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Recurrent Nephrolithiasis in Renal Tubular Acidosis. Metabolic Profiles, Therapy and Course

W. Schneeberger [1], A. Hesse [2], and W. Vahlensieck [2]

[1] Rehabilitations-Krankenhaus, W-5303 Bornheim-Merten, [2] Experimentelle Urologie in der Urologischen Universitäts-Klinik, W-5300 Bonn, FRG

Abstract. 13 patients with recurrent urolithiasis and distal renal tubular acidosis (RTA I) were investigated for lithogenic metabolic disorders. Treatment was given and the patients observed for periods of up to 10 years.

Key words: Urolithiasis, Renal Tubular Acidosis

In the case of patients with recurrent urolithiasis, RTA can be diagnosed by checking their urine acidification and blood gas analysis. This will also permit a distinction to be made between complete and incomplete forms. RTA is particularly suspect as the causal metabolic disorder in cases of exclusively alkaline urine reaction where no infection is present, and in cases of nephrocalcinosis. In the literature, the frequency of RTA in urolithiasis is given as approximately 10%, which corresponds to the frequency of primary hyperparathyroidism in nephrocalcinosis. Of the 1,029 patients we have examined since 1976, 20 had RTA. We were able to observe and re-examine 13 of these over an extended period of time. A course of treatment, dependent on their individual metabolic profiles, was initiated for each patient. This was subsequently modified as required, and the efficiency of the various measures taken duly recorded.

Material and Methods

During a 10-day basic check-up as in-patients on a standard diet, RTA diagnosis was made using the ammonium chloride loading test and blood gas analysis. We found 9 patients with incomplete, and 4 with complete RTA. Apart from RTA diagnosis, calcium, phosphate, and oxalate levels were investigated, and oral calcium loading tests and stone analyses conducted. We then began the treatment and observed patients for up to 10 years. Where required, the therapy was either modified or changed.

Table 1: Metabolic disorders in our patients (n = 13) with

	Complete RTA (n = 4)	Incomplete RTA (n = 9)
Hypercalciuria	2	9
Hyperphosphaturia	0	1
Hyperoxaluria	0	0
Hyperuricosurica	0	2
Hypocitraturia	3	5
Hypokalemia	3	6
Ca-Phosphate Stones	1	5
Ca-Phosphate/Ca-Oxalate Stones	2	3
Ca-Oxalate Stones	0	1
Ca-Phosphate/Ca-Oxalate/ Cystine Stones	1	0
Nephrocalcinosis	3	7
Renal insufficiency	1	0

Results

The distribution of metabolic disorders is shown in Table 1. In addition to calcium oxalate and calcium phosphate stones, one female patient also had low cystinuria and cystine stones.

In order to normalize the acid-base metabolism, patients with complete RTA were treated with sodium bicarbonate or citrate complexes (Uralyt-U) or ethacrynic acid (Hydromedin). Patients with incomplete RTA received urine-acidifying drugs, mainly ammonium chloride or methionine. In cases of severe hypercalciuria, fibre (Farnolith = mixed brans) or thiazides were administered.

Patients with hyperuricaemia or hyperuricosuria received Allopurinol. Hypopotassaemia was substituted and urinary infection was treated.

Table 2: (Therapy)

In 2 out of 4 cases with complete RTA the urinary stone disease was not progressive in terms of X-ray status or stone episodes. 1 patient passed further stones, but no new ones were formed. In 1 patient, stone formation and renal insufficiency were progressive.

Table 3: (Stone Episodes)

Conclusions

The treatment of RTA in terms of its main aspect - nephrocalcinosis - is differential and is only successful to a limited degree. The therapeutic approach has to be based on precise metabolic investigations, and must be monitored by follow-up examinations. In the case of our patients, we were able to achieve an improvement in 9 out of 13 cases.

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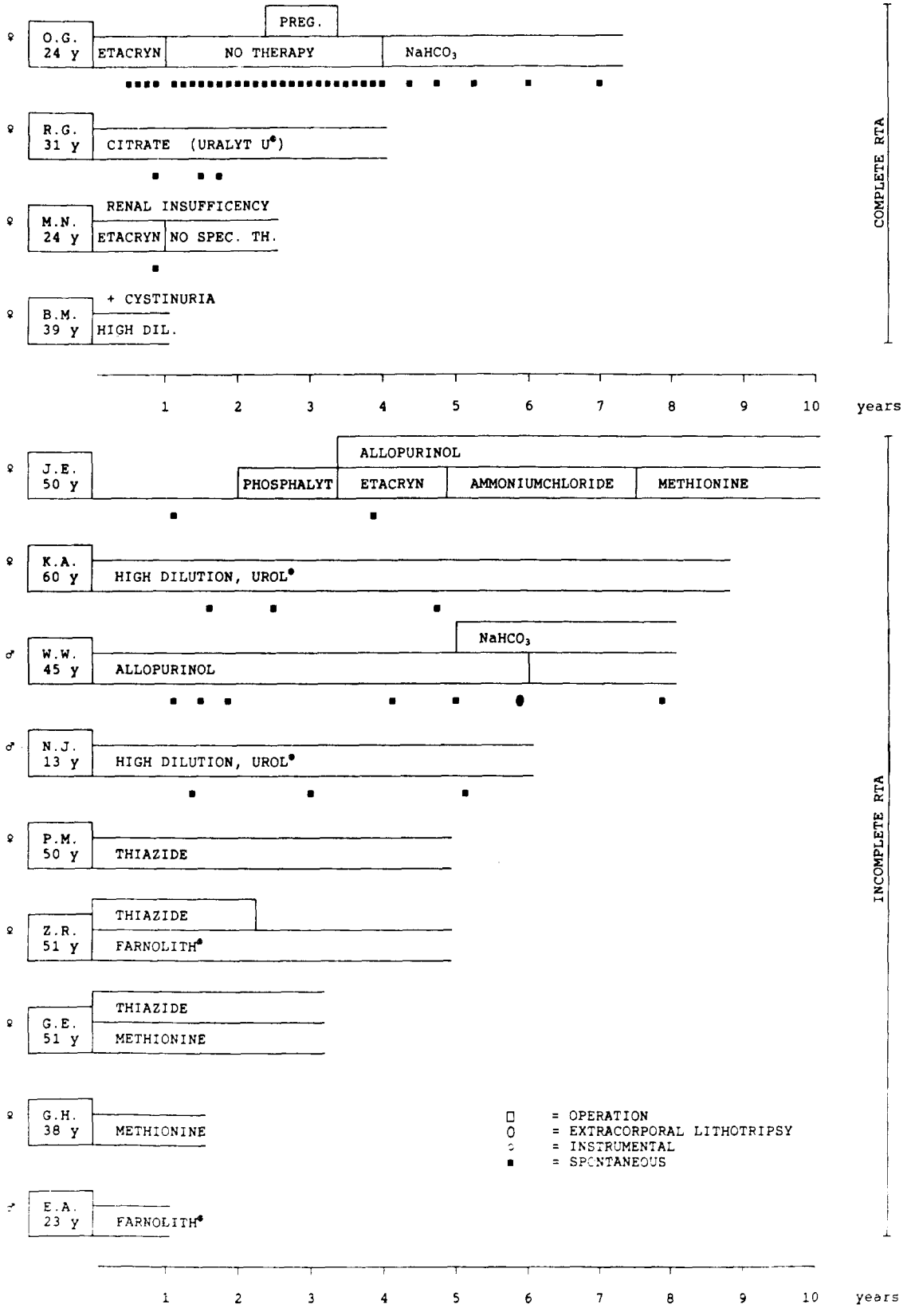
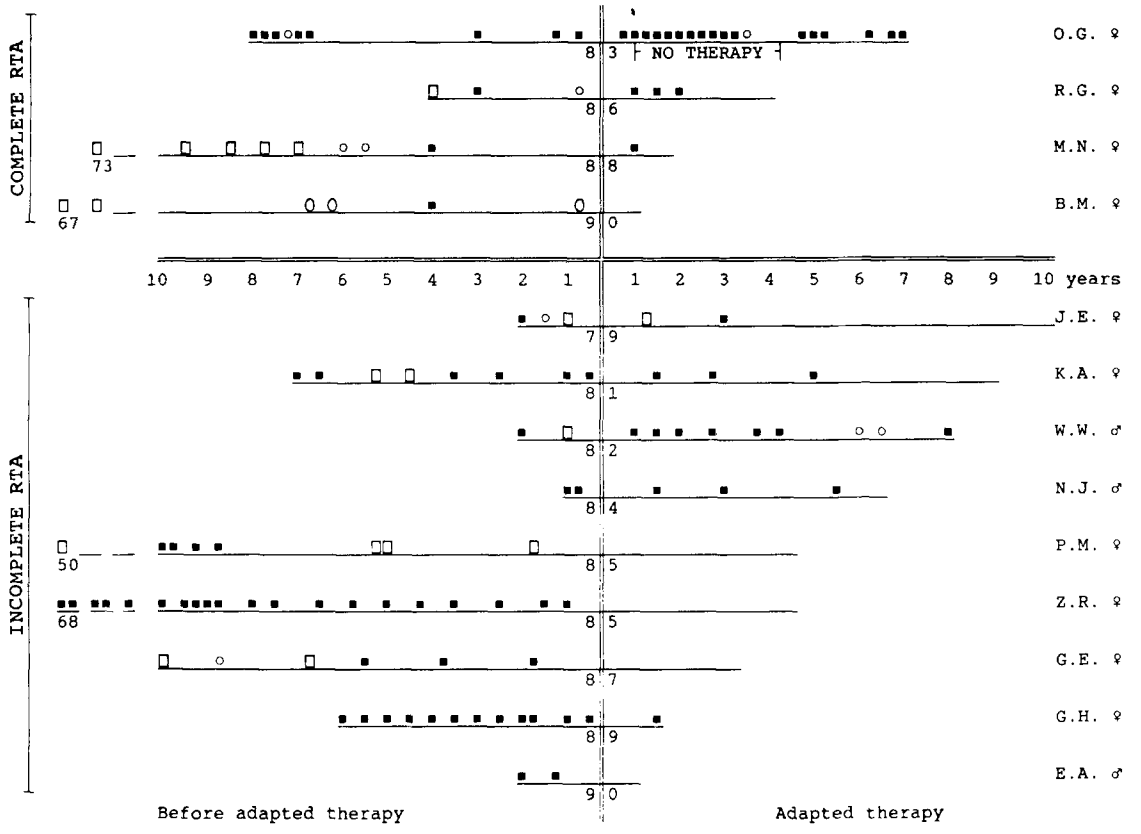
THERAPY


PREG.
♀ O.G. 24 y
ETACRYN
NO THERAPY
NaHCO3
♀ R.G. 31 y
CITRATE (URALYT U®)
RENAL INSUFFICENCY
♀ M.N. 24 y
ETACRYN
NO SPEC. TH.
+ CYSTINURIA
♀ B.M. 39 y
HIGH DIL.
COMPLETE RTA
1 2 3 4 5 6 7 8 9 10 years
ALLOPURINOL
♀ J.E. 50 y
PHOSPHALYT
ETACRYN
AMMONIUMCHLORIDE
METHIONINE
♀ K.A. 60 y
HIGH DILUTION, UROL®
NaHCO3
♂ W.W. 45 y
ALLOPURINOL
♂ N.J. 13 y
HIGH DILUTION, UROL®
♀ P.M. 50 y
THIAZIDE
THIAZIDE
♀ Z.R. 51 y
FARNOLITH®
THIAZIDE
♀ G.E. 51 y
METHIONINE
♀ G.H. 38 y
METHIONINE
♂ E.A. 23 y
FARNOLITH®
□ = OPERATION
○ = EXTRACORPORAL LITHOTRIPSY
○ = INSTRUMENTAL
■ = SPONTANEOUS
INCOMPLETE RTA
1 2 3 4 5 6 7 8 9 10 years



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Dr. W. Schneeberger
Rehabilitations-Krankenhaus
Klosterstr. 2
W-5303 Bornheim-Merten, FRG