Coronary proneness and carbohydrate metabolism

GLUCOSE EFFECT ON DEXTRINIZATION TIME

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Current data on the rising incidence of cardiovascular disease have revealed a significant relationship between carbohydrate metabolism and some types of heart disease.[1-14] Because of dissatisfaction with current therapeutic results, attention is being directed to the development of a coronary proneness profile. Hopefully, knowledge of risk factors will lead to the prevention of coronary heart disease.[15-19] One approach to the evaluation of coronary proneness has been an investigation of the amyloclastic activity of saliva on starch,[20] a process referred to as dextrinization time and which is expressed in minutes. Limited evidence suggests that the shorter the dextrinization time the greater the coronary proneness.

This paper is a study of the possible effect of carbohydrate intake upon the dextrinization time.

Method of investigation Eighty-one healthy junior dental students participated in these experiments. Of the 39 individuals in Group 1, 23 received sucrose supplementation, and the remaining 16 served as controls. Each of the 23 subjects was given 50 gm. of chemically pure sucrose in solution twice daily from Monday to Friday for one week. The remaining 16 were given nothing. An additional 42 individuals in Group 2 shared in the second phase of the experiment. Twenty-one students were administered 225 gm. of glucose daily in dextrose drinks containing 75 gm. each and supplied thrice daily. The remaining 21 subjects were supplied with an artificially sweetened low-calorie solution indistinguishable from the glucose preparation at the

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Table 1 Dextrinization times (in minutes) with sucrose versus no supplementation

Sucrose group				*No supplement group*			
Case number	*Initial mean scores*	*Final mean scores*	*Differences*	*Case number*	*Initial mean scores*	*Final mean scores*	*Differences*
1	55	42	−13	1	54	42	−12
2	58	50	− 8	2	26	22	− 4
3	58	50	− 8	3	34	30	− 4
4	54	50	− 4	4	38	34	− 4
5	22	18	− 4	5	50	46	− 4
6	46	42	− 4	6	46	46	0
7	20	18	− 2	7	50	52	+ 2
8	30	30	0	8	38	42	+ 4
9	38	38	0	9	34	38	+ 4
10	34	34	0	10	53	58	+ 5
11	46	46	0	11	30	38	+ 8
12	30	30	0	12	42	50	+ 8
13	26	26	0	13	42	50	+ 8
14	32	32	0	14	26	38	+12
15	60	60	0	15	30	42	+12
16	50	50	0	16	42	54	+12
17	46	46	0				
18	26	28	+ 2				
19	42	46	+ 4				
20	26	30	+ 4				
21	46	50	+ 4				
22	38	46	+ 8				
23	30	42	+12				
Means	39.7	39.3	− 0.4		39.7	42.6	+ 2.9
Standard deviations	12.5	11.2			9.3	9.3	
Percentage changes		−1%				+7%	
P		>0.500				<0.100	
Increase		6 (26%)				10 (63%)	
No change		10 (43%)				1 (6%)	
Decrease		7 (31%)				5 (31%)	
Total		23 (100%)				16 (100%)	

chi square = 7.688
P <0.025*

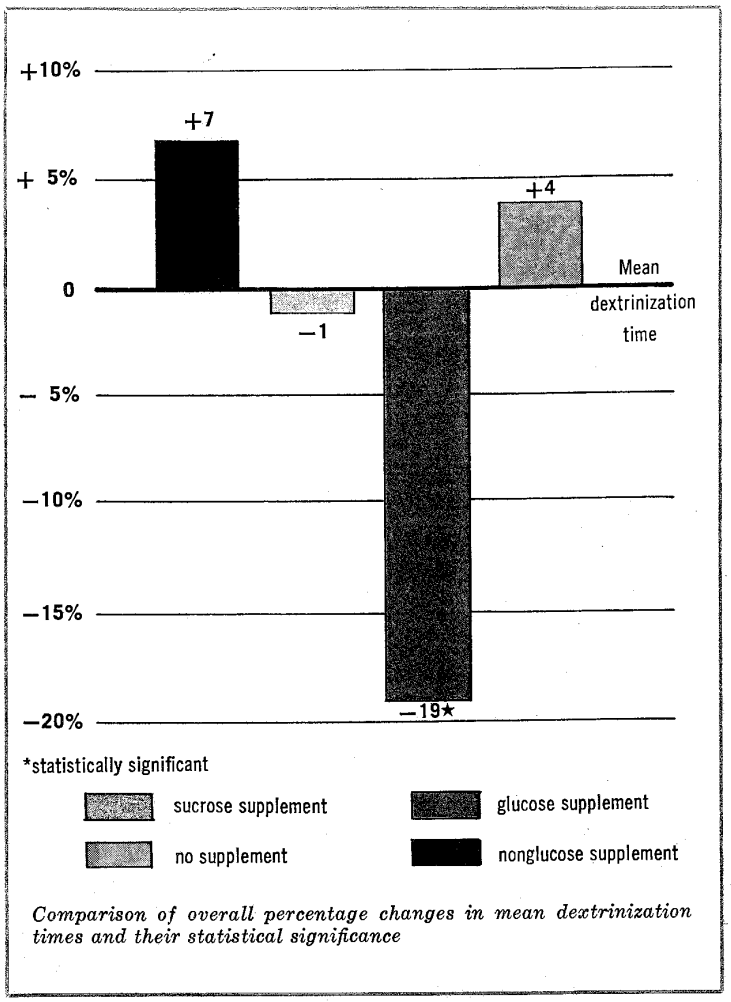
*Statistically significant

Table 2 Dextrinization times (in minutes) with glucose versus nonglucose supplementation

Glucose group				*Nonglucose group*			
Case number	*Initial mean scores*	*Final mean scores*	*Differences*	*Case number*	*Initial mean scores*	*Final mean scores*	*Differences*
1	38	46	+ 8	1	26	54	+28
2	34	38	+ 4	2	42	60	+18
3	30	34	+ 4	3	34	46	+12
4	38	38	0	4	34	38	+ 4
5	24	24	0	5	46	50	+ 4
6	24	24	0	6	34	36	+ 2
7	22	18	− 4	7	22	22	0
8	38	34	− 4	8	38	38	0
9	46	40	− 6	9	34	34	0
10	30	24	− 6	10	46	46	0
11	46	38	− 8	11	38	38	0
12	38	28	−10	12	58	58	0
13	38	28	−10	13	60	60	0
14	34	24	−10	14	26	26	0
15	34	22	−12	15	24	24	0
16	38	26	−12	16	26	26	0
17	60	46	−14	17	60	60	0
18	38	24	−14	18	48	46	− 2
19	56	38	−18	19	38	34	− 4
20	46	26	−20	20	48	40	− 8
21	60	34	−26	21	60	36	−24
Means	38.7	31.1	− 7.5		40.1	41.5	+ 1.4
Standard deviations	10.7	8.1			12.4	12.2	
Percentage changes	−19%				+ 4%		
P	<0.001*				>0.500		
Increase	3 (14%)				6 (29%)		
No change	3 (14%)				11 (52%)		
Decrease	15 (72%)				4 (19%)		
Total	21 (100%)				21 (100%)		

chi square = 11.940
P <0.005*

*Statistically significant



Comparison of overall percentage changes in mean dextrinization times and their statistical significance

same intervals for the same five-day period. On Monday and Friday of the experimental week fasting saliva was obtained and the dextrinization time determined.[20]

Results The initial and final dextrinization times for all subjects are listed in Tables 1 and 2 as well as the mean scores, standard deviations, percentage changes, significance of the differences of the means, and chi-square analyses. In Table 1, neither the 1% decrease in mean dextrinization time with sucrose supplementation ($P > 0.500$) nor the 7% increase in mean dextrinization time ($P > 0.100$) is statistically significant. In Table 2, the 4% rise in mean dextrinization time with the low-calorie drink (nonglucose supplemented group) is not significant ($P > 0.500$), but the 19% reduction in mean dextrinization time with the glucose supplement is statistically significant ($P < 0.001$).

Discussion The overall percentage changes in mean dextrinization times and their statistical significances are shown in the figure. It is clear that there is a significant alteration following the glucose supplement. Within the limits of this study, it would appear that dextrinization time can be reduced by the addition of 225 gm. of glucose as a daily supplement for four days. If it is true that the shorter the dextrinization time the greater the coronary proneness, then the evidence presented here suggests that coronary proneness can be encouraged by dietary change.

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