

0.66 Respective effects of nutritional status and phosphate depletion on rat muscle function

P.E. Bollaert, M. Gimenez, B. Robin-Lherbier, J.M. Escanyé, J.P. Mallié and A. Larcen
Service de Réanimation, Hôpital Central and Université de Nancy I, Nancy, France

In malnourished patients, refeeding can induce severe hypophosphatemia, sometimes associated with muscle weakness and rhabdomyolysis. In this setting, little is known about the respective role of both nutritional status and phosphate intake on muscle function.

Twelve male Wistar rats were fed hypocalorically with a low phosphate diet (0.05% P) for 6 weeks (initial P- group); 12 rats (initial P+ group) were similarly fed and drunk phosphate supplemented water. Six rats of each initial group received a hypercaloric glucose load (G+) during the seventh week (P-G+ and P-G+ final groups). The remaining underfed rats formed P-G- and P+G- final groups. The following parameters were measured: weight loss (WL), serum phosphate (PHO), swim time to exhaustion (ST). Minimal intracellular pH (pHi) and maximal creatine phosphate depletion index (PCr I) were also determined, using 31P NMR spectroscopy during maximal non tetanic stimulation of leg muscles.

Results:

Group	WL (%)	ST (min)	PHO (mg/l)	pHi	PCr I
P-G-	21±8	206±89	63±14	6.80±0.18	0.60±0.10
P+G-	20±6	117±34	57±6	6.69±0.05	0.63±0.06
P-G+	13±6	309±127	40±14	6.74±0.05	0.59±0.11
P+G+	11±11	211±132	55±8	6.70±0.14	0.67±0.06

(Mean ± SD)

By two-way ANOVA, G+ factor was associated with a significant decrease in PHO (p < 0.05). Both P- and G+ factors had a positive influence on ST (p < 0.02); ST and PHO were inversely correlated (p < 0.05). P- factor was associated with a higher pHi (p < 0.05).

Conclusion: This model suggests that phosphate depletion improve both underfed and refeed rat muscle function, especially when low PHO are achieved.

0.67 Nutrition behaviour and subjective well-being ("Quality-of-life") of tumor patients during oncological polychemotherapy

G. Ollenschläger, W. Thomas, K. Konkol, H.M. Steffen and V. Diehl
Dept. of Intern. Medic. II, I and Psychotherapy, Univ. of Cologne, Germany

Introduction: The purpose of this study was to evaluate the relationship between subjective well-being (the so-called "Quality-of-life") and nutrition behaviour during anorexic antitumor treatment of cancer patients.

Methods: In 16 pat. with acute leukemia, treated consecut. with standardized oncological polychemotherapy, the foll. param. were prospect. investigated during the whole treatment period (med. 22 weeks): energy intake p. day; weekly change of body weight, self-assessed subject. well-being (rated by visual analogue scales, using 16 items of subj. complaints). All pat. got intensive oral nutrition (meals of choice: offer of 1-2g prot., 30-50 kcal/kg BW per day plus daily motivation by a dietician). From the LASA-items, 3 factors f.1: "fatigue/malaise", f.2: "psychological distress", f.3: "therapy-side-effects" were calculated by the help of factor-analysis, and correlated to nutr. intake, body weight.

Results: All pat. lost BW within the first 3-7 weeks (median: 8% of org. BW; without correl. between prognosis/nutr. status. Until the end of induct. therapy, 68.8% of pat. regained normal nutr. status. Factor "side-effects" was inversely correlated (analys. of variance: p < 0.0001) to daily energy intake, corr. coeff. -0.3986; weight loss directly with fatigue/malaise, corr. coeff. 0.4305. There was no correl. betw. psychological distress/nutrition behaviour. In 3 pat., treated with 2 of the oncol. regimens, influences of therapy, of indiv. behaviour, of interactions between therapy and indiv. behaviour on the 3 factors were tested by analysis of variance. Thus,

subjective well-being was independent from type of tumor therapy and modified exclusively by influences of the individuum.

Conclusions: Subjective well-being of tumor patients during anorexic tumor therapy is highly correlated with nutritional behaviour and nutritional status. Impaired nutrient intake is a consequence of tumor therapy side-effects (anorexia, nausea, emesis) and is followed by loss of body weight, leading to the feeling of malaise. Antianorectic treatment and psychological care might be useful for improvement of nutrient intake and subjective well-being of pat., treated with aggressive antineoplastic therapy.

0.68 Whole body protein turnover (WBPT) and the acute phase protein response (APPR) in relation to the survival of colon cancer patients

K.C.H. Fearon*, D.C. McMillan†, T. Preston‡, D.T. Hansell†, A. Shenkin§ and O.J. Garden*
*Departments of Surgery, RI, *Edinburgh and †Glasgow, ‡SURRC, Glasgow, §Biochemistry, RI, Glasgow, UK*

The aim of this study was to determine if there is a relationship between duration of survival and the whole body protein kinetics or acute phase protein response of patients with colon cancer. Patients with a range of clinical stage of disease (n = 32; Dukes B:11, C:8, D:13) underwent measurements of WBPT (primed constant 24h infusion of ¹⁵N-glycine) and assessment of their APPR (C-reactive protein: CRP, albumin: Alb and CRP/Alb ratio) prior to resective surgery or diagnostic laparotomy. All patients were followed for a minimum of 5 years and survival noted. The results are shown in the Table:

	Correlation coefficient	Significance
Survival v WBPT	-0.379	p < 0.03
Survival v CRP	-0.556	p < 0.001
Survival v Alb	+0.577	p < 0.001
Survival v CRP/Alb	-0.556	p < 0.001

There was a statistically significant negative correlation between duration of survival and both WBPT (p < 0.03) and serum CRP (p < 0.001). A relationship was also found for albumin and CRP/Alb ratio. These results suggest that an enhanced rate of WBPT and APPR reflect the imbalance in the host-tumour relationship which is ultimately associated with the death of the patient.

0.69 Protein synthesis in human tumour and muscle is enhanced more by TPN than by solutions enriched with branched-chain amino acids

M.A. McNurlan*, S.D. Heys†, K.G.M. Park†, J. Broom‡, D. Brown*, O. Eremin† and P.J. Garlick*

**The Rowett Research Institute and the University of Aberdeen Medical School Dept. of †Surgery and ‡Clinical Biochemistry, Aberdeen, Scotland*

The ability of a BCAA-enriched solution to support protein synthesis in tumour and host tissue was compared with conventional TPN.

Twenty-four patients with colorectal tumours were studied as either fasted or fed, 0.2g nitrogen and 103 non-protein kJ (60% from Intralipid, Kabi-Vitrum and 40% from glucose)/kg body weight for 24h prior to surgery. The TPN solution contained a conventional amino acid mixture (Vamin, Kabi-Vitrum). The isonitrogenous BCAA solution had 30% of nitrogen from valine, isoleucine and leucine (4% BCA, Baxter). Protein synthesis was measured with the flooding dose technique from the incorporation of 57mg L-(¹⁵C) leucine (20 atoms %)/kg body weight for approximately 1h. To minimize perturbations arising from surgery, tumour biopsies were taken by sigmoidoscope and rectus abdominis muscle samples were taken immediately after induction of anaesthesia.

	Protein synthesis (k _a , %/d ± SEM)	
	Tumour	Muscle
Fasted (n = 9)	23±2	1.8±0.2
TPN (n = 9)	44±3*†	2.7±0.2*
BCAA (n = 6)	29±2†	1.9±0.2

Fed vs fasted: *p < 0.03, †p < 0.04; TPN vs BCAA: ‡p < 0.01