L-Aspartate and Microproteinuria

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Dear Sir,

Bernard and Lauwerys [1] suggest that microproteinuria observed after infusion of L-aspartate is due to a tubular ‘washout’, as the L-aspartate infusion media contained NaCl in order to equalize the osmotic load. They found that a control group of volunteers infused with a equimolar dose of NaCl should have been included in the study.

Bernard and Lauwerys [1] finally show new data comparing urinary flow and excretion of β_2 -microglobulin after infusion of saline, L-aspartic acid and Z-arginine in rats. Urinary flow and β_2 -microglobulinuria were comparable after infusion of hypertonic saline or Z-aspartic acid plus sodium salt, and the authors therefore concluded that the decreased tubular reabsorption of β_2 -microglobulin was due to an unspecific osmotic effect causing an increase in urinary flow and a washout of proteins. This is likely to be the cause of the microproteinuria observed in the rat experiment, as the salts were given as a single injection. However, in experiments with healthy volunteers [2], it was attempted to obtain a steady state with high diuresis during the experiment in order to avoid a washout effect. This was done as described by Mogensen and Soiling [3] by giving tap water (250 ml) every 20 min, starting 2 h before the first urine collection period. Consequently, it is not possible on the basis of the rat experiment to conclude that the microproteinuria observed by Ødum et al. [2] was due to a ‘washout’ effect, as the experimental designs were different. The sodium excretion during the aspartate infusion experiment [2] has now been determined, revealing an insignificant rise

Fig. 1. Effect of sodium chloride infused in 2 volunteers on urinary excretion of major urinary proteinase inhibitor (MUPI) and β_2 -microglobulin (β_2 -M) and on diuresis (mean $\pm$ SEM). NaCl (154 mM) was infused at a rate of 2.3 mmol/min in the first 2 h shown. Total water intake was 300 ml every 20 min, starting 2 h before the first control urine collection.

($p > 0.20$) with a maximum (1.9 times baseline value) 2 h after infusion was started, e.g. 1 h before the maximal proteinuria (data not shown). Therefore, it is unlikely that sodium chloride was the cause of the proteinuria.

A control study, infusing physiological saline, as suggested by Bernard and Lauwerys [1], was in fact performed, but only as a pilot study in 2 persons. As seen in figure 1 there was no evidence that NaCl causes microproteinuria if the diuresis is constant. Therefore, we still believe that the microproteinuria observed after infusion of L-aspartate is not simply due to a washout effect.

Obviously, the mechanism is quite different from that of dibasic amino acids, e.g. the microproteinuria after L-aspartate is delayed and far less pronounced. Finally, we would like to stress that our results are not at variance with those published by Mogensen and Sølling [3] as the authors only investigated the β_2 -microglobulin excretion 20 min after aspartic acid injection.

References

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