ESTIMATION OF PORPHYRINS IN CASES OF POLYMORPHIC LIGHT ERUPTIONS

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Summary

14 cases of Polymorphic light eruptions were investigated for any increase in porphyrin excretion. 10 out of these 14 patients showed increased excretion of porphyrins either in urine or faeces or both. 4 out of this showed uroporphyrinuria. 2 patients were observed to have uroporphyrinuria and coproporphyrinuria. In one patient uroporphyrin was found in detectable quantities in faeces as an isolated finding. In another patient in whom uroporphyrin was found in faeces, uroporphyrinuria and excessive quantities of protoporphyrin in faeces was found. In 2 more patients faecal coproporphyrin and protoporphyrin were found to be increased.

Introduction

Porphyrins are the by-products of haemoglobin biosynthesis. These substances have been found to be potent photosensitizers both in Vivo and in Vitro. There are many photosensitive dermatoses in which disturbance of either porphyrin metabolism or increased excretion of porphyrins have been noticed. The present study has been carried out in cases of polymorphic light eruptions to find out any increase in porphyrin excretion levels, considering even slight increase from normal levels as significant and abnormal.

Materials and Methods

15 normal subjects, 7 children—of ages ranging from 2½ years to 12 years and 8 adults of ages ranging from 21 years to 57 years were first investigated to determine the normal levels. 24 hours urinary excretion was determined by collecting it in a glass jar covered with a dark paper. Small quantities of early morning specimen of faeces was collected in a glass bottle likewise. Presence of porphobilinogen in the urine was qualitatively determined by Schwartz—Watson test. Urinary uroporphyrin and coproporphyrin and faecal uroporphyrin, coproporphyrin and protoporphyrin were determined according to Rimington's method. Urinary porphyrins were expressed as micrograms excreted per day (24 hours). Faecal prophyrins were expressed as micrograms per 1 gram of dried faeces.

14 patients with polymorphic light eruptions, 8 of them being children of varying in ages between 2½ years and 14 years and 6 adults varying in ages between 27 years and 50 years were investigated. The selection of cases were done by taking into consideration, presence of lesions, (1) like erythema, papules, pustules and vesicles on exposed parts. (2) Exacerbation of lesions on exposure to sun rays. (3) Seasonal variation. All these patients were routinely investigated for Urinalysis,

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especially for microcopic hematuria, faeces examination, blood counts and liver function tests.

Qualitative test for porphobilinogen and urinary and faecal porphyrin estimations were done as outlined earlier.

Rapid biochemical fluorescence test[1] was carried out in all cases to detect evidence of erythropoietic protoporphyria or erythropoietic coproporphyria.

Observations

The normal values of porphyrins in urine and faeces determined for paediatric and adults age groups are given in Table 1 and Table 2. In the first group (Table 1) the normal range for urinary uroporphyrin and coproporphyrin were from 0 - 1.32 μgms and 12 to 23.8 μgms per day respectively. In the faeces uroporphyrin was absent. For coproporphyrin and protoporphyrin the ranges were 0 - 1.3 μgm and 0.382 - 2.1 μgms per G. of dried faeces respectively.

In the adults (Table 2) the ranges for urinary uroporphyrin and coproporphyrin were found to range from 0 - 7.8 μgms and 61.7 - 121 μgms per day respectively. In the faeces as in the paediatric age group uroporphyrin was absent. The ranges for coproporphyrin and protoporphyrin being 0 - 3.4 μgm and 1.32 - 7.9 gms per G. of dried faeces.

TABLE 1

Urinary and faecal porphyrin levels in normal children

S. No.	Age	Sex	Urine Porphyrin as μgms per day		Faeces Porphyrins as μgms/G of dry weight		
			Uropor-phyrin	Copropor-phyrin	Uropor-phyrin	Copropor-phyrin	Protopor-phyrin
1.	2½	M	0	12	0	1.2	1 8
2.	3	F	0	13.5	Not done	Not done	Not done
3.	3	M	0.5	14.8	0	0	2.1
4.	8	F	1.3	23.8	0	1.3	1.3
5.	8	M	0 8	12.1	0	0.241	0.382
6.	11	M	0	18.1	0	0.64	2.1
7.	12	M	0	23.41	0	0.81	1.9
Normal Range			0–1.3	12–23.8	0	0–1 3	0.382–2.1

TABLE 2

Urinary and faecal porphyrin levels in normal adults

S. No.	Age	Sex	Urine Porphyrins as μgms per day		Faeces Porphyrin as μgm/G of dry weight		
			Uropor-phyrin	Copro-porphyrin	Uropor-phyrin	Copropor-phyrin	Proto-porphyrin
1.	21	M	4.576	83.7	0	3.3	7.4
2.	23	M	0	71	0	0	7.3
3.	26	M	1.8	87	0	1.6	4.1
4.	28	M	1.4	109.8	0	3.1	3.3
5.	30	M	4	76	0	0.78	1.32
6.	32	M	5.5	121	0	2 344	5.439
7.	50	M	7.8	81.3	0	3 4	7.9
8.	57	F	0	61.7	Not done	Not done	Not done
Normal Range			0–7.8	61.7–121	0	0–3 4	1.32–7.9

Comparing these values with those of patients with polymorphic light eruptions (Table III) it was found that urinary uroporphyrin levels were high in 7 patients. In two of these patients urinary coproporphyrin levels were also found to be high.

In faeces uroporphyrin was found in two patients. In one of these (P3), faecal protoporphyrin levels were found to be high. This patient also showed increased urinary uroporphyrin levels. Presence of abnormal urophyrins was noticed as a single isolated finding in only one patient. In two more patients faecal excretion of coproporphyrin and protoporphyrin were high. These patients did not show any increase in urinary porphyrins.

Out of 14 cases investigated in the present study, 10 showed increased porphyrin excretion in urine or faeces or both. Out of these 10 patients, porphyrinuria was present in 6 cases, 4 out of these patients showed uroporphyrinuria only, while the other two had raised uroporphyrin and coproporphyrin levels. In one patient there was increased excretion of porphyrins in both urine and faeces. In 3 patients there was either increased or abnormal porphyrins in faeces without any change in urinary porphyrins.

Discussion

In this study increased urinary excretion of porphyrins, uroporphyrin, or coprophyrin either singly or in combination was found in 7 out of 14 cases. Similar observation i.e., presence of porphyrinuria in cases of polymorphic light eruptions has been made earlier by Templeton and Lunsford[3], Kimming[3] and Hubner[4].

Uroporphyrin was noticed in faeces in the present study in two patients and this observation has been earlier documented[5].

TABLE 3

Polymorphic Light Eruptions

No.	Age	Sex	Nature of the skin lesion	Urine μgms/Day		Faeces μgms/G./D.W.		
				Uroporphyrin	Coproporphyrin	Uroporphyrin	Coproporphyrin	Photoporphyrin
1.	2½	M	Vesicles	7.2	70	0	0.2	1.752
2.	4	F	Vesicles	0	1.32	0	0.6	0.99
3.	5	M	Papules	4.16	20.5	0.63	0	2.49
4.	6	F	Erythematous Macules	1.8	14.6	0	0.33	0.2
5.	12	M	Eczema	0	16	0	0	0.49
6.	14	F	Solar Erythema	3.2	14.43	0	0.168	0.12
7.	5	M	Solar Erythema with bullous lesions	0	10	0	5	4
8.	6	F	do.	0	5	0	2.3	3.1
9.	27	M	Erythema	8.7	68	0	3.4	7.5
10.	30	F	do.	0	62.52	0	2.2	6
11.	30	M	Urticaria	8.9	80	0	0.6	0
12.	40	M	Eczema	11	131	0	1.4	3.2
13.	50	F	Solar Erythema	2.8	70	0	3.2	5.8
14.	24	F	Eczema	6	92	0.72	1.34	0.766
Normal Range			Children	0–1.3	12–23.81	0	0–1.3	0.382–2.1
			Adults	0–7.8	61.7–121	0	0–3.4	1.32–7.9

Out of 4 cases in which faecal porphyrins were found to be high it was associated with porphyrinuria in only one case. In one case uroporphyrin was found as the only abnormality. In other two cases, the levels of faecal coproporphyrin and protoporphyrin were not high enough to label them as cases of erythropoietic coproporphyria or erythropoietic protoporphyria. This observation has been confirmed by rapid bio-chemical fluorescence test also.

Conclusion

14 cases of polymorphic light eruptions were investigated for any increase in porphyrin excretion. 10 of these patients showed increased porphyrin excretion either in urine or faeces or both.

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TRUE

In vitro the epidermis of the aged is more permeable than that of the young but in vivo it appears less permeable. This apparent contradiction is due to the decreased clearance rates of substances entering the aged dermis. The movement of the foreign substances through old collagen and ground substances is decreased. As a result substances enter senescent skin readily but are not quickly removed. The retention of foreign chemicals may lead to increased reactivity to primary irritants. The potential for allergic sensitisation, however, does not increase.

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