cumulative excretion from day 4 to day 10 in the treated group was \((1.80 \pm 0.2) \times 10^5\) c.p.m. and in the control group was \((1.20 \pm 0.2) \times 10^5\) c.p.m. \((P < 0.001)\).

Discussion

This study demonstrates that there is a 50% increase in the rate of folate catabolism in mice with ascitic tumours. The increased rate of catabolism coincided with the accumulation of ascitic fluid in the treated animals and a substantial increase in both the number and the weight of the malignant cells, implying an active tumour. This suggests that the increased rate of catabolism was due either to an increased demand for folate coenzymes in the malignant cells or to increased folate turnover in the rapidly dividing cells. As there was a 5% increase in the weight of the tumour and a 5% increase in catabolism, it is likely that the increased catabolism was associated with increased cell turnover rather than an increase in weight of the tumour.

These results conflict with a recent study which reported that folate metabolism is decreased in tumour-bearing rats [10]. However, in the latter study the urinary metabolites were measured at 24 and 48 h after administration of radioactive PteGlu. It has been consistently shown that there is a complex pattern of excreted intact folates in the first 2 days after a radioactive dose and that the radioactive catabolic products are not found in the urine until after day 3 [4]. Furthermore, as in that study [10] the two main catabolites, PABGlu and APABGlu, were not estimated after day 3 it is unlikely that folate catabolism was being measured. Measurement of total excretion during this initial equilibration period completely masks any difference that exists in the excretion of folate catabolites [4]. In addition, the study made no attempt to distinguish between excretion of intact folate and of catabolites.

Why the presence of tumour cells, either in man [3] or in mice, should lead to increased folate breakdown remains unclear. It seems reasonable, however, that rapid cell division, dependent as it is on folate participation, might lead to increased turnover of the vitamins.

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References