

A SPECTROPHOTOMETRIC STUDY OF PORPHYRINS IN PATIENTS WITH PSORIASIS WITH SPECIAL REFERENCE TO PHOTOSENSITIVITY

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Summary

Quantitative porphyrins in blood, urine and stools of 30 patients with psoriasis has been compared with that of 10 normal controls. Porphyrin levels have also been compared in psoriatic patients with and without history of photosensitivity. The erythrocyte coproporphyrin levels in patients with photosensitivity were higher than that in patients without photosensitivity, and this rise was statistically significant. However, psoriasis per se does not seem to affect porphyrin levels.

Porphyrins are intensely coloured macrocyclic tetrapyrrole compounds, widely distributed in animals, plants and micro-organisms. These are the by-products of haemoglobin biosynthesis, play a vital role in living cells and have well known photodynamic activity. There are many photosensitive dermatoses in which disturbances of porphyrin metabolism have been noticed. Mofty et al¹ reported increased porphyrin excretion in lupus erythematosus. Anandam² reported increased porphyrin excretion in polymorphic light eruption. There is history of photosensitivity in some cases of psoriasis. To the best of our knowledge, no known study has been carried out so far in patients with psoriasis in regard to their porphyrin assay. So the present study was undertaken to find out levels of porphyrins in blood, urine and stools

of 30 psoriatic patients and compare these with values in 10 normal individuals constituting the control group. Porphyrin levels have also been compared in patients with and without clinical history of photosensitivity in the study group.

Materials and Methods

The method of assay employed in the study was that of Rimington et al³ based on the Broadsheet 70 (Revised Broadsheet No. 36), August, 1971.

Thirty patients with psoriasis, three females and twentyseven males were selected for the study. The criteria for the selection of the psoriatic cases was based on clinical and histopathological features. A special note was taken of the cases with history of photosensitivity. Porphyrin estimation was carried out in dark room with all necessary precautions and the values were determined spectrophotometrically.

Observations

The results were analysed and tabulated below :

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TABLE 1

Showing blood porphyrins in study and control group in μg per 100 ml erythrocyte

Group	Number of cases	Range in μg	Mean	S. D.	S. E.
<i>Erythrocyte coproporphyrin</i>					
Study	30	0- 4.890	2.563	1.016	0.185
Control	10	0- 3.970	2.658	0.985	0.311
<i>Erythrocyte protoporphyrin</i>					
Study	30	3.200-15.260	7.164	3.025	0.552
Control	10	5.770-10.750	7.798	1.472	0.465

TABLE 2

Showing urinary porphyrins in study and control group in $\mu\text{g}/24$ hours

Group	Number of cases	Range in μg	Mean	S. D.	S. E.
<i>Urinary coproporphyrin</i>					
Study	30	12.260-67.500	32.531	12.345	2.253
Control	10	17.940-43.960	30.596	7.976	2.522
<i>Urinary uroporphyrin</i>					
Study	30	0-15.280	4.378	4.721	0.861
Control	10	0- 8.230	3.620	3.892	1.230

TABLE 3

Showing faecal porphyrins in study and control group in μg per gm dry weight

Group	Number of cases	Range in μg	Mean	S. D.	S. E.
<i>Faecal coproporphyrin</i>					
Study	30	0-4.100	2.397	0.828	0.151
Control	10	0-4.450	2.280	0.912	0.288
<i>Faecal protoporphyrin</i>					
Study	30	2.510-13.880	5.756	2.673	0.488
Control	10	2.780-11.530	6.409	3.092	0.977

Discussion

Since the porphyrins are known to induce photosensitivity, the aim of the present study was to find out if porphyrins were in any way concerned with light sensitivity in cases of photosensitive psoriasis and whether the disease process itself was associated with any alteration in porphyrin levels.

The values of mean and S.D. of erythrocyte coproporphyrin in study group

were 2.563 and 1.016, while in the control group these were 2.658 and 0.985 respectively. On comparison the value of "t" was 0.257 which is statistically insignificant. The values of mean and S.D. for erythrocyte protoporphyrin in the study group were 7.164 and 3.025 while in the control group these were 7.800 and 1.460, respectively. On comparison the "t" value was 0.630 which is statistically insignificant.

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TABLE 4

Showing erythrocyte porphyrins in patients with and without history of photosensitivity in $\mu\text{g}/100\text{ ml}$ erythrocytes

Group	Number of cases	Range in μg	Mean	S. D.	S. E.
<i>Erythrocyte coproporphyrin</i>					
Patients without photosensitivity	25	0-3.350	2.373	0.859	1.171
Patients with photosensitivity	5	0-4.890	3.530	1.247	0.557
<i>Erythrocyte protoporphyrin</i>					
Patients without photosensitivity	25	3.200-15.260	6.865	2.998	0.599
Patients with photosensitivity	5	6.360-11.320	8.658	3.016	1.348

TABLE 5

Showing urinary porphyrins in patients with and without history of photosensitivity in $\mu\text{g}/24\text{ hours}$

Group	Number of cases	Range in μg	Mean	S. D.	S. E.
<i>Urinary coproporphyrin</i>					
Patients without photosensitivity	25	12.260-67.500	32.605	12.561	2.512
Patients with photosensitivity	5	20.170-45.840	32.160	12.574	5.623
<i>Urinary uroporphyrin</i>					
Patients without photosensitivity	25	0-15.280	4.610	4.791	0.958
Patients with photosensitivity	5	0- 9.580	3.218	4.538	2.029

TABLE 6

Showing faecal porphyrins in patients with and without history of photosensitivity in μg per gram dry weight

Group	Number of cases	Range in μg	Mean	S. D.	S. E.
<i>Faecal coproporphyrin</i>					
Patients without photosensitivity	25	0-4.100	2.326	0.819	0.163
Patients with photosensitivity	5	0-3.700	2.754	0.863	0.385
<i>Faecal protoporphyrin</i>					
Patients without photosensitivity	25	2.510-13.800	5.624	2.615	0.523
Patients with photosensitivity	5	3.070-10.600	6.414	3.188	1.425

The values of mean and S.D. for urinary coproporphyrin in the study group were 32.531 and 12.345, while in the control group these were 30.596 and 7.976 respectively. The "t" value was 0.462 which is statistically insignificant. Similarly the mean and S.D. for urinary uroporphyrin in the study group were 4.378 and 4.721 while in the control group these were 3.620 and 3.892, respectively. On comparison the "t" value was 0.459 which is statistically insignificant.

The values of mean and S.D. for faecal coproporphyrin in the study group were 2.397 and 0.828 while in the control group these were 2.280 and 0.912, respectively. On comparison the "t" value was 0.377 which is statistically insignificant. Similarly the values of mean and S.D. for faecal protoporphyrin in the study group were 5.756 and 2.673 while in the control group these were 6.409 and 3.092, respectively. On comparison the value of "t" was 0.644 which is statistically insignificant.

In addition, a comparison was made between patients with and without history of photosensitivity. Five patients showed photosensitivity and 25 did not. On comparison the "t" value between the two groups for erythrocyte coproporphyrin was 2.554, erythrocyte protoporphyrin 1.228, urinary coproporphyrin 0.072, urinary uroporphyrin was 0.597, faecal coproporphyrin 1.059 and faecal protoporphyrin 0.596. All the values were statistically insignificant except those of erythrocyte coproporphyrin where the "t" value was statistically significant ($t = 2.554$) be-

cause the value was higher than the table values which is 2.04 for 28 degree of freedom at 95 per cent level of confidence.

The analysis of our observation reveals that there is no statistically significant difference in erythrocyte urinary and faecal porphyrins in cases of psoriasis as compared with that of normal individuals. In cases of photosensitive psoriasis erythrocyte coproporphyrins were significantly raised as compared with non-photosensitive psoriasis. However, erythrocyte protoporphyrins, urinary coproporphyrins and uroporphyrin and faecal copro and protoporphyrins in photosensitive psoriatic patients were not increased and showed no statistically significant variation from the majority of non-photosensitive psoriatic cases. It is obvious from the above study that psoriasis with photosensitivity seem to have a higher level of erythrocyte coproporphyrins which probably is responsible for light sensitivity in cases of psoriasis.

A study in a larger series of photosensitive psoriasis is indicated to throw more light on the subject.

Reference

1. El-Mofty AM, Soliman L, Nada MM et al: Porphyrin metabolism in lupus erythematosus, *Indian J Dermatol Venereol*, 33:109, 1967.
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3. Rimginton C: Association of Clinical Pathologists, Broadsheet No. 70 (Revised Broadsheet 36), August, 1971.