13 EXPERIMENTAL REFLUX NEPHROPATHY: ITS RAPID INDUCTION AND RESPONSE TO TREATMENT.

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Previous work has indicated the importance of vesicoureteric reflux (VUR) with intravascular reflux (IPR) in the presence of urinary infection for the development of myelomeningitic scarring. The distribution of such scars is determined by individual papillary morphology which relates to their vulnerability to IPR. This study examines the initiation of the scarring process and the influence of early antimicrobial treatment. Urinary infection was introduced in 45 piglets with unilateral VUR and IPR. Control animals (no antimicrobial treatment: n = 27) were examined after 1, 2, 3 and 4 weeks of infection. In 2 groups urinary infection was eliminated after 1 week using in one (n = 8) a combination of gentamicin and chloramphenicol and in the other (n = 5) nitrofurantoin and these were examined at 4 weeks. Parenchymal damage was present in half the control animals after 1 week and established scarring in all but 1 between 2 and 4 weeks. Of the treated animals some scarring was present in approximately half, but it was much less extensive and different in character. In the presence of infected reflux, segmental scarring occurs with dramatic speed but the process may be modified by very early treatment with antimicrobial drugs.

14 UNSTABLE BLADDER ACTIVITY AND MICTURITION SYMPTOMS IN GIRLS WITH PRIMARY VESICO-URETERIC REFLUX (VUR).

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A series of 37 girls with primary VUR underwent urodynamic investigation. Twenty-eight (75%) had idiopathic unstable bladder activity. Disordered bladder control, especially the "urge syndrome" was common and persisted after urine infection had been eradicated. The following symptoms when occurring regularly at a frequency of once per week or more were significantly associated with instability:

Urgency	26 cases	p = < 0.01
Urge Incontinence	19 cases	p = < 0.01
Nocturnal enuresis	13 cases	p = < 0.05

These symptoms occurred significantly more often in VUR patients than age matched controls, whom we are now studying urodynamically. Unstable bladder activity frequently generates high intravesical pressures and may have implications for the reflux phenomenon.

* De Jonge, G.A.. In Bladder Control and Enuresis (ed. Kolvin, I., MacKeith, R.C. & Meadow, S.R.); Heinemann, London, 1973, pp 66 - 69.

15 VESICAL SPHINCTER DYSSYNERGIA ASSOCIATED WITH REFLUX

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Vesical sphincter dyssynergia in the pediatric patient is getting greater recognition. Its etiology in daytime and nighttime wetting and urinary tract infection has been established. However, severe voiding dysfunction may contribute to significant bladder abnormalities and vesicoureteral reflux. Within the last three years, ten patients with vesical sphincter dyssynergia and reflux have been identified and treated. Eight patients had a reversal of a previous failure of antireflux surgery, by correcting the voiding habits. Two children had a lessening of the degree of reflux prior to antireflux surgery. Elimination of sphincter dyssynergia may help to contribute to normalization of the competence of the intramural ureter.

16 CONTROL STUDY OF MEDICAL (M) VERSUS SURGICAL (S) TREATMENT OF VESICoureTERAL REFLUX (VUR).

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The purpose of this prospective study is to determine whether renal scars may be prevented in children with VUR by either a strict M treatment program or by S treatment (ureteral reimplantation) combined with a M program. Patients (pts) age 2 months to 12 years were admitted to the study after voiding cystourethrogram (VCUG) showed VUR grade 2a or greater regardless of the presence or absence of renal scars on excretory urogram (EU). After classification according to age and grade of VUR pts were assigned by randomization to the M or S regimen. All pts were treated prophylactically with Septra (Str) (1mg TMP, 5mg SMX/lb) or Macrodon (Mcd) (1mg/lb) nightly. Pts with 2a VUR were assigned only to the M program and did not undergo cystoscopy. Urine cultures were done monthly for 6 months then every 2 months, nitrite tests at 2-4 week intervals at home on overnight specimens, CBC, BUN, creatinine, SGOT at the beginning of study and at regular intervals. 33 pts have now been followed for a total of 277 months. Only 3 pts had a positive urine culture, 2 on Str and 1 on Mcd prophylaxis. Follow-up VCUGs of pts on M treatment have shown no change in 4, + grade of VUR in 2 and no VUR in 3. Follow-up EU show no change in 4, (2 on S protocol), + calyceal abnormalities with + growth in 1. Blood tests remain normal.

Although S cures VUR, children on a strict M protocol maintain a sterile urine, show + VUR, + renal abnormalities and + growth of affected kidneys. Supported by Burroughs Wellcome Co. grant.

17 Although the relationship between urinary tract infection (UTI), vesicourethral reflux (VUR) and renal scars is well established, it is still debated whether

VUR in the absence of UTI can cause renal damage. To examine this question, the growth of the renal parenchyma was followed in patients with VUR and A) UTI during follow-up period (n=8), B) previous histories of UTI but no UTI during the follow-up period (n=9) and C) no history of UTI (n=7). The area of the renal parenchyma has been determined planimetrically from 2 urographies recorded with 3.0-8.5 years interval. In group C the size of the kidney did not differ significantly from that in control children. In group A and B the relative size of the kidney (as compared to the size of the kidney expected for age) was smaller than normal in the beginning of the study. In group A the relative size of the kidney decreased significantly during the follow-up period, while in group B the relative size of the kidney was constant during the follow-up period. The decrease in relative kidney size in group A was due both to formation of new scars, progression of preformed scars and general growth retardation. - It is concluded that structural damage of kidneys associated with a refluxing ureter is mainly induced by urinary tract infection.

18 VALUE OF LEVILL DIAGNOSIS AND AGE AT THE ONSET OF CHILDHOOD URINARY INFECTION IN PREDICTING RENAL INJURY

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252 infants and children were followed-up for 2 years after their first UTI. I.v. pyelography was taken in the beginning and at the 2-year check-up. M.C.U. was performed after the third UTI at the latest. The level of each symptomatic UTI was determined by the following criteria: rectal temperature, ESR, CRP and renal conc. cap. 12 patients (5%) developed a renal scar during the study. 10 of them had their first upper UTI under the age of 12 months, and in this group the incidence of renal scarring was 10% (10/96). Among the patients who had their first upper UTI above the age of 12 months, the incidence of renal scars was 3% (2/69), but no scars were observed among the 87 patients with their first lower UTI or ABU. The age at the onset of the disease and the level diagnosis of symptomatic UTI may help in predicting the risk of renal injury. Therefore these facts should be considered when the need of urological investigations is evaluated.