

# Comparative Microhematocrit Values of Spanish Americans and Whites Attending Los Angeles County Youth Clinics

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THE MICROHEMATOCRIT LEVEL has been widely employed as one index of value in determining the health status of various population groups. It is particularly valuable in the diagnosis of anemia predominantly nutritional anemia secondary to dietary iron deficiency. In a recent study of 74,027 apparently well children under age 6 from low and middle income families brought to 88 rural health centers in Tennessee, 18 percent were found to be anemic as judged by microhematocrit values of 31 percent or less (1).

One of the most extensive studies of blood microhematocrit levels in adults is the "Ten-State Nutrition Survey, 1968—1970" (2). In this study, microhematocrit levels were determined in more than 33,000 blood samples from males and females of all age groups; these subjects were drawn from diverse ethnic groups and from "low-income-ratio States" and "high-

income-ratio States." In the States identified as low-income-ratio States, more than half the families were classified as living at a "below poverty" level on the basis of a Poverty Income Ratio (PIR) for each family as proposed by Orshansky (3). In the high-income-ratio States, more than half of the families were classified as living "above poverty." The findings indicated that the blood microhematocrit levels for adults were consistently lower in the low-income-ratio States and were lower for Spanish Americans and blacks than for whites.

A major finding in this 10-State survey was the high prevalence of low or below-normal microhematocrit levels in both men and women in the age group 17 through 44 years. The finding obviously depends on what is considered to be a normal level, and this norm varies with sex and age. For adults, the average normal microhematocrit level stated in standard texts (4,5) is 47 percent for men (with a minimal normal of 42 percent) and 42 percent for women (with a minimal normal of 36 percent). In the 10-State survey, the mean microhematocrit levels of men and women aged 17 through 44 years were 1 to 2 percent lower than the average normal levels cited in standard texts.

If a microhematocrit level of 36 percent is considered to be the lowest normal for women 17 through 44 years, then approximately 6 percent of the white women in this age group in both the low-income-ratio States and high-income-ratio States had below-normal microhematocrit

levels in contrast to a prevalence in Spanish American women of 16.5 percent in the low-income-ratio States and 9.7 percent in the high-income-ratio States. A higher prevalence of below-normal microhematocrit levels in Spanish American men over that of white men aged 17 through 44 years was also noted in the low-income-ratio States, but the prevalence of below-normal microhematocrit levels in this age group was similar in Spanish American and white men in the high-income-ratio States.

In this paper, data are presented on the blood microhematocrit levels of Spanish Americans and whites of both sexes attending youth clinics in Los Angeles County.

## Methods

The subjects of this study were persons voluntarily attending two Los Angeles County youth clinics: (a) the Van Nuys Health Center Youth Clinic, which serves primarily a white population, and (b) the Northeast Health Center Youth Clinic, which serves primarily a Spanish American population. The youth clinics serve primarily persons in the 16- to 30-year age group. Most of the complaints treated by physicians in the clinics are related to sexual behavior, including venereal diseases, unwanted pregnancies, and requests for contraceptives. Young people come to the youth clinics for numerous reasons: lack of money (no charge is made for services rendered), confidentiality of services (no parental consent is required), alienation from traditional medical and social services, and an informal atmosphere (rock music,

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Dr. William Minkowski, chief, Youth Health Division, Bureau of Maternal and Child Health, Los Angeles County Health Department, arranged for the use of the facilities of the county's youth clinics. Mrs. Bonnie Lowry and Raymond Malinowski made the microhematocrit determinations reported in this study.

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comfortable furniture, and casual attire of the staff).

Persons attending the youth clinics constitute a highly select subgroup that may differ in a number of respects from others of the same age and ethnic and socioeconomic groups. The subjects of this study were the first 50 male and first 50 female Spanish Americans in the Northeast Clinic and the first 50 male and the first 50 female white persons in the Van Nuys Clinic, who, when randomly approached, agreed to participate in this study. Microhematocrit determinations were performed on free-flowing capillary blood taken from these subjects.

In the Northeast Clinic the women's ages ranged from 16 to 33 (average  $21.12 \pm 4.37$  years) and the men's from 17 to 56 (average  $24.44 \pm 6.93$  years). Of the 100 persons studied in this clinic, three women and five men were over 30 years old. In the Van Nuys Clinic the women's ages ranged from 16 to 29 (average  $18.88 \pm 3.23$  years) and the men's from 16 to 31 (average  $21.00 \pm 3.23$  years). Only one subject (a man) in the Van Nuys Clinic was over 30.

### Findings

A highly significant difference in microhematocrit levels between Spanish American and white persons was noted. Among the women, the mean microhematocrit level for Spanish Americans was  $40.22 \pm 3.63$  percent and for whites,  $38.38 \pm 2.78$  percent. Among the men, the mean level for Spanish Americans was  $45.46 \pm 3.26$  percent and for whites,  $42.80 \pm 2.32$

**Table 1. Cumulative percentage distribution of microhematocrit values of whites and Spanish Americans attending Los Angeles County youth clinics, by sex**

Microhematocrit values (percent)	White			Spanish American		
	Number	Percent	Cumulative percent	Number	Percent	Cumulative percent
<i>Women</i>						
Total .....	50	100	100	50	100	100
Less than 32 .....						
32 .....	1	2	2	1	2	2
33 .....	2	4	6			2
34 .....			6	2	4	6
35 .....	6	12	18	2	4	10
36 .....	1	2	20	3	6	16
37 .....	7	14	34	2	4	20
38 .....	12	24	58	8	16	36
39 .....	5	10	68	2	4	40
40 .....	5	10	78	7	14	54
41 .....	2	4	82	5	10	64
42 .....	5	10	92	5	10	74
43 .....	3	6	98	5	10	84
44 .....	1	2	100	1	2	86
45 .....				3	6	92
46 .....				2	4	96
47 .....				1	2	98
48 .....						98
49 .....				1	2	100
<i>Men</i>						
Total .....	50	100	100	50	100	100
Less than 36 .....						
36 .....						
37 .....	1	2	2			
38 .....			2	1	2	2
39 .....	1	2	4	3	6	8
40 .....	6	12	16			8
41 .....	6	12	28	3	6	14
42 .....	9	18	46	1	2	16
43 .....	9	18	64	4	8	24
44 .....	7	14	78	2	4	28
45 .....	7	14	92	10	20	48
46 .....	2	4	96	9	18	66
47 .....			96	5	10	76
48 .....	1	2	98	5	10	86
49 .....			98			86
50 .....	1	2	100	5	10	96
51 .....				1	2	98
52 .....						98
53 .....				1	2	100

percent. A *t* test for the difference in means between Spanish Americans and whites was performed for both sexes. For women a *t* value of  $-2.85$  was obtained ( $P = < .01$ ); for men the *t* value was  $-4.70$  ( $P = < .001$ ).

For both Spanish Americans and whites attending the clinics, the mean microhematocrit levels were less than the average normal levels of 42 percent for women and 47 percent for men cited in standard texts (4,5). A marked difference was observed in the prevalence of below-normal microhematocrit values (levels of less than 36 percent for women and less than 42 percent for men) between Spanish Americans and whites. Below-normal microhematocrit values were noted in 18 percent of white and 10 percent of Spanish American women and 28 percent of white and 14 percent of Spanish American men. The cumulative distribution of microhematocrit values of the Spanish American and white persons is shown in table 1.

## Discussion

The findings for the youth clinic patients are in agreement with those reported for the 10-State survey (2) with respect to the high prevalence of below-normal microhematocrit values in both male and female teenagers and young adults. They differ from the survey findings, however, concerning the comparative prevalence of below-normal microhematocrit values in Spanish Americans and whites. In the 10-State survey, the prevalence of values below 36 percent of women aged 17 through 44 years was higher among Spanish

Americans than among whites in both the low-income-ratio States and high-income-ratio States. The report of findings in the survey did not include data on the prevalence of microhematocrit values below 42 percent for men, but it did present data on the prevalence of values below 40 percent. For men aged 17 through 44 years, the prevalence of microhematocrit values below 40 percent was greater for Spanish Americans than whites in the low-income-ratio States, but it was comparable to that of whites in the high-income-ratio States.

The foregoing findings of the 10-State survey differ significantly from those of the present study of youth clinic patients. In this study, it was observed that the prevalence of below-normal microhematocrit values for white men and women was approximately twice that for Spanish Americans. A comparison of the prevalence of below-normal microhematocrit values in the present study with that of Spanish

Americans and whites aged 17 through 44 in the 10-State survey is presented in table 2. The prevalence of below-normal microhematocrit values for Spanish American women in the present study was almost the same as that for Spanish American women in the high-income-ratio States (which included California). The prevalence of below-normal microhematocrit values among white women in the present study, however, was nearly three times that of white women in the high-income States. The prevalence of microhematocrit values below 40 percent in Spanish American men in the present study (8 percent, table 1) was nearly four times that of Spanish American men in the high-income-ratio States.

No data are available to account for the higher prevalence of below-normal values among whites as compared with Spanish Americans attending the youth clinics. Genetic factors do not appear to be in-

**Table 2. Comparative prevalence of below-normal microhematocrit values among Spanish Americans and whites in Los Angeles County youth clinics and subjects 17 to 44 years old in the 10-State survey<sup>1</sup>**

Group	Below-normal microhematocrit values as percent of total	
	Whites	Spanish Americans
<i>Youth clinics subjects</i>		
Women <36 percent .....	18	10
Men <42 percent .....	28	14
<i>10-State survey subjects</i>		
Low-income-ratio States:		
Women <36 percent .....	6.2	16.5
Men <40 percent .....	4.3	15.6
High-income-ratio States:		
Women <36 percent .....	5.9	9.7
Men <40 percent .....	2.7	2.3

<sup>1</sup> "Ten-State Nutrition Survey, 1968-1970," reference 2.

involved, for in the 1968-1970 survey covering all age groups, the mean microhematocrit levels of whites did not differ significantly from that of Spanish Americans in any age group (2). In respect to socioeconomic factors the Van Nuys Clinic, which the whites attended, is located in a middle class neighborhood in contrast to the less affluent neighborhood surrounding the Northeast Clinic. Although locale does not necessarily indicate the socioeconomic background of those attending the clinic, there is no indication that the whites were poorer financially than the Spanish Americans. The medical problems for which both whites and Spanish Americans attended the clinic were primarily those related to sexual behavior and appeared to be comparable for both groups.

The possibility cannot be excluded, however, that a higher percentage of white than Spanish Americans may have had undetermined medical conditions that contributed to the lower microhematocrit values. Also, possible differences in the diets of the two groups deserve more study. Many teenagers and young adults subscribe to various food fads and cults. An extreme example of such fads is the Zen macrobiotic diet (6), which, if adhered to for a prolonged period, may result in anemia, emaciation, hypoproteinemia, hypocalcemia, scurvy, and other nutritional deficiencies. From available data it would appear that white teenagers and young adults, particularly the offspring of middle class families, are far more likely to adopt such bizarre food patterns of behavior than persons of minority

groups, including Spanish Americans of comparable age. Further studies are indicated to determine to what degree dietary differences might be responsible for the below-normal levels of whites attending the Van Nuys Clinic in contrast to that of Spanish Americans attending the Northeast Clinic and the whites studied in the 10-State survey of 1968-70.

The significance of a reduction of a few percentage points in blood microhematocrit levels cannot be properly evaluated at this time. Although the mean level of whites was significantly less statistically for both men and women than that of Spanish Americans in this study, it is uncertain and controversial whether this reduction was of sufficient magnitude to have physiological or clinical significance. There is no unanimity among authorities about the microhematocrit levels at which a diagnosis of anemia should be made or what constitutes a minimal normal level. From a public health point of view, however, the percentage of persons with "low" or below-normal microhematocrit values would appear to be a valuable indicator in the evaluation of various population groups. On this basis, considerable doubts can be raised concerning the health status of teenagers and young adults, both Spanish Americans and whites, attending Los Angeles County youth clinics.

### Summary

Determinations were made of the microhematocrit levels of 50 male and 50 female Spanish Americans and 50 male and 50 female white

persons selected at random at two Los Angeles County youth clinics. One clinic served primarily a Spanish American population and the other, primarily a white population. Among both men and women the mean level for whites was significantly less than that for the Spanish Americans. If microhematocrit levels below 36 percent are considered below normal for women and those below 42 percent below normal for men, the prevalence of below-normal microhematocrit levels among whites was 18 percent of the women and 28 percent of the men in contrast to a prevalence of 10 percent of the women and 14 percent of the men among the Spanish Americans. The findings are contrary to those which may have been anticipated on the basis of the "Ten State Nutrition Survey, 1968-1970."

### References

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