LATENT PORPHYRIA IN MEMBERS OF THE IMMEDIATE FAMILY OF A PATIENT WITH ACUTE INTERMITTENT PORPHYRIA

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IN every case of the hepatic type of porphyria it is important that tests be made of the patient's immediate blood relatives in regard to the urinary excretion of porphyrins and porphyrin precursors. By such screening tests, and only by them, can persons with latent porphyria be discovered. They then can be warned to avoid certain agents known to precipitate attacks of acute porphyria. The purpose of this paper is to report the results of a screening study of eleven members of the immediate family of a patient with acute intermittent porphyria previously reported,[1] in order to determine whether or not any of them have latent porphyria.

Method

While the patient (a 26-year-old woman) was in the Cleveland Clinic Hospital, from March 12 to April 16, 1960, because of acute intermittent porphyria, urine specimens were repeatedly analyzed. On April 13, 1960, urine specimens of the patient, her father, and her mother, were collected with no time control. On August 8, 1961, urine specimens of each of the 11 individuals were collected on a 12-hour basis, in laboratory containers. Standard methods[2-4] were used for determining delta-aminolevulinic acid, porphobilinogen, and total porphyrins. The values of the urinary excretants of the patient and the 11 members of the family are listed in *Table 1*. *Figure 1* shows the status of each member in regard to porphyria.

Comment

No medical examinations were made of members of the patient's family. Only the mother and the father of the patient were interviewed. The father stated he had repeated episodes of abdominal pain that were not severe (he sought no treatment); he never noted the color of the urine during any episode; and he had never been operated on. The mother was asymptomatic, as were all the other members of the family who were tested.

It is most unlikely that the father has latent porphyria. In a random sample of the father's urine, the delta-aminolevulinic acid and total porphyrin concentrations were minimally elevated; they were normal in the 12-hour urine specimen.

The mother has latent porphyria and is the probable carrier of the trait to this family. The urine specimens of the mother had significant elevations of all three urinary excretants. The third, fourth, and fifth brothers of the patient probably have latent porphyria; each had slightly elevated urinary excretion of delta-aminolevulinic acid. The fifth brother is the most likely to have latent porphyria, because in

Table 1.—*Urinary excretion of porphyrins and porphyrin precursors in a patient and her family.*

Subject	Date of test	Delta-aminolevulinic acid (μg./ml. (normal range, 2-6 μg./ml.)	Porphobilinogen (Schwartz-Watson test) (Normal, negative)	Total porphyrins (screening) (Normal: 300 μg./24 hr., or 100 μg./liter)
				μg./24 hr.
Patient (case 2[1])	3/21/60	69	3+	2035
	3/29/60	54	2+	939
	4/4/60	13	1+	291
				μg./liter
	4/13/60	66	3+	685
	8/8/61	22	3+	850
Mother	4/13/60	20	1+	375
	8/8/61	24.9	1+	616
Father	4/13/60	7.5	Negative	141
	8/8/61	5.2	Negative	Normal
Son (1)	8/8/61	5.6	Negative	Normal
Son (2)	8/8/61	3.3	Negative	Normal
Brother (1)	8/8/61	4.3	Negative	Normal
Brother (2)	8/8/61	5.7	Negative	Normal
Brother (3)	8/8/61	7.6	Negative	Normal
Brother (4)	8/8/61	8.1	Negative	108
Brother (5)	8/8/61	8.3	Negative	384
Sister (1)	8/8/61	2.8	Negative	150
Sister (2)	8/8/61	3.3	Negative	224

addition to an elevated concentration of the excretant mentioned above, he had a slightly elevated uroporphyrin excretion (49 μg. per 24 hours; normal is less than 20 μg. per 24 hours). The urine specimens of the first and second brothers, the two sisters, and both sons of the patient had normal values for delta-aminolevulinic acid, and they are believed not to have latent porphyria. Although the total urinary porphyrin levels were slightly elevated in the two sisters, the values were believed not to be significant in view of the other normal values. Of all urine specimens

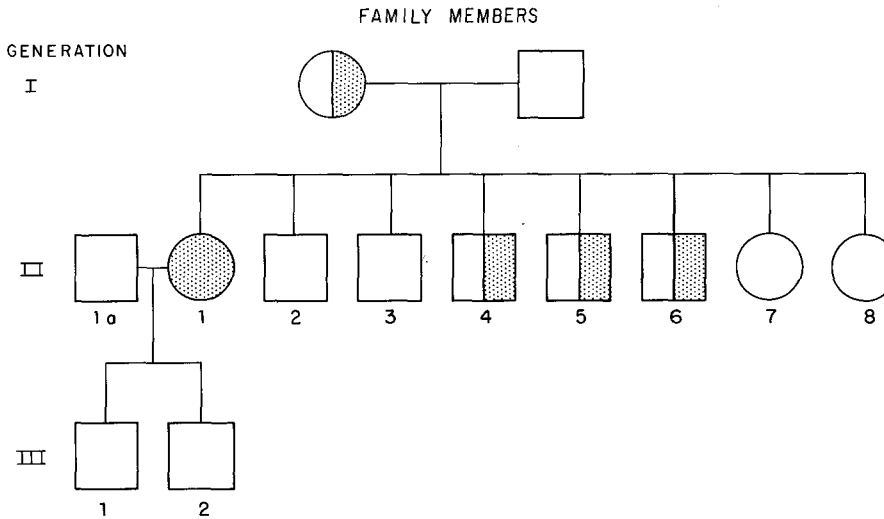

Fig. 1. Diagram showing relationship in a family of a patient with acute intermittent porphyria, and a comparison of the status of each member in regard to latent porphyria, based on delta-aminolevulinic acid determinations, and in three instances by uroporphyrin determinations as well. Full shading represents acute intermittent porphyria (the patient): half shading represents latent porphyria—increased amount of delta-aminolevulinic acid (the patient's mother and three brothers, who are asymptomatic).

tested, only those of the mother and of the patient contained abnormal amounts of porphobilinogen.

Summary

Eleven members of the immediate family of a woman with acute intermittent porphyria were tested for 12-hour urinary excretion of delta-aminolevulinic acid, porphobilinogen, and total porphyrins. The patient's mother and three brothers had elevations of delta-aminolevulinic acid excretion, and it is believed that this indicates latent porphyria. One of the three brothers also had slightly elevated uroporphyrin excretion. The mother had significant elevations of all of the above-mentioned excretants, and is believed to be the carrier of the trait to this family.

It is important in general to determine those who have latent porphyria, because this knowledge enables both the individuals and their physicians to take measures that may prevent the development of acute episodes of porphyria.

Acknowledgment

The author herewith acknowledges the initiative and help of Capt. Robert F. Peterson, MC, USAH 4005, formerly Fellow in the Department of Pathology, cur-

rently serving at Fort Hood, Texas, who suggested a study of the urine samples of the family, and who made the analyses.

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