

FP1

NUTRITIONAL STATUS OF FOREIGN WORKERS AND LOCAL WORKERS IN MALAYSIA

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Nutritional status study on the legal foreign workers, illegal migrants and local workers was conducted between September 1998 - September 2000. In all, 715 individuals (363 illegal migrants, 207 legal foreign workers, 205 local workers) participated in this study. This study showed that Indonesian legal and illegal migrants constitute 88.9% and 52.5% of foreign work force respectively. The nutritional status showed that underweight was higher in illegal migrants than in legal foreign workers and local workers. The percentage of overweight and obesity was significantly higher in local workers than in legal foreign workers and illegal migrants. Clinical signs suggestive of vitamin A deficiency and riboflavin deficiency were seen more commonly in local workers than in migrants. Clinical signs suggestive of iron deficiency anaemia such as pallor and smooth tongue were seen more commonly in local workers. However, there was no significant difference in the mean of haemoglobin level between the three study groups.

Cancelled

FP3

Depression in malnourished children with cancer

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Background: Cancer is considered as the most feared of all the diseases. The stress of dealing with an illness like cancer can cause many uncomfortable feelings such as depression. Malnutrition and depression has close relationship with each other. Depression is closely associated with malnutrition.

Objective: To assess depression in malnourished cancer patients.

Method: The sample of 46 admitted paediatric cancer patients in pediatric oncology ward of Shaikat Khanum Memorial Cancer Hospital & Research Centre. 36 males and 10 females were assessed by a trained clinical psychologist & Clinical nutritionist by using psychological assessment form. Nutrition assessment of children were based on weight for age with the help of growth charts (Physical growth : National centre for health statistics percentiles. AM J CLIN NUTR 32 : 607 - 629, 1979).

Results: Of 46 malnourished pediatric cancer patients 36.95% (n= 17) were depressed. Malnourished patients were categorized into three categories on the basis of anthropometry mildly malnourished, moderately and severely malnourished. The incidence of depression in mildly malnourished patients was 4.34% (n=2), moderately and severely malnourished patients was 13% (n=6) and 17% (n=8) respectively.

Conclusion: This study shows that the depression is closely linked with the day by day deteriorating physical conditions likely malnutrition.

FP4

PROTEIN MALNUTRITION IS A NEGATIVE PROGNOSTIC FACTOR IN PAKISTANI CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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Aim

To assess the nutrition status of leukemic children at admission & its effect on the treatment outcome.

Method

163 patients with Acute Lymphoblastic Leukemia (ALL) below the age of 14 years with L1 & L2 FAB morphology were included in this study. All the sample were of newly diagnosed & untreated patients. Treatment protocol used was FBM. Serum Total Protein (STP) were also recorded before treatment & Malnutrition classification was done (Sue Rodwell 1985) as Well-nourished (G-0), Mildly Malnourished (G-1), Moderately Malnourished (G-2) & Severely Malnourished (G-3). Statistical analysis was performed by using one-way ANOVA.

Results

patients Well-Nourished (WN) were 47% & 53% were Under-Nourished (UN). Out of these 163 patients mildly malnourished were 22%, moderately malnourished 12% & severely malnourished were 19%. Overall Treatment outcome show that the patients who completed their treatment & alive alive, 5% relapsed & 45% expiries were observed in WN (Grade-0), 56% completed treatment & alive, 11% relapsed & 33% expiries were observed in Grade-I, 50% completed treatment & alive, 19% relapsed & 31% expiries were observed in Grade-II, 46% completed treatment & alive, 4% relapsed & 50% expiries were observed in Grade-III.

Conclusions

Our data were not significant (P=0.50) to prove the hypothesis that the Protein malnutrition negatively effects the treatment outcome in Pakistani children with Acute Lymphoblastic Leukemia (ALL).

FP5**Effect of Malnutrition on treatment outcome in Children with Acute Lymphoblastic Leukemia**

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Aim: To assess the nutrition status of leukemic children at admission & its effect on the treatment outcome.

Method: 163 patients with Acute Lymphoblastic Leukemia (ALL) below the age of 14 years with L1 & L2 FAB morphology were included in this study. The weight of the patients were evaluated through floor weighing scale, model # WX 5269, made by international weighing system, Germany. The height of the patients were determined according to the metric system on floor scale, model CP # 0158, made by the China export corporation, China. All the samples were of newly diagnosed & untreated patients. Treatment protocol used was FBM. Patients were classified according to waterlow classifications of malnutrition (1976) as Well-nourished (G-0), Mildly Malnourished (G-1), Moderately Malnourished (G-2) & Severely Malnourished (G-3). Statistical analysis was performed by using one-way ANOVA. Weight-for-Height, Weight-for-age were measured at 50th Percentile National Centre of Health Status (NCHS) growth charts & grading (Anthropometrical) was done with conventional methods by using National Centre of Health Status (NCHS) growth charts

Results:

Mean Age was 6.8+ years, Mean Height was 108.90+ cm & Mean weight was 19.63+ kg. Of 163 patients Well-Nourished (WN) were 37.43% (n=61) & 62.57% (n=102) were Under-Nourished (UN). Out of these 163 patients mildly malnourished were 22% (n=36), moderately malnourished 15% (n=23) & severely malnourished were 26% (n=43). Overall Treatment outcome show that the patients who completed their treatment & alive are 51% (n=83), Relapsed were 8% (n=13) & expired were 41% (n=67). 51% completed treatment & alive, 8% relapsed & 41% expiries were observed in WN (Grade-0). 47% completed treatment & alive, 14% relapsed & 39% expiries were observed in Grade-1. 57% completed treatment & alive, 0% relapsed & 43% expiries were observed in Grade-II. 40% completed treatment & alive, 11% relapsed & 49% expiries were observed in Grade-III.

Conclusion:

Our data were not significant (P=0.791) to prove the hypothesis that the malnutrition (Anthropometrical) adversely effects the treatment outcome in Pakistani children with Acute Lymphoblastic Leukemia (ALL).

FP6*Cancelled***FP7****The postprandial blood glucose level in Japanese diets and Western diets**

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Aim: It is important to prevent and treat with diabetic and arteriosclerosis to control an postprandial blood glucose. Glycemic index (GI) is examined as an index which shows rising extent of the postprandial blood glucose of each food. This research administered typical Japanese diets and the Western diets to the healthy persons and the diabetic patients and made comparative study of the change in postprandial blood glucose.

Methods: Healthy persons were nine dietitians (three men and six females) who worked in St. Marianna University School of Medicine, the average age was 35.8 years old, Diabetic patients were 6 patients (3 men and 3 females) in this hospital, and the average age was 57.2 years old. Japanese diets contained same energy and nutrients (carbohydrate 50g) as Western diets was made for the breakfast in two days, and measured the blood glucose before the meal and postprandial 15min, 30min, 45min, 60min, 90min, 120 min. with the blood glucose self-measuring instrument.

Results: The rise of postprandial blood glucose in the both of healthy and diabetic persons was duller in Japanese diets and GI indicated a low value than in Western diets. Especially, the value of 30 min. in the healthy persons and 60 min, and 90 min, in the diabetic patients in Japanese diets indicated significant low value. Afterwards, it decreased almost to same value for 90 minutes in a healthy person and 120 minutes in the diabetic patients.

Conclusions: The postprandial blood glucose in Japanese diets observes lower value than Western diets in the both of healthy and diabetes persons although the contains of energy and nutrients were same. Japanese diets were suggested to be effective the prevention and treatment of the diabetic.

FP8**The Glycemic Index for Processed Foods and Mixed Meals using Rice as the standard food.**

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Aim: Jenkins observed the area under post-alimentary blood glucose curve associated with blood glucose rise in the 1980s. By comparing various foods, he developed the glycemic index, GI. The reference food used was white bread. But it is not a staple food in Japan. It is necessary to study the GI of the common Japanese foods with white rice as the reference food.

Method: A total of 67 non IGT healthy subjects (24 males and 43 females) were included in the study. Standard and tested foods were taken after fast and the subjects measured their blood glucose using SMBG appliances. The blood glucose under curve area was calculated from the collected data. The GI values of the tested foods were determined with the standard food set at 100.

Results: A total 38 common Japanese food products both in single and mixed meals were examined for the GI values. GI values were lowered with mixed meals between rice and milk products as well as between rice and vinegar. The same results were seen when yogurt and soy bean products (natto, kinako, miso) were taken before rice intake.

Conclusions: With the above results, we concluded that using rice as the standard food, GI of various Japanese foods can be evaluated.

FP9

Correlates of Hypertension and Android Obesity Among Filipino Adults

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Aim: To examine the relationship of risk factors to hypertension and android obesity among Filipino adults.

Methods: Data on Body Mass Index using height and weight, and waist-hip ratio were collected in 4,541 subjects. Capillary blood samples were analyzed to determine fasting blood sugar, total cholesterol, LDL-cholesterol, HDL-cholesterol and triglycerides. Blood pressure measurement was used to determine hypertension prevalence. Data on relevant lifestyle habits, i.e. smoking, alcohol-drinking and physical activity were obtained using structured questionnaires. The data were analyzed using multiple logistic regression.

Results: Risks of developing hypertension were shown to start at age 40 and found greater among males and females as age advances and even becoming greater among males who had high triglyceride levels. The risks were also found greater among obese adults, women with large waist circumference (≥ 88 cm), and men with high WHR (≥ 1.0). The risks of developing android obesity were greater among males, 40 years and over, overweight, obese and with large waist circumference. The risks were also found greater among females who were already overweight or obese and with large waist circumference. Adults with high triglyceride level (≥ 400 mg/dL) as well as males with high fasting blood sugar level (> 125 mg/dL) were at a greater risk of becoming android obese than their normal counterparts. Alcohol-drinking and smoking correlated significantly with hypertension. Alcohol-drinking alone correlated significantly with android obesity.

Conclusions: Findings raise public health warning on emerging hypertension and android obesity among adults and corresponding preventive steps. An intensified nutrition and health promotion should aim at improving lifestyle, habits and practices.

FP11

Calculation of the Minimum Requirement of Sodium for Japanese Adults

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Aim: It was to calculate the minimum requirement for sodium by Japanese adults in terms of safety, on the basis of sodium balance and sodium metabolism.

Methods: Meals prepared from only unprocessed foods and basic ingredients without salty seasoning added were provided for 16 healthy adult men. The foods included all known needed nutrients, and met the Japanese recommended dietary allowances for adults except for salt. First, the subjects were asked to eat these specially prepared foods without salty seasoning so that the usual salt intake would decrease abruptly. Second, salty seasoning was provided with the special food, and salt was decreased in steps. Subjects collected urine and preserved 1/42 of the whole during the experimental period. Sodium, potassium, calcium, and magnesium in the experimental food, urine, stools, and sweat were assayed by atomic light absorptiometry. The concentrations of plasma aldosterone and antidiuretic hormone were measured twice weekly, and various clinical tests also were done.

Results and conclusion: The sodium balance was positive, and the plasma aldosterone concentration was higher than at the start. It seemed that the minimum requirement sodium is at least 34.1 mmol/day.

FP10

Habitual tea or coffee intake and blood pressure: An epidemiological study in a Japanese general population

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Aim: The aim of this study is to examine the relationship between habitual tea or coffee intake and blood pressure.

Methods: A total of 1,902 Japanese (785 men and 1,117 women), aged over 40 years received a population-based health examination in 1999. Blood pressure was measured twice with the subjects in the supine position. The second blood pressure measurement of systolic and fifth-phase diastolic pressure was used for analysis. Eating patterns were evaluated by a food frequency questionnaire.

Results: A significant inverse relationship between habitual tea or coffee intake and blood pressure was found after adjustments for age and sex. Especially, blood pressure levels by quartiles of increasing tannin and caffeine (major source of tea and coffee) intakes were compared using analysis of covariance, adjusted for age and sex. Systolic and diastolic blood pressure levels in the highest intakes of tannin and caffeine were significantly lower ($p < 0.01$) than those in the lowest intakes.

Conclusions: Our findings demonstrated that habitual tea or coffee intakes were associated with lower blood pressure in a Japanese general population.

FP12

Current Status of Universal Salt Iodization Programme in India.

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Aim: In India out of 282 districts surveyed 242 have been found to be endemic to Iodine Deficiency. The country adopted policy of Universal Salt Iodization (USI) in 1984. The production of iodized salt increased from 0.3 million in 1984 to 4.9 million in 1999. The study was conducted to assess the current status of salt iodization in India.

Methods: Salt samples were collected from beneficiaries in 93 districts and from traders in 69 districts in different regions of the country. A total of 65,288 and 809 salt samples were collected from beneficiaries and traders, respectively utilizing multistage sampling procedure. The salt samples were analyzed for the iodine concentration using iodometric titration method.

Results: At the beneficiary and traders level, 59% and 60% salt samples had more than 15 ppm of iodine respectively. Only, 2.8% and 1.4% of salt samples had nil iodine at the beneficiary and trader level, respectively.

Conclusion: The findings of the present study indicates the successful implementation of USI programme in India and suggest further strengthening the quality of salt at beneficiary and traders level to achieve elimination of Iodine Deficiency Disorders.

FP13

Experimental Study of the Sodium Metabolism in Japanese Females - the Urinary Sodium and Aldosterone

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Aim: The authors are investigating sodium metabolism in Japanese healthy females with free-living diets. This report discusses about the relationship between the urinary sodium excretion and serum aldosterone.

Methods: Seventy-two healthy female volunteers (19-20 years old) were investigated on their urinary sodium excretion (UNa) and serum aldosterone (Ald). First, they were examined the UNa under free-living diets. Then, they were examined the UNa and Ald under the 10-gram-NaCl diets, which were composed of natural articles of food and added 8 g NaCl (6 ml soy sauce and 7.1 g table salt). They were allowed to drink tap water or green tea freely. The UNa was measured from the 1/41.6 part of the 24-hour urine with an aliquot cup.

Results: Forty-four females completed Ald and two-time UNa measurements. The mean (and standard deviation) of UNa under free-living diets and the 10-gram-NaCl diets were 3492 (959) mg and 3110 (931) mg, respectively. The Pearson's correlation coefficient between the difference of UNa and logarithmic Ald was 0.3 ($P = 0.1$).

Conclusion: Free-living diets of these volunteers probably contained less than 10 g NaCl.

FP15

Medical Economic Effects of NST using "Potluck Party Method".

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Potluck Party Method (PPM) is a completely new system, "in which, just as at a potluck party where each participant brings a single dish of food to share, the NST is operated and managed by each department contributing a small amount of staff and power at a time". This has made it possible to operate the NST without greatly burdening the individual departments or the hospital as a whole in the face of the clamor for personnel reductions in health care today. In 1998, a first all-department-type NST using PPM in Japan was established at Suzuka General Hospital. In 2000, secondly, another all-department-type NST using PPM was operated in Owase General Hospital. In this paper we present the medical economic effect of all-department-type NSTs by using PPM in both hospitals. NST activity in Suzuka General Hospital obtained; 1) decreases in mean length of hospital stay, from 21.6 days before inauguration of the NST to 16.8 days with an increase in annual revenue of ¥120,000,000 (\$1,000,000); 2) increase in drug management and guidance fees as an annual revenue increase of ¥12,000,000 (\$100,000); 3) cost reduction of ¥4,000,000 (\$33,333) / year by standardizing the route of intravenous nutrition; 4) cost reduction of ¥1,000,000 (\$8,333) / year by introducing half meals with adequate calories for elder patients; summing the above savings yielded a total cost benefit of at least ¥137,000,000 (\$1,141,666) / year. NST activity in Owase general Hospital also earned at least ¥140,000,000 (\$1,166,667) / year as a total cost benefit. In summary, we assessed the circumstances of all-department NST activities using PPM and the medical economic effect associated with it. An increase in the hospital annual account balance was achieved as a result, and inauguration of NST had a favorable economic effect. However, we would like to stress that the basic objective of the NST is to provide patients with appropriate and high quality nutrition management, and that its economic effect is an added advantage.

FP14

Trends in Nutritional Intake and Serum Cholesterol Levels over 40 Years in Tanushimaru, Japan

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Aim: The objective was to investigate the relation between time trends in nutrient intake and serum cholesterol levels in a Japanese cohort of the Seven Countries Study, in Tanushimaru, a typical farming town on Kyushu Island, Japan.

Methods: Subjects were 628 men in 1958, 539 men in 1977, 602 men in 1982, 752 men in 1989, and 402 men and 624 women in 1999, aged 40-64 years. Eating patterns were evaluated by 24-hour dietary recall from 1958 through 1989, and by food frequency questionnaire in 1999. We also measured serum cholesterol levels in each health examination.

Results: The total daily calorie intake decreased from 2837 Kcal in 1958 to 1948 Kcal in 1999. The carbohydrate intake in percentage of total daily calories decreased markedly, from 78% in 1958 to 58% in 1999, in contrast to large increases during this period in protein intake (from 11% to 19%) and fat intake (from 5% to 23%). In proportion to the dramatic change in protein and fat intake, serum cholesterol levels showed large increases.

Conclusion: It is suggested that dietary changes in Tanushimaru in the last 40 years may have contributed to the prevention of cardiovascular diseases, however, careful surveillance is needed in the future because of the remarkable increasing intake of fats, especially saturated fatty acids.

FP16

Usefulness of Anti-Stray Stylet for Central Vein Catheterization by the Subclavian Vein Approach.

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Aim: The incidence of malpositioned central venous catheters (CVCs) verified radiographically varies from 5.5% ~ 29% by the subclavian vein approach. The most common location into which the CVC is misplaced is the internal jugular vein. We tested a new stylet that leads the catheter tip into innominate vein.

Methods: This prospective study was approved by the ethics committee in our hospital. The catheter kit has the stylet that is made of plastic and protruding 1 cm out at 45 degree angle from the distal end of the catheter. Sixty-five surgical patients who need CVC with various reasons were enrolled.

Results: In 61 of 65 patients the subclavian veins were successfully punctured. There were three cases of failure to puncture the subclavian vein and one case of artery puncture. A total 61 polyurethane catheters were inserted by the right subclavian vein approach using the stylet. No malpositioned CVC was verified radiographically in all 61 patients.

Conclusion: This anti-stray stylet designed newly is useful to insert CVCs by the subclavian vein approach.

FP17

Nutritional Support of Patients Suffering from Ileus in Early Post-Operative Period

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Aim: To improve results of surgical treatment of patients suffering from acute intestinal obstruction by formulating and usage of a program of nutritional support taking into consideration the complex morph-functional activities of the intestine.

Methods: our work was based on clinical analysis of 148 patients, who had presented with ileus and operated thereof, these patients had 2nd and 3rd degree syndrom acute enteral sufficient. The patients were divided into two groups. The 1st group patients (n=72) were fed only parenterally. In the 2nd group, we used the nutritional support program, inclusive of parenteral feeding, complex enteral detoxication methods, and early tubal feeding by means of a nasointestinal tube.

Results: it was observed that, patients of the 2nd group responded quickly from endotoxins and homeostatic changes. With the aid of the above-mentioned method, post-operative complications from acute intestinal obstruction fell to 9.7%, where as the death rate fell.

Conclusions: Nutritional support of patients, suffering from ileus, must be based on a complex usage of parenteral feeding and enteral tubal feeding with a calculated change to enteral tubal feeding which increases the nutritional value and must depend on the degree of regeneration of the functional activity of the intestine.

FP19

A Case of Glomerulonephritis Complicated with Catheter-Related Sepsis in a Long-Term HPN Patient.

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We report on a pediatric case of glomerulonephritis associated with catheter-related sepsis (CRS) during long-term home parenteral nutrition (HPN). An 11-year old boy had received HPN since March 1998 for short bowel syndrome after massive small bowel resection. The patient was admitted to our hospital due to developing hematuria and proteinuria. A urinalysis revealed 10 to 20 WBCs per high-powered field. White blood cell count and serum CRP levels were 7000/mm³ and 1.1 mg/dl respectively. Under a suspicious diagnosis of urinary tract infection, antibiotics were started. However proteinuria and hematuria had continued. Blood samples from the catheter grew *Staphylococcus epidermidis*, and serum C3d antibody level, a marker of immunocomplex level, was found to be 21.2 u/ml (normal: 3-12 u/ml). Therefore, CRS-related glomerulonephritis was suspected, and the catheter was removed. Culture of the catheter tip grew *Staphylococcus epidermidis*. Four weeks after removal of the catheter, proteinuria and hematuria disappeared, and serum C3d antibody level returned to be normal levels.

CRS-related glomerulonephritis is a rare and life threatening complication. Warnig should be made against this when a patients on long-term TPN develops hematuria and proteinuria.

FP18

Catheter and Nutritional Management for the Patient with Dystrophic Epidermolysis Bullosa: A Case Report

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Aim : Dystrophic epidermolysis bullosa (DEB) is a hereditary disease, in which there are several disease types. Chronic nutritional and growth failure is a feature of severe DEB, because of the esophageal stricture and wide area of the skin lesions. There are some problems in the nutritional management of DEB. We report a case with severe DEB, who had home parenteral nutrition (HPN).

Case report : The patient was a 16 year old boy, referred to our hospital because of the esophageal stricture. On admission, his height was 138cm and his weight was 28kg. Laboratory data showed hypoalbuminemia and severe iron-deficiency anemia. A balloon dilatation was applied to the stenosis. A subcutaneous infusion port (SIP) was implanted for HPN.

Course and problems: On the course of HPN, three times of catheter related sepsis (CRS) was noticed for one year and 6 months. SIP couldn't help being replaced every time of CRS. After a Hickman catheter was used instead of SIP, CRS didn't occur for more than one year. Another problem was hypoalbuminemia and iron deficiency due to the loss from wide area of erosive skin lesion. To improve them, administration of much more calories and large amount of iron was needed besides oral intake.

Conclusion: For the HPN management of a DEB patient, we have to pay attention to the catheter selection and patient's metabolic state.

FP20

Metabolic acidosis induced by commercially available single bag TPN solution in elderly patients.

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Aim: The aim of this study was to investigate the influence of acidity of TPN solution on the incidence of metabolic acidosis in elderly patients.

Methods: Patients were divided into 2 groups. Group-A (n=13) received single bag formula (pH4.36, TA44.1), whereas Group-B (n=13) received double bag formula (pH5.1, TA31.9) for 1 week. TA indicates titratable acidity (mEq/L). Blood gas analysis and blood chemistry analysis was done before and after TPN.

Results: Mean age of the patients in both groups are 75.8(69~82) and 75.0(68~83), respectively. After 7 days of TPN treatment, blood gas analysis revealed significant reduction of pH(7.45 ± 0.02 → 7.39 ± 0.04), HCO₃⁻ (25.8 ± 2.6 → 21.3 ± 6.2mEq/L) and BE (1.70 ± 2.59 → -3.81 ± 6.36mEq/L) only in Group-A. In addition, pCO₂ tended to lower (36.9 ± 4.2 → 34.8 ± 9.5mmHg) in Group-A. Urine-pH significantly decreased (6.23 ± 1.22 → 5.42 ± 0.34) and serum chloride elevated (100.5 ± 4.1 → 103.8 ± 2.6mEq/L) in Group-A. These parameters showed no significant change in Group-B. Anion gap and blood lactic acid in both groups showed no change.

Conclusions: These data showed that TPN solution of higher acidity apparently produced metabolic acidosis. Adding hydrochloride to adjust pH of the infusate of single bag TPN formula might be the major cause of higher acidity. We concluded that single bag TPN formula should be used carefully in elderly patients.

FP21

Preliminary Study on Chromium Concentration in Human Plasma.

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Aim : To determine the necessity of chromium supplementation during long-term Home Parenteral Nutrition, HPN, we compared plasma chromium concentrations of HPN patients with those of healthy volunteers, and also measured the chromium contents in several TPN products.

Methods : The plasma was obtained from 20 male healthy volunteers and 10 HPN patients. The concentrations of chromium in plasma and TPN products were determined by graphite furnace atomic absorption spectrophotometry.

Results : Average mean value of plasma chromium in 20 male subjects was 0.184 μ g/L (95% confidence limits : 0.061-0.654 μ g/L). Plasma chromium concentrations in the HPN patients were almost normal range, which were 0.119 to 0.671 μ g/L. The chromium contents in TPN products was 1.3 to 9.3 μ g/2L.

Conclusions : One of the reasons why plasma chromium concentration does not decrease during HPN, might be due to chromium contamination in TPN products.

FP23

Reciprocal induction of dipeptide and glucose co-transporters after small bowel transplantation

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[Aims] Small bowel transplantation is one of the most curative treatments for patients of short bowel syndrome, where the rapid recovery and maintenance of graft function are crucial. Dipeptide transporter (PEPT1) as well as amino acid transporter plays an important role for transport of nitrogen source from apical side to intracellular matrix on enterocytes. However, the mechanisms of PEPT1 induction are obscure. We investigated how small bowel transplantation affects the induction of PEPT1 on rats.

[Materials & Methods] The jejunum graft (30-cm) with aorta and portal vein was removed from the donor (BN rats) and small bowel transplantation was performed in the recipient (Lew rats) with Thiry-Vella loop. On postoperative day (POD) 7, the stumps of graft were removed and interposed into a same part of 30-cm recipient jejunum. All animals were received FK-506, 0.5 mg/kg everyday. Samples for Western blot analysis and morphologic studies were isolated at POD 7 (n=3) and 14 (n=3).

[Results] Histological analysis revealed that there was no significant difference between POD 7 and 14 on villus height and crypt depth. Western blot analysis revealed that induction of PEPT1 increased at POD 7 as compared with levels of normal rats and then decreased at POD 14. In contrast, induction of SGLT1 was decreased at POD 7, and then increased at POD 14.

[Conclusions] These results suggest that there is a different regulation in the induction of PEPT1 and SGLT1 after small bowel transplantation on rats. It seems that intestinal transplantation may be affected according to the dietary passage and necessary elements in recipients.

FP22

Amount of Trace Mineral Contents in Hospital Diet

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Aim : The Sixth Revision of Recommended Dietary Allowances (RDA) for the Japanese was published. Then we calculated the amounts of the trace mineral contents by using the menu in the hospital diets, and compared with Nutrient-based Dietary Reference Intakes (RDIs).

Methods: The seven days menus were used in fore hospitals. The menus were assumed to be general diet, soft diet (all rice gruel diet and rice gruel in half degree diet), energy control diet (1600kcal) and protein control diet (40g). The amounts of the nutrients were calculated by using "standard table of food composition in Japan" and "the amount of the trace mineral contents table of food"

Results: The fulfillment rates of Mg, Mn, Zn, Fe and Cu were 93.4%, 88.8%, 88.4%, 80% and 73.7%, respectively. The fulfillment rate of all rice gruel was lower than that of the general diet. And the rice gruel in half degree diet was more lower. The energy control diet was almost the same as all rice gruel diet. Mg, Zn and Cu of the protein control diet were about 50%. Fe of this diet was lower and the fulfillment rate was 47%.

Conclusions: In hospital diet, magnesium and iron, zinc, copper, manganese were not fulfilled compared with RDA. Especially, it has been understood that the therapeutic diets is not fulfilled further.

FP24

Interferon- γ augments uptake and transport of dietary antigen by human intestinal cells

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Background- Intestinal epithelial cells (IEC) serve a barrier function, which prevents the invasion of numerous bacteria and dietary antigens into the body. It is reported that IFN- γ is secreted in intestinal mucosa in pathological conditions such as Crohn's disease. In such conditions, antigen presentation by enterocytes and epithelial permeability were stimulated. To examine the effect of IFN- γ on the transepithelial transport system of the dietary allergen, uptake and transport of ovalbumin (OVA) by IEC were studied.

Methods- Caco-2 cells were maintained on permeable transwell filters, and transepithelial permeabilities of lucifer yellow (LY), FITC-dextran and OVA fluxes were measured. To investigate the mechanism of OVA uptake, flow cytometric experiments were performed.

Results- In IFN- γ treated cells, mucosal to serosal fluxes of LY, FITC-dextran and OVA were increased. Western blot analyses showed that OVA was degraded to small peptides during transport across the Caco-2 cell layers. The degrees of proteolysis during transfer were much greater in IFN- γ treated cells than that in control cells. Flow cytometric analysis also demonstrated that internalization of FITC-OVA was increased by IFN- γ .

Conclusions- These results suggest that human IEC may transfer the food antigen, by paracellular and transcellular routes. In inflammatory condition, intestinal transport of antigens may be greatly enhanced and the increased invasion of dietary antigens should influence the status of inflammatory bowel disease (IBD) or food allergy.

FP25

The effects of pectin, a soluble fiber, on the small intestine proliferation, fecal short chain fatty acids production and microbial population.

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Aim: We previously reported that supplementation of pectin, a soluble dietary fiber, induced epithelial cell proliferation in rat small intestine by release of enteroglucagon. In this study, we investigated the effect of pectin on rat intestinal environment such as intestinal microbial population, short chain fatty acids (SCFA), and glucose and peptide transport systems.

Methods: Control group and pectin-fed group were given a fiber-free elemental diet (ED) and an ED containing 2.5% pectin respectively. On the 15th day, we measured the wet weight, protein and DNA contents, and Ki67 positive cell ratio of the jejunum and ileum. The changes of SGLT-1 and Pept-1 mRNA levels of the jejunum and ileum were examined by Northern blot analysis. We also examined the SCFA levels and the microbial flora population of the cecum.

Results: The supplementation of pectin resulted in a significant increase of the wet weight, protein and DNA contents, and Ki67 positive cell ratio in the ileum compared with the control group, but did not affect the SGLT-1 and Pept-1 mRNA levels of the small intestine. Although there were no significant changes in the population of cecal microbial flora, such as Bacteroidaceae and Eubacterium, the cecal contents of acetic acid, butyric acid and propionic acid were all significantly increased by pectin supplementation.

Conclusions: These results indicate that the increases of SCFA levels by supplementation of pectin may induce ileal mucosal proliferation. The increases of SCFA levels were considered to be due to the increases of respective substrates.

FP27

Distribution and Localization of Mammalian Water Channel Aquaporins in Digestive Organs.

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Aim: Aquaporins (AQP), the family of water-selective channels, have been localized in various organs and tissues including digestive organs. Digestive organs, especially small and large intestine, are the main entrance for water intake to mammals. The aim of this study was to demonstrate the expression and distribution of aquaporins in and human digestive organs comparing to rat organs.

Methods: Total cellular RNA was isolated from rat and human organs. RNase protection assay was performed to examine mRNA distribution of AQP in rat and human digestive organs. *In situ* hybridization and immunohistochemistry were carried out to appear the localization of AQP in rat and human digestive organs.

Results: Both AQP1 and AQP3 mRNA were generally present from esophagus to colon in rat and human. AQP4 mRNA expression was expressed in the lower stomach and small intestine in rat. AQP8 mRNA was detected in rat jejunum, colon liver and pancreas, however, in human AQP8 mRNA was detected only colon and pancreas. AQP1 was localized in capillary endothelium through gastrointestinal tract, apical membrane (AM) of glandular cells in ileum and colon. AQP4 was demonstrated in basolateral membrane (BLM) of oxyntic gland cells of the stomach and ileal deep glandular cells. AQP3 was localized in BLM of colonic epithelium, AQP8 was demonstrated in AM of jejunal and colonic epithelium.

Conclusions: Several members of AQP were present solely or redundantly in rat and human digestive organs, suggesting their roles in the absorption and/or secretion of water there.

FP26

Effect of γ -Linolenic Acid (GLA) or Sodium Butyrate (NaBT) on Tight Junction Permeability, Proliferation and Apoptosis in Intestinal Monolayer Cells.

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Aim: The dietary polyunsaturated fatty acids and short chain fatty acids have been characterized as ecoinutrient substrates. However, the effect of GLA or NaBT on intestinal epithelial cell function has rarely been reported.

Methods: Confluent Caco-2 cells on porous membrane with double chamber system were used to measure fluorescein sulfonic acid (FS) permeability and transepithelial electrical resistance (TEER). Apoptosis was examined by cell death detection ELISA and Hoechst 33342 stain and cellular proliferation was analyzed by counting the attached cells and floating cells. Effect of 0 to 200 μ M of GLA or 0 to 5 mM of NaBT on these parameters was compared.

Results: GLA increased FS permeability to 8.8 fold and decreased TEER to 0.5 fold vs. control. ($p < 0.01$). NaBT decreased FS permeability to 0.7 fold and increased TEER to 1.9 fold ($p < 0.01$). GLA and NaBT decreased attached cell number to 81.8% ($p < 0.05$) and 36.1% ($p < 0.01$), respectively. NaBT induced apoptosis and increased floating cell number to 54.1% ($p < 0.01$), however GLA did not. It is indicated that GLA or NaBT affect the intestinal epithelial cell function characteristically. Now we are evaluating the exfoliating process to elucidate their relationship.

Conclusions: GLA or NaBT affects biological activity of intestinal monolayer cells.

FP28

The possibilities of enteral nutritional support in intestinal failure - in the rat model of acute pancreatitis

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Aim: It has been recognized that the intestine is one of the crucial self-defensive organs in the body, which is easily impaired by disusing. We investigated the possibilities of beneficial effect of enteral nutrition in intestinal failure which is caused by acute pancreatitis from the viewpoints of intestinal mucosal defense mechanism.

Methods: Male Wistar rats were fed for five days with enteral (E), parenteral (P), and oral nutrition (O). In these groups, intestinal morphological changes, the number of intraepithelial lymphocytes (IEL), apoptotic cells, production of IL2, IFN γ , and bacterial translocation (BT) occurrence were assessed. Moreover, acute pancreatitis model was accomplished by the injection of deoxycholic acid (DCA) into pancreatic duct in another male Wistar rats, which were divided into two groups. One were treated with enteral and the other with parenteral nutrition, respectively. The same indices including survival period were evaluated in these animal models.

Results: Significant higher BT occurrence, mucosal atrophy with decreased IELs, decreased IL2, and increased IFN γ production could be seen in P group, compared with those in E group. Enteral nutrition gave the same favorable effects on acute pancreatitis model, which led to being longer survival period in enteral feeding group.

Conclusions: The enteral nutritional support reduced BT and improved the survival rate in acute pancreatitis model by maintaining the intestinal integrity and immunological defence mechanism. It is suggested that enteral nutrition in intestinal failure brings out the beneficial effect in the intestinal mucosal defense mechanism.

FP29

ANTIOXIDANT EFFECT OF LYCOPENE ON SOME ENZYME ACTIVITIES IN CNS TISSUES OF MOTORNEURON DEGENERATION MOUSE DURING POSTNATAL DEVELOPMENT.

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Aim : We analyzed some neurochemical alterations of some enzymes implicating in progression of neuronal degenerative loss in brain and spinal cord tissues of motor neuron degeneration (*Mnd*) mutant mouse.

Results : Enzymatic activity of superoxide dismutase (SOD), an enzyme responsible to eliminating cytotoxic superoxide radicals produced through insufficient oxidative process in neurons, showed continuous decrease in later stages in both motor cortex and spinal cord of *Mnd* mouse. On the other hand, the activity of cytochrome c oxidase (CO), an indicator for oxidative energy production system, had also been declining continuously along with the developmental growth in both CNS tissues of the mouse. Per oral administration of a carotenoid pigment, lycopene, to *Mnd* mouse caused recovery of CO and rather augmentation of SOD activities in the CNS during developmental stages.

Conclusions : These results suggest that lycopene acts as an antioxidant agent to protect progressive degeneration of motor neurons, and cause possible retardation of appearance clinical symptoms in the mutant mouse.

FP31

Dose Response Effect of Palm Vitamin E on Gastric Parameters in Rats.

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Aim: Palm vitamin E has been shown to be beneficial in promoting the healing of Nonsteroidal anti-inflammatory drugs induced gastric lesions in rats. This study examined the effects of a palm vitamin E from palm oil on gastric malondialdehyde (MDA), acid and mucous concentrations in rats.

Methods: Fifty male rats of *Spongus-Dawley* species (200–250 g) were randomized to the five groups: Group I (n=10) was fed a normal rat chaw. Whereas Group II, group III, group IV and group V (n=10) were fed with a Normal rat chaw supplemented with palm vitamin E in a dose of 60mg/kg food, 100mg/kg food, 150mg/kg food and 300mg/kg food respectively for 4 weeks. The rats were killed after 4 weeks of feeding for the determination of gastric acid, MDA and mucous concentration.

Results: There were a significant decreased in gastric MDA and gastric acid in all the palm vitamin E supplemented groups compared to control. However these doses of palm vitamin E had no significant effect on gastric mucous concentration.

Conclusions: Our results demonstrate that Palm Vitamin E in dose of 60 to 300mg/kg of food caused a significant decreased in gastric MDA and acid concentration. These doses of Palm Vitamin E had no significant effects on gastric mucous in rats.

FP30

Comparison of HemoCue method with Cyanmethemoglobin Method for Estimation of Hemoglobin

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AIM: Hemoglobin (Hb) measurement is the primary method for assessment of anemia in a community. The Cyanmethemoglobin (CM) method is most widely used. The HemoCue (HQ) method is extensively used for estimating the Hb. This study was undertaken to compare the estimation of Hb results obtained between standard CM and HQ methods.

Methods: A hospital based study was conducted amongst adult patients attending a hospital in New Delhi. Four hundred and eighty six patients requiring hematological investigations were included. The study was conducted in two phases, Phase I and Phase II. The patients in the two Phases were independent of each other. In Phase I, Hb investigations were performed amongst 151 patients by the standard CM and the HQ methods in blood samples from the fingerpick method. In Phase II, Hb investigations were performed by the standard CM and HQ method amongst 335 patients in blood samples collected by venous puncture.

Results: For the different levels of Hb i.e. 10g/dl and more, 7-10g/dl and severe <7g/dl, HQ method overestimated Hb levels as compared to the standard CM method. On comparison of results obtained from the standard CM and HQ methods by utilizing the standard statistical procedures, it was found that HQ method overestimated the Hb levels by 1.5g/dl in capillary blood samples and by 1.2 g/dl in venous blood.

Conclusion: The findings of the present study suggest that to have scientifically valid estimation of Hb, a correction factor of minus 1.5 and minus 1.2 should be applied to the Hb values obtained from HQ method in case of capillary and venous blood samples, respectively.

FP32

Eating Behavior may depend on Single-nucleotide Polymorphisms of β 3-Adrenergic Receptor Gene and Mitochondrial NADH Dehydrogenase-2 Gene

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Aim: Human behavior on eating is also partly regulated by a biological feed-back system. We attempted to correlate any results from dietary survey with single-nucleotide polymorphisms (SNPs) of β 3-adrenergic receptor (BAR-3) and mitochondrial NADH dehydrogenase-2 (ND-2) genes.

Methods: We studied 44 students (female 40, male 4) in our university with written informed consent. SNPs of BAR-3 (Trp64Arg) and ND-2 (Leu263Met) genes were detected by PCR-RFLP with genomic DNA prepared from buccal mucosa. A semi-quantitative food-uptake frequency survey was conducted with a kit of "Jissun-houshi". Statistical multi-variant analysis was done with a software of SPSS. Body fat ratios were measured by conductivity.

Results: Out of 30 items, only vitamin C-uptake was significantly higher in Met263-type of ND-2 gene than Leu263-type. As for SNP of BAR-3, Trp64-homozygote showed significantly higher animal protein ratio and higher cholesterol-uptake than Arg64-homozygote and heterozygotes.

Conclusions: SNPs of BAR-3 and ND-2 genes may affect eating behavior in individual level besides biochemical process of signal transduction in cellular level.

FP33

Arachidonic acid deficiency in mononuclear cells and its clinical significance in HCV cirrhotic patients

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Aim: An abnormal fatty acid pattern in advanced liver cirrhotic (LC) patients has been reported in plasma phospholipids and some other tissues. We elucidated the significance of arachidonic acid deficiency on clinical pathophysiology of LC and hepatocellular carcinoma (HCC).

Methods: We analyzed fatty acid composition in mononuclear cell phospholipids, plasma α -tocopherol and tiobarbituric acid reactive substances (TBARS), and serum cytokines on 23 hepatitis C virus (HCV) infected cirrhotic patients, 12 without HCC and 11 with HCC.

Results: Significantly low levels of n-6 polyunsaturated fatty acid, linoleic (LA), eicosadienoic, dihomo- γ -linolenic and arachidonic acid (AA) in LC patients were observed compared with control subjects. The plasma α -tocopherol level was lower and TBARS was higher in HCC patients than that in control subjects. AA/LA molar ratio in mononuclear cell phospholipids was correlated significantly with lymphocyte and platelet count in the cirrhotic patients. The serum IL-12 level tended to correlate with the AA/LA ratio.

Conclusions: These results suggest that n-6 fatty acid composition in mononuclear cells may have an important role in progression of HCV cirrhosis. Nutritional management preventing fatty acid peroxidation and maintaining AA and other polyunsaturated fatty acid levels may have some beneficial effects on the progression of HCV chronic liver disease.

FP35

L-Asparaginase Inhibits a Signaling in Leukemic Cells.

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Aim: L-Asparaginase (Asnase) is widely used in the treatment of acute lymphoblastic leukemia. Asnase converts asparagine (Asn) and glutamine (Gln) to aspartate and glutamate, respectively, and suppresses growth of malignant cells that are more dependent on an exogenous source of Asn and Gln than are normal cells. It is unclear which signalings in leukemic cells are affected by Asnase.

The effects of Asnase on p70 S6 kinase (p70^{sk}) and eukaryotic initiation factor 4E-binding protein 1 (4EB1) were investigated.

Methods: The activity and phosphorylation of p70^{sk} and 4EB1 were measured by kinase assay and immunoblotting.

Results: Addition of Asnase to human leukemic cells inhibits activity of p70^{sk} and phosphorylation of 4EB1, but not activities of other cell growth-related serine/threonine kinases. The kinetics of p70^{sk} inhibition by Asnase were comparable to those seen by deprivation of Asn and/or Gln from cell culture media.

Conclusions: These data indicate that Asnase targets a signaling pathway in leukemic cells and the effect of Asnase on p70^{sk} is explained by depletion of Asn and/or Gln.

FP34

Effects of late evening snacks with branched chain amino acids supplementation on substrate oxidation and quality of life in patients with liver cirrhosis

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Aim: The purpose of this study was to demonstrate the effects of the late evening snacks (LES) with branched-chain amino acids (BCAA) on substrate oxidation and the quality of life (QOL) in patients with liver cirrhosis.

Methods: Ten cirrhotic patients given LES with BCAA supplementation (BCAA-G; 4g of BCAA), 10 cirrhotic patients given LES without BCAA-G and 3 control subjects (cirrhotic patients not given LES) were included in this study. To compare the effect on substrate oxidation with or without BCAA-G, indirect calorimetry was assessed at 6 AM after overnight fasting. QOL was assessed by the QOL questionnaire; short form-36 (SF-36). The LES contained about 40g of carbohydrate.

Results: The utilization of carbohydrate increased with a decrease in fat oxidation in LES-treated patients with and without BCAA-G. The improvement of carbohydrate utilization in patients with BCAA-G (from 36.6 ± 12.0 to 66.3 ± 5.0 ; $p < 0.05$) was larger than those without BCAA-G (from 36.5 ± 18.0 to 43.8 ± 4.0). QOL levels improved in LES-treated patients with and without BCAA-G, especially in the scale of the physical functioning and the role limitation due to emotional problems. The LES-treated patients with BCAA-G showed the better QOL levels.

Conclusions: These data suggested LES improved nocturnal fasting and QOL. BCAA-G may improve fuel utilization and QOL levels.

FP36

PALM VITAMIN E PROTECTS BONE AGAINST DEXAMETHASONE-INDUCED OSTEOPOROSIS IN MALE RATS

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Aim: Long-term steroid treatment is known to cause osteoporosis. Free radicals have also been implicated in osteoporosis. Vitamin E, a strong antioxidant, has been shown to be effective in preventing osteoporosis due to estrogen and testosterone deficiency, and thyroid hormone excess in animals. Palm oil-derived vitamin E extract contained a mixture of 24.82% α -tocopherol, 20.73% α -tocotrienol, 26.68% δ -tocotrienol and 13.32% γ -tocotrienol. The aim of this study was to determine the effects of palm oil-derived vitamin E on steroid-induced osteoporosis.

Methods: 3-month old male Wistar rats were divided into 7 groups a) sham-operated, SH-OP (G1), b) adrenalectomised, Adrx (G2), Adrx + palm vitamin E 60 mg/kg, PVE60 (G3), Adrx + dexamethasone, Dex 120 μ g/kg (G4), Adrx + deoxycorticosterone 24000 μ g/kg, Doc (G5), Adrx + Dex + PVE60 (G6), Adrx + Doc + PVE60 (G7). Treatment period was 4 months.

Results: Bone mineral density, bone calcium content and femur length did not increase in G4 animals, whereas there was a significant increase in all the other groups including G6.

Conclusions: The results confirmed that palm oil-derived vitamin E was effective in preventing steroid-induced osteoporosis, however the mechanisms involved needed further study.

FP37**Impact of simultaneously infused fat emulsion during postoperative peripheral parenteral nutrition and the application to elderly patients.**

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<Aim> Although peripheral parenteral nutrition (PPN) have recently been considered to be suitable for the nutritional management for surgical patients with moderate stress, the adequate ratio of each energy substrate in PPN should be elucidated. The aim of the present study is to evaluate the effect of PPN with fat emulsion for patients underwent surgery, especially elderly patients.

<Materials and Methods> Thirty-three patients with moderate surgical stress (8 gastrectomy, 19 colo-rectal resection, 6 partial hepatectomy) were randomly divided into two group, PPN group (n=21) and C group (n=12). PPN group underwent the nutritional management with glucose(G),+ amino acid(A) + fat emulsion(F) for 6 days from 1 POD. The patients in C group were administered by approximately isocaloric and iso-non-protein caloric formulas constituted with G + A via central venous line. Rapid turnover protein (RTP) levels were measured and energy expenditure, RQ, and oxidation of energy substrates were calculated by indirect calorimetry at 0, 1, 3, 7 postoperative days (POD).

<Results> RTP levels in PPN group were significantly higher than those in C group at 7 POD. Energy expenditures in both groups were approximately equal and amount of fat oxidation at 7 POD was elevated in PPN group. In elderly patients at the age of 80 or over in each group, RTP levels in PPN group (n=6) were higher than those in C group (n=7) at 7 POD, although preoperative RTP levels in PPN group were low compared with those in C group

<Conclusions> PPN with fat emulsion improved protein metabolism in postoperative patients, even elderly patients, with moderate stress in comparison with isocaloric nutrition care composed of glucose and amino acid.