A SPECTROPHOTOMETRIC STUDY OF ERYTHROCYTE PORPHYRINS IN PATIENTS OF ATOPIC DERMATITIS

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Summary

A quantitative assay of porphyrins in blood of thirty patients with atopic dermatitis was done. Rimington's technique for the estimation of porphyrins was employed. Porphyrin levels in thirty cases of atopic dermatitis were compared with levels in ten controls. No statistically significant difference in porphyrin levels was observed between the study and control groups. Porphyrin levels were also compared between patients with and without history of photosensitivity. The erythrocyte coproporphyrin level in patients with photosensitivity was significantly higher than in patients without photosensitivity.

Introduction

Porphyrins are cyclic compounds produced as by-product in the synthesis of haemoglobin and possessing remarkable photodynamic properties. The porphyrins are capable of selectively absorbing large amounts of solar energy in the 400 nm range and this absorbed energy is then transferred to adjacent areas producing cellular damage. Increased porphyrin excretion has been found in many photosensitive dermatoses. Porphyrin excretion in urine and faeces was found to be increased in cases of pellagra[1]. Porphyrinuria was reported in pellagra by Kesten and Slatkin. Atopic dermatitis is known to occur on light exposed areas and there is history of photosensitivity in some cases of atopic dermatitis. This prompted us to look for any derangement in porphyrin metabolism in patients with atopic dermatitis. The present study was conducted to find out levels of porphyrins in blood of thirty patients with atopic dermatitis as compared with ten normal individuals constituting control group. To the best of our knowledge no known study has so far been done to investigate porphyrin levels in atopic dermatitis. Porphyrin levels have also been compared between patients in the study group with and without photosensitivity.

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Material and Methods

Rimington's method was employed for the estimation of porphyrins in blood.

Thirty patients with atopic dermatitis, twenty-seven males and three females, were selected for the study. Criteria employed for the diagnosis of atopic dermatitis cases was clinical and histopathological. A special note

was taken of the cases with histoy of photosensitivity. Cases with history of liver disease, alcohol intake or consumption of hepatotoxic drugs were excluded.

The results are tabulated below.

TABLE 1

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

Group	Number of cases	Range	Mean	S.D.	S.E.
Erythrocyte Coproporphyrin					
Study	30	0- 4.940	1.716	1.127	0.205
Control	10	0- 3.920	1.586	1.117	0.353
Erythrocyte Protoporphyrin					
Study	30	3.710-23.530	10.813	5.335	0.974
Control	10	5.250-20.590	11.028	4.765	1.506

TABLE 2

Showing erythrocyte porphyrins in patients with and without history of photosensitivity in μg/100 ml erythrocyte

Group	Number of cases	Range	Mean	S.D.	S.E.
Erythrocyte Coproporphyrin					
Without photo-sensitivity	10	0- 2.960	0.914	0.927	0.293
With photo-sensitivity	20	0.800- 4.940	2.118	1.010	0.225
Erythrocyte Protoporphyrin					
Without photo-sensitivity	10	5.230-21.960	13.071	5.013	1.585
With photo-sensitivity	20	3.710-23.530	9.684	5.245	1.170

Discussion

Porphyrin levels in thirty cases of atopic dermatitis were compared with ten controls.

The values of mean and S.D. of erythrocyte coproporphyrin in study group were 1.716 and 1.127 while in control group these were 1.586 and 1.117 respectively. On comparison the 't' value was 0.317 which is statistically insignificant. The values of mean and S.D. for erythrocyte protoporphyrin in study group were 10.813 and 5.335 while in control group these were 11.028 and 4.765 respectively. On comparison the 't' value was 0.113 which is statistically insignificant.

In addition, a comparison was done between patients with and without history of photosensitivity. Twenty patients showed photosensitivity and ten were without history of photosensitivity. On comparison the 't' value between the two groups for erythrocyte

coproporphyrin was 3.169 and for erythrocyte protoporphyrin it was 1.690. All the values were insignificant statistically except in erythrocyte coproporphyrin where the 't' value (t = 3.169) was statistically significant because the value was higher than the table value which is 2.04 for 28 degree of freedom at 95 per cent level of confidence.

Conclusion

Blood porphyrin levels in thirty cases of atopic dermatitis and ten normals showed no statistically significant difference. Cases of atopic dermatitis with photosensitivity showed raised erythrocyte coproporphyrin values as compared with patients without photosensitivity.

References

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