

BLOOD PORPHYRINS IN NORMAL PUNJABEES

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Summary

A quantitative estimation of erythrocytic copro and protoporphyrins was made in 25 normal Punjabees by spectrophotometric method of Rimington values. Erythrocytic protoporphyrin values ranged from 2.55 to 41.20 ug/m/100 ml. cells and erythrocytic coproporphyrin ranged from 0.00 — 1.36 ug/m/100 ml. cells. Results were found to be statistically significant.

Erythrocytic porphyrins are present normally in red blood corpuscles and participate in haemoglobin synthesis. They impart the colour to red blood corpuscles. Blood porphyrins levels are increased in certain anemias, chronic infections, porphyrias, lead poisoning and after the administration of certain drugs like griseofulvin. But to give correct weight to raised levels of erythrocytic porphyrins, it is essential to determine the base line and the range for normal individual. Although extensive work has been carried out all over the world to determine the normal levels of blood porphyrins, no such work has been done in the Indians. The present study is aimed at determining the levels of blood porphyrins in normal Punjabees.

Material and Methods

A quantitative assay of erythrocytic porphyrins was done in 25 healthy, normal persons of Punjabi origin with normal liver function tests and negative serological tests for syphilis. Persons, selected for this study, were those who had not been exposed to any drug for the previous three months.

Rimington's spectrophotometry method¹ was selected for the quantitative estimation of copro and protoporphyrins.

Observations

The results observed are tabulated below :—

TABLE 1

Showing the distribution by age.

Age in years	No. of cases
0 -10	3
11-20	5
21-30	6
31-40	9
41-50	1
51-60	0
61-70	1
Total	25

TABLE 2

Showing the distribution by sex.

	Male	Female	Total
Children	1	5	6
Adults	11	8	19
Total	12	13	25

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 Received for publication on 10—2—1975

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TABLE 3

The Copro and Protoporphyrin levels in the blood of 25 normal Punjabees

S. No.	Age / Sex	Veg/ Non-Veg.	Hb. gm %	Weight in Kgm.	Proto-porphyrin ug/100 ml. c.	Copro-porphyrin ug/100 ml.c.
1.	70 F	V.	11.5	46	16.37	0
2.	12 M	N. V.	12.0	30	22.48	0
3.	35 F	V.	10.0	45	10.7	0
4.	35 M	V.	11.5	57	15.1	0
5.	37 M	V.	13.5	56	5.58	0
6.	14 F	V.	9.5	29.5	3.9	0
7.	36 M	N. V.	14.0	40	25.38	0
8.	20 M	V.	13.8	39	12.57	0
9.	10 F	N. V.	11.5	20	16.45	0
10.	12 F	N. V.	12.8	29	31.88	0
11.	8 F	V.	13.8	40	33.84	1.36
12.	New-born F	V.	15.5	2.3	31.88	0
13.	26 M	N. V.	12.0	48	25.75	0
14.	35 F	V.	10.0	39	2.55	0
15.	40 M	N. V.	11.2	49	13.79	0
16.	39 M	N. V.	12.5	57	30.65	0.71
17.	24 M	N. V.	12.0	58	30.65	0.92
18.	35 F	V.	11.8	48	29.79	0
19.	50 F	V.	11.5	45	18.39	0
20.	29 F	N. V.	12.0	48	24.52	0
21.	35 M	V.	13.0	55	23.05	0.55
22.	25 M	V.	12.0	50	19.00	0
23.	29 M	N. V.	12.5	56	30.28	0
24.	20 F	V.	12.0	45	24.52	0
25.	26 F	N. V.	13.8	50	41.19	0

TABLE 4

Showing the ranges of levels of erythrocytic porphyrins.

Erythrocytic porphyrins	No. of cases	Mean	Range	S. D. \pm	S. E. \pm
Protoporphyrin	25	21.60	2.55-41.19	10.02	2.00
Coproporphyrin	25	0.14	0.00- 1.36	0.22	0.41

TABLE 5

Showing the values of Erythrocytic Coproporphyrin in healthy adults by different workers.

Investigator	Year	No. of cases	Mean	Range	S. D. \pm
Male Adults					
Watson ²	1950	20	0.3	0-1.0	0.4
Krammer ³ et al.	1954	20	0.8	0.3-1.2	0.3
Meduri et al ⁴ .	1958	15	1.1	0.3-2.5	0.7
Wranne ⁵	1960	20	1.3	0.7-2.3	0.4
Female Adults					
Watson ²	1950	30	0.7	0-2.0	0.6
Krammer et al ³ .	1954	10	0.7	0.3-1.1	0.2
Meduri et al ⁴ .	1958	15	1.3	0.5-2.8	0.6
Wranne ⁵	1960	20	1.2	0.3-2.3	0.7
Both Male & Female					
Rimington et al ⁶	1963	8	0.35	0-1.0	0.3
El-Mofty et al ⁷ .	1967	30	2.9	0-12.0	2.98

TABLE 6

Showing the values of Erythrocytic Protoporphyrin in healthy adults by different workers.

Investigator	Year	No. of cases	Mean	Range	S. D. +
Male Adults					
Watson ²	1950	20	29	24-42	4.5
Krammer et al ³ .	1954	20	31	14-55	11.9
Meduri et al ⁴ .	1958	15	30	18-49	10.7
Wranne ⁵	1960	20	30	16-52	7.5
Female Adults					
Watson ²	1950	30	42	32-52	5.9
Krammer et al ³ .	1954	10	45	23-79	19.6
Meduri et al ⁴ .	1958	15	31	21-47	8.1
Wranne ⁵	1960	20	37	18-51	10.0
Both Male & Female					
Rimington et al ⁶	1963	8	18.8	13.0-29.6	5.7
El-Mofty et al ⁷ .	1967	30	31.97	6.4-75.0	15.22

Comments

The erythrocytic coproporphyrin values in normal adults have earlier been reported by various workers. The mean erythrocytic coproporphyrin in our study was 0.14 ug_m/100 ml. cells. with a range of 0-1.36 ug_m/100 ml. cells. These findings are in agreement with those of other workers^{2, 3, 4, 5, 6, 7}.

The results of erythrocytic protoporphyrin values in normal adults have also been reported by various workers and it has been shown that there is great variation in the mean value and range in erythrocytic protoporphyrin. Similar findings are noted in our series where the values ranged from 2.55-41.2 ug_m/100 ml. cells with a mean value of 21.60 ug_m/100 cc cells. Thus our findings are in broad agreement with those of other workers²⁻⁷.

The review of literature indicates that wide range of variations in the normal levels of porphyrins is found not only at racial levels but also at individual levels thus making it difficult to draw any logical conclusion from a single determination. It is essential to estimate a given type of porphyrin in various media of the same individual over a period of time, and in a large

number of cases. The findings in the present study were statistically significant.

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