

WISSENSCHAFTLICHE KURZMITTEILUNG

*From the Royal Australasian College of Surgeons, Melbourne (Australia)***Long term complete parenteral nutrition**

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This short account concerns a 45 year old male patient who was maintained in excellent clinical condition for a period of 7½ months on exclusively parenteral nutrition.

The patient's previous history was uneventful, except that he was known to have had a high alcohol consumption. He was admitted to hospital in January 1968 with an acute necrotising lesion of small bowel associated with superior mesenteric artery thrombosis. The affected section of small bowel was resected with end to end anastomosis. The necrotising lesion, however, was not controlled by this manoeuvre and two subsequent excisions of small bowel with end to end anastomosis were necessary so that finally the patient was left with only about 60 cms of small bowel, mostly terminal ileum. Even this residual bowel was denuded of mucosa and was practically functionless. For this reason, oral nutrition was impossible and intravenous therapy was planned to last for an indefinite period. In the original planning of this therapy it was aimed to provide a caloric intake of about 3,000 calories a day in the form of Fructose, Sorbitol, Xylitol and Ethanol and a synthetic amino acid intake which varied between 75 and 130 grams a day. As it was known that the patient would remain indefinitely on intravenous therapy, the opportunity was taken of doing complete balance studies on him every day and of assessing the efficacy of utilisation of various amino acid formulations both racemate and entirely L-isomer, and with different patterns of semi-essential and non-essential nitrogen. He was also used as a model for testing the efficiency of uptake at various concentrations and rates of infusion of Fructose, Sorbitol and Xylitol. The best incorporation of amino acids into body protein was achieved with entirely L-isomer amino acid solutions (Aminofusin®), together with a high caloric intake, and the best utilisation of carbohydrate was achieved with Xylitol, which was infused at concentrations up to 50%. Even at the highest infusion rate (62.5 grams per hour) of Xylitol, the urinary losses of this substrate did not exceed 4% of the input. During the course of the intravenous therapy, a deficiency syndrome of linoleic acid developed, associated with the appearance in body fluids of the abnormal fatty acid eicosatrienoic acid and the virtual disappearance of linoleic acid. This was a similar pattern to that frequently observed in experimentally depleted rats, but had not previously been observed in man. The essential fatty acid depletion was associated with a refractory anaemia and skin lesions, both of which responded to the infusion of 20% soya bean oil emulsion with associated restoration of a normal plasma fatty acid pattern. During the course of his therapy the patient also developed a zinc depletion which responded to the appropriate therapy.

Throughout this long period of exclusively parenteral nutrition, the patient remained in good clinical condition. During the course of therapy he showed a weight gain of 19 kilos and as the infusion solutions were administered through a subclavian catheter inserted by the supraclavicular route, he was ambulant. The patient could walk in the ward while his infusion therapy continues and he even made daily visits to the physiotherapy department where he exercised on a bicycle ergometer to maintain his skeletal muscles in good condition. His entire course of intravenous therapy involved the use of 1,278 bottles of intravenous fluid. At the end of this time his xylose excretion test had risen almost to normal, indicating considerable regeneration of the mucosa in his remaining segment of

small gut, and after $7\frac{1}{2}$ months of intravenous therapy it was possible to begin oral feeding. The patient has now been discharged from hospital and is being adequately maintained by oral feeding.

It is believed that this is probably the longest recorded case of exclusively parenteral nutrition yet reported and the case illustrates that, with modern intravenous therapy and meticulous attention to all of the known nutritional factors, it is possible to maintain a patient in excellent clinical condition for an indefinitely long period.

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