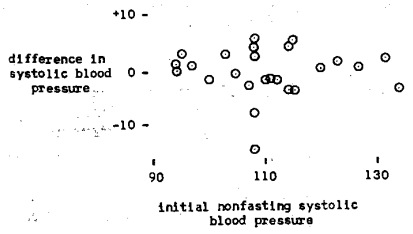

FIGURE 5. Comparison of systolic blood pressure initially (shown on the abscissa) and the difference (on the ordinate) three days later in the control group.

The diastolic values for Group III are plotted in Figure 6. The changes ($r = -0.185$ and $P > 0.200$) are also not significant for the diastolic determinations.

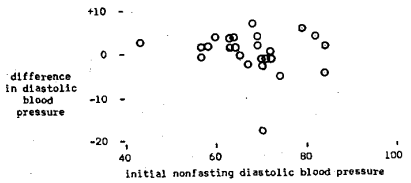

FIGURE 6. Comparison of diastolic blood pressure initially (shown on the abscissa) and the difference (on the ordinate) three days later in the control group.

Serial Studies

The question arose as to whether blood pressure changes would significantly differ if the diet were to be continued for longer than three days. To answer this question, 28 patients were studied initially (regular diet), three days later (basic diet), and again two to four weeks, and twelve weeks later on the same basic dietary regime. Systolic values of 136.0 ± 26.7, 124.9 ± 18.6, 118.2 ± 15.5, and 114.8 ± 3.2 were found respectively. For the diastolic pressure, the following values were obtained in order: 80.7 ± 13.2, 74.9 ± 8.2, 71.9 ± 8.3, and 69.0 ± 3.6. It would appear, on the basis of these data, that blood pressure changes continue beyond the three-day period originally studied. However, it also seems that the most pronounced alterations are observed during the first three-day interval.

Discussion

The evidence from these 85 subjects grouped in three categories indicates that there is a tendency for the systolic and diastolic pressures to approach approximately 115 and 70 mm. Hg respectively under the condition of a low-refined-carbohydrate dietary regimen. This is underscored by the relatively broad corrections in the dental patients (Group I), less but nonetheless significant changes in the dental students (Group II) and the lack of change in the control subjects (Group III). That the overall alteration, even when small, is significant is further shown by the fact that the experimental error in doing the test is even smaller.

Mention has already been made that there is no general agreement in the literature as to the effect of dietary carbohydrates and proteins upon blood pressure. In contrast, this report seems to suggest rather clearcut relationships. Two points in experimental design may account for the unusual results in this project. Firstly, major attention has been focused here upon the quality rather than the quantity of carbohydrate intake. It should be underlined that only *refined* carbohydrates have been eliminated. In contrast, attention in other reports has been largely directed to quantity (caloric) intake. A second unique feature of this investigation is that consideration has been given to *both* the elimination of refined carbohydrates *and* the encouragement of protein. Most of the other projects have concentrated attention upon *either* carbohydrates or proteins rather than upon the possible interplay between them.

This report should be viewed in the light of a number of limitations. Firstly, it would be interesting to repeat the project with a larger sample and by other investigators. Secondly,

the validity of the findings would be enhanced if the study could be carried out under conditions where the diet could be more rigidly supervised (e.g. metabolic ward). Thirdly, information suggesting a possible mechanism might be gained if renal function could be studied in parallel with pressor changes.

Summary

1. Nonfasting blood pressure analyses of 85 subjects were made initially (during a period of regular diet) and three days after a low-refined carbohydrate regime.
2. Evidence is presented to show that, under this dietary program, the nonfasting blood pressure tends to seek a more narrow range than is currently recognized.
3. It would appear, at least presumptively, that 115/70 mm. mercury would be the ideal (physiologic) nonfasting blood pressure level.

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