



Effect of Acidic and Alkaline Food on Human Body

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Abstract : *Based on the belief that certain food affects the pH of body fluid including that of blood and urine, a study was conducted to find out the effect of acidic and alkaline food on human body. 40 subjects of different age groups were selected. 30 of them were considered as test group and rest 10 were taken as control group. Test groups were asked to follow acidic diet plan and control groups were asked to follow normal healthy diet and sufficient amount of water for two weeks. pH of blood as*

well as urine was taken as measuring parameters. The variation in pH of urine was found significant and that of blood was not significant.

Key words: *acidic food, alkaline food, acidic waste, pH of blood, pH of urine.*

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Introduction :

The pH balance of the human blood stream is one of the most important biochemical balance in human body. Acid -alkali balance is extremely important to normal physiology. The blood maintains a slightly alkaline range of 7.35 to 7.45. Extended pH imbalances of any kind are not well tolerated by the body. Body metabolism therefore depends on the body being in equilibrium and operating at the right pH level, so that every function can work harmoniously (Frassetto et. al., 2007). All regulatory mechanisms (including breathing, circulation, digestion, hormonal production) serve the purpose of balancing pH, by removing caustic metabolized acid residues from

body tissues without damaging living cells (Strohle et. al., 2010). It has been suggested that an alkaline diet may prevent a number of diseases and result in significant health benefits. Dietary behaviour has shown to have influence on acid-base balance. (Fenton et. al., 2009). Our consumption of meat, processed food, sugar, alcohol and dairy is heavy, and each is hugely acidic when digested by the body (Reddy et. al., 2002). According to the latest research, the body now stores huge amounts of acidity in our fat cells, just to protect our kidneys from overworking and also to prevent kidney failure. Body acidity level is therefore also a major factor in putting on weight and increasing body cellulite (Sebastian et. al., 2002). Objective of our study was to confirm the effect of food habits on the body and probable diseases caused by it, to make people aware of importance of food habits of our forefathers instead of today's food habit and to focus on alkalising our body to maintain correct body pH levels. After review of literature on work done in this field it was found that there is dearth of references regarding effect of age , weight ,sex, blood group and body temperature on our body pH.

Material and Methods :

40 people of different age groups were selected. These people were divided on the basis of age in four groups. The first group consisted of people between 40-60 years of age, second group was of people between 21-30 years of age, third group was people between 9-20 years of age and the fourth group of 10 people of random age was taken as control group. The research was conducted for two weeks. With the help of dietician a diet chart of acidic and alkaline food was prepared. Initially pH of blood and urine of every subject was taken before diet chart was given to follow. pH of urine was taken twice a day and pH of blood was taken after one and two weeks. All the

readings taken during the observation were analysed and compared by t-test.

Result and Discussions :

Anything we eat affects our whole body system. In our research we included two important parameters – pH of blood and urine. None of the subjects showed abnormal values in any parameter investigated. There were no signs of severe acute or chronic disturbances in acid-base balance neither before and nor during the research. When we compared the measurements of pH of blood, we did not find any important regular deviation from the normal pH range of human blood (Table 1). When we performed t-test for pH of urine, we found it was significant (Table 2). pH of urine of test subjects varied very frequently as compared to the control group who were asked to follow a healthy controlled diet (Table 3).

Table.1. t-test for the comparison of pH of blood of control group and test subjects

t-Test: Two-Sample Assuming Unequal Variances		
	Variable 1	Variable 2
Mean	7.411	7.401666667
Variance	0.001104444	0.002212644
Observations	10	30
Hypothesized Mean Difference	0	
df	22	
t Stat	0.68769025	
P(T<=t) one-tail	0.249417356	
t Critical one-tail	1.717144335	
P(T<=t) two-tail	0.498834712	
t Critical two-tail	2.073873058	

Table.2. t-test for the comparison of pH of urine of test subjects and control group

t-Test: Two-Sample Assuming Unequal Variances		
	Variable 1	Variable 2
Mean	6.2	5.216666667
Variance	0.025	0.063505747
Observations	10	30
Hypothesized Mean Difference	0	
df	25	
t Stat	14.4719646	
P(T<=t) one-tail	5.8761E-14	
t Critical one-tail	1.708140745	
P(T<=t) two-tail	1.17522E-13	
t Critical two-tail	2.059538536	

Table.3. Average pH of urine of test subjects and control group

	Test Subjects of age group 40 - 60 years		Test Subject of age group 40 - 60 years		Test Subject of age group 9 - 20 years		Control Group	
	Morning pH	Evening pH	Morning pH	Evening pH	Morning pH	Evening pH	Morning pH	Evening pH
1	6	6.5	5	4.5	5	6	6	5
2	6	6.5	5.5	5	5.5	5	6	6.5
6	6	6.5	6	5	5	5	6	6
4	6	6	5	5	5.5	5	6	6.5
5	6.5	6.5	5	5.5	5.5	4.5	6.5	6
6	6	6	5	5.5	5	5	6	6.5
7	6	6.5	5	5.5	5.5	5	6	5
8	6	6.5	5	5.5	5.5	5.5	6	6.5
9	6.5	6	5.5	5	5.5	5	6.5	6
10	6	6.5	5	5.5	5	5	6	6.5

Thus, from above observations we can conclude that food habits certainly affect our body metabolism. In our study, which was carried for 14 days, we found that there was decrease in pH of urine of the subjects who were given acidic diet but the control subjects had normal pH of urine except those normal variations of morning and evening pH of urine. On the other hand we did not find any convincing change in the pH of blood in 14 days except for those minute variations within the normal pH range of blood buffer system i.e. 7.35-7.45. The modern diet results in our bodies have a low pH (acidic) level hence the importance of consuming pH-balancing nutritional supplementation increase along with changing our diet accordingly (Dawson et. al., 2008). A research carried out by Remer and Manz (1994) show that when low base forming and high acid forming food was given to 161 women of higher age, apart from the release of skeletal calcium to maintain acid-base balance and a low pH, it stimulates osteoclasts and inhibits bone matrix mineralisation. In their research they found lower urine pH in their subjects due to diet given to them. Another research carried out by Daniel et. al.,

(2009) showed that when alkaline minerals rich supplement was given to subjects their blood as well as urine pH increased significantly. The body has to rid itself of its acid wastes. This type of acid ash cannot be eliminated through the lungs as carbon dioxide and water in the same way as cellular metabolism. Instead the body has to buffer the ash with alkaline substances in order to neutralize it. Buffering takes place both inside and outside the cell, the majority of the buffering occurring in the blood itself (LU et. al., 1995).

Conclusion :

Though human body is made to maintain its alkaline pH between 7.35 to 7.45, the food we eat certainly affects our blood as well as urine pH. But our blood buffer system is so strict that it is not much affected by food habits. Since kidney is the main organ to observe acid load, through urine pH analysis our study showed food habit affects urine pH.

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