TSF, RBP AND TBPA AS NUTRITIONAL INDICES IN SURGICAL PATIENTS WITH GYNECOLOGICAL CANCER

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Summary: The Authors investigated the usefulness of some biochemical markers of visceral protein sinthesis (TSF, TBPA and RBP) in 24 patients affected with gynecological cancer and treated with Total Parenteral Nutrition in the perioperative period. The absence of an improveing TSF and TBPA is related to increased morbidity and mortality.

INTRODUCTION

Intravenous nutrition is a well-established part of clinical practice. For this treatment to be effective, it is necessary to ensure that the nutrients infused are adeguate and are being utilized efficiently.

A correct evaluation of nutritional status in surgical patients is mandatory in perioperative assessment.

Visceral proteins as transferrin (TSF), prealbumin (TBPA) and retinol binding protein (RBP) have been suggested as biochemical markers of nutritional progress and are used in some nutritional assessment program.

Previous work has suggested that transferrin and pre-albumin are good dynamic indices of nutritional status ([2, 5, 8]), and in this paper we present the results of a study in gynecological surgical patients.

PATIENTS AND METHODS

24 patients were studied. The age range was 19 to 71 years with a mean of 52.4 ± 12.1 years.

There were twelve patients with ovarian cancer on third stage and three on fourth stage, seven with portio cancer and two with uterus cancer, all of them undergoing to radical surgical intervention.

Total parenteral nutrition (TPN) was instituted post-operatively in all the patients with a relatively high caloric regimen (40 ± 5 Kcal/kg b.w./day) with a lipid-glucose system (40% lipids of total calories) and 0.24 g/N/kg b.w./day.

TPN solution were prepared in a three-liter bag with the appropriate amount of electrolytes, trace elements and vitamins. The intravenous solution was administered through a giugular or subclavian catheter by means of a constant infusion pump.

Blood samples to determine serum TSF, TBPA and RBP levels were collected before commencing TPN and there after at two days interval for nine days.

TSF assays were performed with nephelometric method ([7]) while TBPA and RBP were measured by the technique of radial immunodiffusion assay ([9]).

In the post-operative period we recorded the incidence of complications as delayed wound healing, fistulae, infectious complications and/or sepsis and final outcome of the patients.

Results were analyzed with t-student test.

RESULTS

Complications occurred in 8 patients that died in 17±6 days after operation (group A) while 16 patients did not undergo to mayor complications and were dismitted from the hospital after 12±3 days (group B). In table 1 the groups are divided on the basis of their pathology.

The effect of operation and post-operative TPN on TSF, TBPA and RBP is shown in figures 1 to 3.

Serum transferrin (fig. 1) was pre-operatively low in group A but not significatively lower than group B.

After three days the difference between the groups is significative ($*P < 0.05$) with a progressive reduction of serum values in

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Table 1.

Group A (Dead) 8 Patients			*Group B (Survivors)* 16 Patients		
Ovarian cancer	IV stage	No. 2	Ovarian cancer	IV stage	No. 1
Ovarian cancer	III stage	No. 4	Ovarian cancer	III stage	No. 8
Portio cancer	III stage	No. 2	Portio cancer	III stage	No. 5
			Uterus cancer	III stage	No. 2

group A that continues after 9 days (**$P<0.01$).

Serum prealbumin (fig. 3) was preoperatively low in both groups (16 mg) and after a similary reduction in both groups we observed a increase of serum levels only in group B with significative difference on 7th day (*$P<0.05$).

Serum RBP did not show any significative difference between the groups during the study period.

DISCUSSION

A combination of several tests as anthropometric measurements, serum proteins and immune function are used to predict morbidity and mortality in surgical patients ([3]).

Although Nitrogen Balance (NB) is sometimes used for dynamic nutritional assessment to ensure that the nutrients infused are adequate and are being utilized efficiently, this technique is not generally available outside specialized units.

As practical alternative to NB, serum proteins are useful for assessment of nutritional status and are considered to be a reflection of visceral protein stores ([4]).

Since albumin has a half-life of 20 days ([13]) it is a poor predictor of malnutrition ([8]).

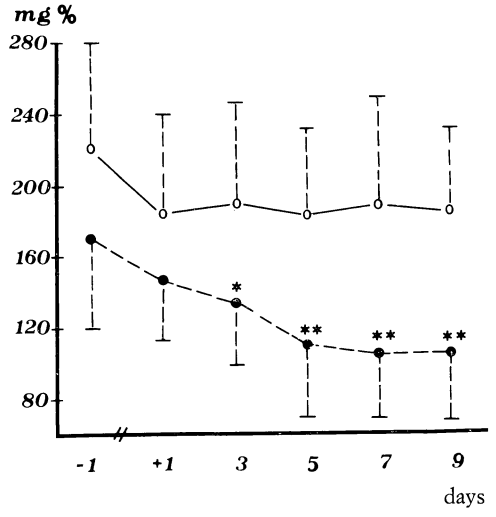

Fig. 1. — Transferrin levels in group A (●) and group B (○), mean values ± SD.

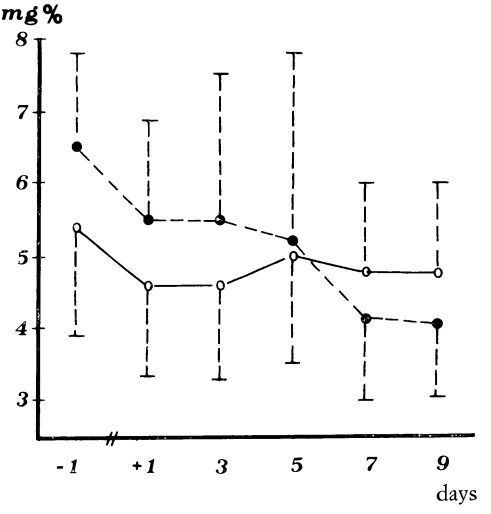

Fig. 2. — Retinol binding protein levels in group A (●) and group B (○), mean values ± SD.

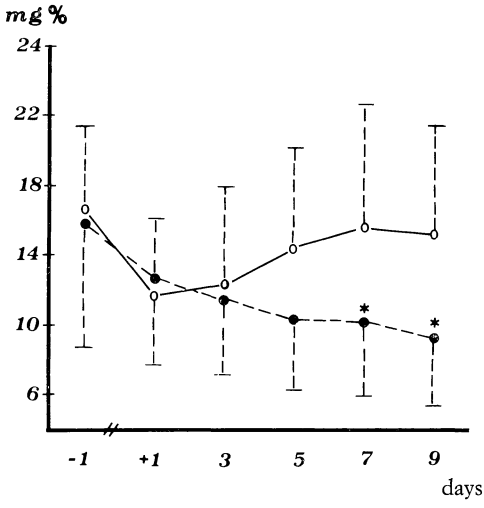

Fig. 3. — Prealbumin levels in group A (●) and group B (○), mean values ± SD.

Serum transferrin has a shorter half-life of about 8 days ([8]) and therefore is more sensitive to changes in nutritional status.

Its usefulness is well established in protein calorie malnutrition ([6, 10, 11]) but its role as indicator of Nitrogen Balance remains controversial.

A rising transferrin level is a reasonably good indicator of a positive Nitrogen Balance, but a falling transferrin level is a poor indicator of the reverse ([4]).

Our results confirm that serum TSF is increased in patients that have no complications and this is significative after only 3 days from surgical intervention. These patients respond to TPN with a anabolic reaction, while patient of group A, with worst outcome, did not respond with increase of protein visceral status. In our study TSF showed the most significative and earlier negative change in the post-operative period in complicated patients (fig. 1).

All the visceral proteins that we investigated were reduced from basal levels during the first three days after operation and this is to be expected as a part of the stress response ([1]).

Prealbumin is however more rapidly improveing in patients with no complications (fig. 3).

Presumably the change in transferrin reflects the lack of an improved visceral protein status early in the first week, while prealbumin reflects an improved protein sinthesis later in the week.

Therefore the two proteins are suggested as valuable markers by which the effectiveness of nutritional support can be monitored and an useful index of the risk of complication in patients undergoing mayor surgery.

Serum prealbumin (TBPA) has the shortest half-life of the commonly measured plasma proteins (2 days) ([15]) and it is therefore a sensitive index of visceral protein status in patients receiving TPN ([5]) and affected with cancer ([2]).

Our results confirm these studies ($P<0.05$) althought the significativeness is reached after 7 days from operation.

RBP could be expected to change very rapidly in respect of changes in nutritional status since its half-life is very short (12 hours) ([12]).

During our period of study (19 days) we did not record a significative difference in RBP values batween the groups of complicated and uncomplicated patients.

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