DICK'S TEST IN PUERTO RICANS*

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According to Rogers[1] and Castellani[2] scarlet fever occurs infrequently in tropical countries. Available statistics[3] show that this is true in the case of Puerto Rico.

While studying some phases of the streptococcus problem in the tropics we had the opportunity to study the Dick reaction in several hundred children of the nursery and public schools of Puerto Rico.

Material and Methods

Material.

The toxin used was standard scarlet fever toxin prepared by the National Institute of Health, Washington, D. C. Each cubic centimeter of the toxin contained 30,000 skin test doses (lot S.T. 3). The toxin was diluted with physiological saline 1 to 3,000, thus 0.1 cc. of this dilution contained one standard skin-test dose. Part of the diluted toxin was heated in an Arnold steam sterilizer at 100° C. for two and a half hours, to be used as a control.

Method.

One-tenth of the toxin dilution was injected intradermically on the flexor aspect of the right forearm and an equal amount of the heated toxin was injected intradermically on the flexor aspect of the left forearm. Reading was taken at 12, 24 and 48 hours and the final result tabulated as follows: Reaction less than 1 cm. was called negative. Swelling from 10 to 15 mm. was called +, from 15 to 20 mm. equals + + from 20 to 25 mm., + + +, 25 mm. and over, as those showing necrosis, + + + +. The results are shown in the following table.

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TABLE I

RESULTS OBTAINED IN DICK'S TESTS IN PUERTO RICANS TABULATED BY AGE AND INTENSITY OF REACTION

Age	No. of Cases	Total Negatives	Total Positives	+	++	+++	++++
Under 2 years...	19	10.53%	89.47%	0	10.53%	31.57%	47.37%
Over 2 years to 3 years.....	127	22.84%	77.16%	1.57%	13.38%	24.41%	37.79%
3 to 4 years....	246	27.66%	72.33%	4.47%	12.60%	23.97%	31.30%
4 to 5 years....	263	42.21%	57.79%	6.08%	13.30%	15.98%	22.43%
5 to 6 years....	95	51.58%	48.43%	8.4 %	15.79%	12.64%	11.6 %
6 to 7 years....	34	61.27%	38.22%	14.75%	14.75%	5.88%	2.94%
7 to 8 years....	28	64.28%	35.72%	3.57%	14.28%	10.71%	7.14%
8 to 9 years....	76	64.48%	35.42%	18.42%	3.93%	5.26%	7.86%
9 to 10 years...	85	72.94%	27.06%	12.82%	8.23%	3.53%	3.53%
10 to 11 years...	113	75.22%	24.78%	5.31%	10.61%	7.07%	1.77%
11 to 12 years...	88	70.44%	29.56%	14.74%	7.98%	5.67%	2.26%
12 to 13 years...	74	74.35%	25.65%	9.46%	4.05%	8.10%	4.05%
13 to 14 years...	32	75.00%	25.00%	3.01%	10.06%	3.01%	9.02%
14 to 15 years...	39	76.92%	23.08%	10.25%	5.13%	5.13%	2.86%
15 to 20 years...	186	81.16%	18.81%	7.53%	8.66%	1.67%	1.08%
20 to 30 years...	56	80.36%	19.64%	8.93%	5.35%	3.57%	1.79%
30 to 65 years...	17	88.24%	11.76%	0	11.76%	0	0
Totals.....	1,578	55.26%	44.74%	7.50%	10.79%	11.90%	14.55%

This table shows that skin reactivity of people living in Puerto Rico decreases markedly as age increases.

The percentage of reactors and the intensity of the reactions are more or less the same as those obtained by other authors in temperate climates as the United States of America.

TABLE II

RESULTS OBTAINED IN DICK'S TESTS IN PUERTO RICANS TABULATED BY AGE GROUPS

Age Grouping	Total	Per cent Negative	Per cent Positive	Number Negative	Number Positive
From 7 months to 2 years.....	19	10.53	89.47	2	17
Over 2 years and under 5.....	636	32.54	78.46	208	428
Over 5 years and under 10.....	318	61.65	38.35	197	121
Over 10 years and under 20.....	532	75.88	24.12	402	130
Over 20 years and under 30.....	56	80.30	19.64	45	11
Over 30 years and under 65.....	17	88.24	11.76	15	2
	1,578	55.26	44.74	869	709

Table II shows the results of 1,578 Dick's reactions in different age groups.

The skin reactivity of persons tested decreases as age increases in very much the same way as in people living in New York, Gary, Indiana, and Philadelphia, etc.

TABLE III

SUMMARY OF DICK'S POSITIVE REACTIONS FOR DIFFERENT COUNTRIES

Nationality	City	No. tested	Author	Year	Positives %
U. S. A.	New York	4,570	A. Zingher [8]	1924	34.5
U. S. A.	Gary, Indiana	6,452	M. G. Smythe and O. B. Nesbit [9]	1928	53
U. S. A.	Gary, Indiana	12,836	O. B. Nesbit [10]	1925	50
U. S. A.	Gary, Indiana	2,162	O. B. Nesbit [10]	1925	50
U. S. A.	District of Columbia	328	R. E. Dyer and B. T. Sockrider [11]	1925	81.4
U. S. A.	Philadelphia, Pa.	9,595	J. Norman Henry [12]	1934	45
Scotland	Edinburgh	187	W. T. Benson and G. W. Simpson [13]	1927	46
Brazil	Río de Janeiro	1,176	J. A. Doull et al [14]	1927	16.1
Argentine	Buenos Aires		J. M. Miravent and E. Chiodi [17]	1929	30.8
Scotland	Aberdeen	1,500	J. P. Kinloch et al [15]	1927	72.1
Japan	Manchuria	1,727	H. Nishimura et al [5]	1929	34.19
China	Manchuria	481	H. Nishimura et al [5]	1929	17.9
China	Manchuria		T. Lin [16]	1926	47
China	Peiping	646	M. Y. Dzen [6]	1928	46.4
China	Shanghai	1,396	D. G. Lai [7]	1931	50.8
China	Hongkong	921	L. J. Davis et al [4]	1935	19.1
Puerto Rico	San Juan, Bayamón, etc.	1,578	Present paper	1936	44.74

Table III shows the results of Dick's tests performed by different authors in different countries in a mixed population. Apparently in certain sections of China, the percentage of positive reactions is very low (Hong-Kong by L. J. Davis et al[4]; Manchuria by Nishimura et al[5]; Peiping by Dzen[6]; Shanghai by Lai[7]).

TABLE IV

RESULTS IN RELATION TO RACE

Race	No. Total	Negatives		Positives	
		Total	Percentage	Total	Percentage
White	1,048	588	56.29	460	43.61
Mulattoes	423	232	54.86	191	45.16
Negroes	107	52	48.88	55	51.12
TOTALS	1,578	872	55.26	706	44.74

Table IV shows Dick's skin reactions in Puerto Rico according to race. There is no appreciable difference in reactivity between the different race groups.

TABLE V

RESULTS IN RELATION TO SEX

Sex	No. Total	Negatives		Positives	
		Total	Percentage	Total	Percentage
Males	750	432	57.47	319	42.53
Females	828	440	53.26	387	46.74
TOTALS	1,578	872	55.26	706	44.64

Table V shows Dick's skin reactions in Puerto Rico according to sex. The skin reactivity is more or less the same, in both sexes.

TABLE VI

COMPARATIVE STUDY OF NEGATIVE SKIN REACTIVITY TO DICK'S TOXIN OF THOSE OF DOULL ET AL IN BRAZIL[4], ZINGHER[3] IN NEW YORK WITH THOSE OBTAINED IN PUERTO RICO

Age	Brazil	New York	Puerto Rico
5	50%	37.5%	51.58%
6	76.9%	48.7%	61.27%
7	76.4%	66.7%	64.28%
8	91.2%	64.7%	64.48%
9	86.3%	80.0%	72.94%
10-14	80.7%	87.1%	73.12%

Table VI shows skin reactivity to Dick's toxin of groups living in Brazil, New York and Puerto Rico. The figures in Brazil and Puerto Rico are more or less the same. The New York figures are lower in the ages of 5 and 6 years, but the difference is not marked enough to justify conclusions.

SUMMARY

One thousand five hundred and seventy-eight Puerto Ricans have been Dick-tested.

The results indicate that among young Puerto Rican children there is a definite skin susceptibility to the scarlet fever toxin.

The distribution of positive reactors and the intensity of the reactions in different age groups bears striking similarity to those reported by various authors working in temperate zones.

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