

15351

Failure of Methionine to Reduce Nitrogen Loss in Postoperative Herniorrhaphy Patients on Restricted Diet.*

CECILIA RIEGEL, C. E. KOOP, AND R. P. GRIGGER. (Introduced by I. S. Ravdin).

From the Harrison Department of Surgical Research, and the Surgical Service, Hospital of the University of Pennsylvania, Philadelphia.

Evidence that the addition of methionine to a standard diet decreased the urinary nitrogen output of dogs was reported by Miller.¹ It seemed of interest to see whether a similar effect could be obtained in patients, particularly surgical patients during the period of reduced food intake which often follows after operation.

For reasons of availability and relative uniformity 14 male patients were selected who were undergoing unilateral herniorrhaphy. They were divided into 3 groups as follows:

1. Four controls were studied for 10 days beginning on the first postoperative day. They received no added methionine.

2. Five patients were studied for 10 days beginning on the first postoperative day. They received 6.0 g of methionine daily for the first 5 days of the study.

3. Another 5 patients were studied for 10 days beginning on the first postoperative day. They received 6.0 g of methionine daily for the second 5 days of the study.

All patients were fed daily a diet containing approximately 1,000 calories and consisting of 40.0 g of protein, 40.0 g of fat, and 130.0 g of carbohydrate. The patients were kept in bed throughout the study.

Urine was collected in 24-hour periods and the volume measured. Aliquots of the first 5 days were pooled, and aliquots of the second 5 days were pooled. Analyses were run on a portion of each pooled specimen for total nitrogen by a semi-micro Kjeldahl

method. Total urinary nitrogen excretion was calculated from this. Fecal nitrogen output was not determined in this group of patients but averaged 1.0 g in 18 other patients studied.² In this study we used an average figure of 1.0 g daily.

Results. Table I shows average intake and average excretion of nitrogen in the individual patients in the 3 groups for the 2 5-day periods.

Plasma protein concentrations were not significantly altered during the 10-day period.

Discussion. As no significant difference was found in the controls between the mean difference in intake and output of nitrogen for the first 5 days and the mean difference in intake and output of nitrogen for the second 5 days when no methionine was given, any significant differences found in those patients receiving methionine could properly be attributed to the effect of methionine. However, although small differences were found in the average output between the "methionine-fed" period and the "no methionine" period, when analyzed statistically the differences were found not to be significant (Table I). The amount of methionine fed these patients (approximately 0.1 g per kilo of body weight) was in the same range as the dogs studied by Miller.¹ The patients were on a low total caloric diet and a low, but not starvation, intake of nitrogen. It was found by Miller, whose dogs presumably received sufficient calories for maintenance, that the effect of methionine was greater in his animals before their protein stores had become depleted. These patients prior to operation were on a normal diet, and it must

* The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the University of Pennsylvania.

¹ Miller, L. L., *J. Biol. Chem.*, 1944, **152**, 603.

² Riegel, Cecilia, Koop, C. E., Drew, J., Stevens, L. W., and Rhoads, J. E., to be published.

TABLE I.
Effect of Administration of Methionine on Urinary Nitrogen Excretion.

	First 5 days			Second 5 days		
	Intake g	Urine, N. g	Diff. g	Intake g	Urine, N. g	Diff. g
No methionine						
1	32.8	62.2	-29.4	33.6	50.9	-17.3
2	35.3	61.8	-26.5	32.0	47.1	-15.1
3	35.3	49.3	-14.0	32.4	44.7	-12.3
4	33.5	57.6	-24.1	33.1	57.1	-24.0
	Mean diff.		-23.5	Mean diff.		-17.1
Methionine first 5 days—6.0 g daily						
5	35.9	36.3	-0.4	32.8	31.1	+1.7
6	35.0	69.1	-34.1	32.8	72.2	-39.4
7	35.1	68.1	-33.0	32.1	54.7	-22.6
8	32.2	63.0	-30.8	33.9	79.2	-45.3
9	35.7	71.6	-35.9	31.2	60.7	-29.5
	Mean diff.		-26.8	Mean diff.		-27.7
Methionine second 5 days—6.0 g daily						
10	32.4	63.4	-31.0	36.0	51.7	-15.7
11	33.0	38.8	-5.8	35.5	44.1	-8.6
12	31.9	57.9	-26.0	35.4	62.7	-27.3
13	32.9	46.1	-13.2	33.9	44.1	-10.2
14	30.1	39.5	-9.4	32.9	46.6	-13.7
	Mean diff.		-17.1	Mean diff.		-15.1
<i>Controls</i> —First 5 days — mean difference 23.5 g						
Second 5 " — " " " 17.1 g						
Diff. between means = 6.4 g						
S.E. diff. = 4.1						
<i>Methionine Exper.</i> —Period with methionine M.D. 21.0 g						
" without " M.D. 22.4 g						
Diff. between means = 1.4 g						
S.E. diff. = 5.9						

be presumed that their protein stores were not depleted.

Conclusion. Under the conditions of this experiment the administration of 6.0 g of

methionine daily to men receiving a low caloric diet failed to show a significant protein-sparing action as indicated by the effect on urinary nitrogen excretion.

15352 P

Effectiveness of Streptomycin in Arthritis of Rats.

H. M. POWELL, W. A. JAMIESON, AND R. M. RICE.

From the Lilly Research Laboratories, Indianapolis, Ind.

Two years ago we reported that penicillin was ineffective in the chemotherapy of arthritic rats infected with pleuropneumonia-like organisms, while myochrysine was effective in this respect, but at the same time

quite toxic and hazardous to use in these animals.¹ Electron morphology of the micro-organisms we used was dealt with at about

¹ Powell, H. M., and Rice, R. M., *J. Lab. and Clin. Med.*, 1944, **29**, 372.