Effect of Standardized Mixture of Potassium and Sodium Citrate and Citric Acid (Uralyt-U) on the Correction of Postoperative Acidosis in Patients Who Underwent Ureterosigmoidostomy

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pressure, bicarbonate and base excess. Sodium and potassium were determined by flame photometry. Chloride was measured by amperometric titration. BUN was determined by a diacetylmonoxime-thiosemicarbazide reaction and creatinine was estimated with a modified Jaffe technique. Arterial blood gas measurements were performed using an automated microblood-gas analyzer (Coulter Counter T660, Coulter Electronics Inc., USA) and arterial bicarbonate concentration was calculated using the Henderson-Hasselbach equation.

Treatment with Uralyt-U or sodium bicarbonate induced a significant reduction in se-

Dear Sir,

Ureterosigmoidostomy is a well-established means of continent urinary diversion, which is useful in patients with fecal continence, normal innervation of the anal sphincter and good renal function [1]. There usually is some tendency to cause postoperative acidosis, which needs to be prevented or corrected with supplementary oral bicarbonate [2]. Uralyt-U (Dr. Madaus Inc., FRG) is a new urinary alkalinizing agent composed of 2 mmol potassium and 2 mmol sodium citrate and 1 mmol citric acid. In the present study, we investigate the influence of this drug on the correction of postoperative acidosis in patients who underwent ureterosigmoidostomy, and compare the repair of acidosis in the patients receiving sodium bicarbonate.

Twenty-nine patients who underwent ureterosigmoidostomy following cystectomy for carcinoma of the bladder were studied. There were 14 males and 15 females. They were divided into two groups: group I-10 patients, aged 55-81 years (mean 65), were treated with 6.0 g Uralyt-U orally/day for 4 weeks; group II-19 patients, aged 48-81 years (mean 62), received 6.0 g sodium bicarbonate orally/day for 4 weeks. No patient was on alkali therapy at the time of the study.

In all patients, blood was drawn before and 4 weeks after the study for analysis of sodium, potassium, chloride, blood urea nitrogen (BUN), creatinine, pH, carbon dioxide

Table 1. Serum chemistry studies in diverted patients treated with Uralyt-U or sodium bicarbonate
 rum chloride concentration. However, no considerable difference was observed between the two groups (table 1). Serum levels of sodium, potassium and creatinine and BUN levels were similar in the two groups. No significant differences were seen in these measurements comparing pretreatment values with posttreatment ones (table 1). Both alkali therapies resulted in a considerable increase in blood pH, bicarbonate and base excess. However, there was no significant difference between the two groups (table 2). No significant change in carbon dioxide pressure was observed after treatment with Uralyt-U or sodium bicarbonate,

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after

after

Table 2. Arterial blood gas determinations in diverted patients treated with Uralyt-U or sodium bicarbonate

Variables

Group I (n = 10)

before

Group II (n = 19)

before

pH	7.369±0.029	7.402±0.032*	7.372±0.031	
Carbon dioxide pressure, mm Hg	36.1±6.2	39.8±5.2	37.2±3.8	
Calculated bicarbonate, mEq/l	20.6±3.2	24.1±2.7*	20.9±2.0	Base excess, mEq/l -2.5±2.1
	0.2±1.2**	-2.4±2.0		
	7.427±0.048***	37.9±4.3	23.1 ± 3.5**	0.3±1.2**

Each value represents mean ± SD.

*p < 0.05; **p < 0.01, ***p < 0.001: compared to before treatment.

and there was no considerable difference between these groups (table 2).

Since Ferris and Odel [3] first described an unusual electrolytic pattern characterized by hypokalemia, hyperchloremic acidosis, and absorption of ammonia in patients with ureterosigmoidostomy, it has been estimated that anywhere from 50 to 100% of all patients undergoing this procedure will show some degree of these abnormalities [4, 5].

The severity of this disorder is directly related to the area of colonic mucosa exposed to urine as well as the time the urine-feces

mixture is in contact with the colonic mucosa [6]. According to McConnell et al. [7], the mechanism of this abnormality is also related to secretion of bicarbonate by the colonic mucosa with concomitant absorption of chloride. Most patients receiving ureterosigmoidostomy lose from 100 to 150 mmol bicarbonate/day in the urine-feces mixture [7]. To avoid the systemic complications associated with a chronic metabolic acidosis, these patients are usually placed on a low chloride with alkali supplementation in the form of bicarbonate [8]. If too sudden repair of the

acidosis occurs with sodium bicarbonate, however, there may be a remarkable fall in plasma potassium as acidosis changes toward alkalosis [8]. In this study, we used a standardized mixture of potassium and sodium citrate and citric acid. The effect of this mixture on the correction of postoperative acidosis in patients who underwent ureterosigmoidostomy was similar to that of sodium bicarbonate. According to our results, it is better to use this mixture as well as sodium bicarbonate in order to avoid an elevated level of serum potassium.

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