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Editorial

NUTRITIONAL SUPPORT OF THE GYNAECOLOGIC ONCOLOGIC PATIENT

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Malnutrition is frequently seen in cancer patients. This may be secondary to the disease or to therapy. Adequate attention should be paid to the nutritional needs of these patients to maintain body cell mass, metabolic processes and tissue repair. It is therefore necessary to review periodically the nutritional assessment and identify nutritional defiencies that may need to be corrected.

Nutritional Assessment : The following simple measurements should be obtained from all gynaecologic oncology patients.

Weight: A recent unintentional weight loss of 10% or greater may indicate malnutrition. Weight less than 90% of ideal body weight may also indicate malnutrition.

Height : Height and frame size are parameters used to estimate ideal body weight. An estimate of ideal weight can be obtained by allowing 100 pounds for the first 60 inches of height and adding 5 lbs for every additional inch of height. Adjust for frame size by substracting 10% for small frame, and adding 10% for large frame.

Total Lymphocyte Count : A decrease in the lymphocyte count is seen with decreased visceral proteins. A total lymphocyte count below 1,500/cu.mm. may indicate malnutrition.

Serum Albumin : A concentration

below 3.5 gm./dl. may indicate malnutrition.

Skin Tests : A negative response to skin testing for candida, mumps, streptodornase, streptokinase and PPD, indicates impaired cellular immunity and indirectly indicates visceral protein status.

Serum Transferrin : Serum transferrin has a half life of 8 days. Therefore it shows decreased levels very soon in the presence of decreased visceral proteins.

Anthropometric measurements : Muscle and fat wasting can be measured from mid-arm muscle circumference and triceps fold. These readings can be compared to the normal expected for sex and age.

Definition of Malnutrition

A malnourished woman will show physical signs of protein malnutrition (Kwashiorkor) or protein-calorie malnutrition (marasmus).

1. Kwashiorkor : Severe protein malnutrition causes changes in skin turgor; hair colour and consistency. There is oedema, ascites and enlargement of the liver.

2. *Marasmus :* Severe protein calorie deprivation in a patient leads to cachexia with muscle and fat wasting. Fortunately most gynaecologic oncology patients are not severely malnourished. Marasmus is diagnosed if the following criteria are present.

i) Recent unintentional weight loss 10% or more.

ii) Serum Albumin of less than 3.5 gms./dl.

iii) Total Lymphocyte count below 1,500/cu.mm.

iv) Negative response to skin tests.

v) Serum transferrin less than 200 mg./dl.

Degree of malnutrition :

The estimate of degree of malnutrition can be gauged as under:

Test	Malnutrition		
	Mild	Moderate	Severe
Albumin (gms/dl)	3.0 - 3.5	2.5 - 2.9	<2.5
Transferrin (mg/dl)	180 - 200	160 - 179	<160
Lymphocytes (cu.mm)	1,500 -1,800	900 - 1499	<900

Nutritional Support

Nutritional support is best achieved via the gastrointestinal (GI) tract. If the GI tract cannot be used, peripheral parenteral nutrition (PPN) or total parenteral nutrition (TPN) through a central line should be considered as an option to provide calories, and essential nutrients to promote anabolism.

Caloric Requirements : An average individual requirements about 30 Kcal/Kg/Day. This formula can be used to estimate the requirements and can be adjusted according to the patient's response.

To determine the kilocalories (kcal) being delivered, the following formulae can be used.

1. Kcal = grams of amino acids (proteins) x 4
2. Kcal = grams of carbohydrates x 4 (oral administration)
3. Kcal = grams of fat x 0.

The ratio of non-protein calories to nitrogen should be 150 - 200:1. This may need to be lower (eg. 100:1) in high stress

patients and higher (300:1) in nitrogen retaining states (eg. renal or hepatic failure). It is recommended that no more than 60% of caloric requirements should be provided by fats.

Fluid Requirements : An average of 1,500 ml of fluids/m^2 of body surface area is needed per day. The daily requirements of sodium and potassium are 60 mEq./M^2 and 30-40 mq. Eq./m^2 respectively.

Enteral Nutrition : Whenever possible, oral feeding of the patient should be encouraged. If the patient is not eating, tube feeding can be instituted. In Western countries, enteral formalae feeds are available for use in such patients (eg. Enrich, Isocal, Precision Isotonic). These polymeric mixtures contain proteins, fats and carbohydrates. They are isosmolar and supply 1 Kcal/ml. These formulae are unpalatable and should be given by tube feeds.

Predigested nutrient feeds are also called elemental feeds because they contain aminoacids as the nitrogen source and oligosaccharides as the carbohydrate source. These are useful in patients with an abnormal G.I. tract. These feeds have a high osmolality and may cause diarrhoea. These are of low viscosity and may be administered by 'needle catheter jejunostomy'.

Tube Feedings : Continuous infusion is the simplest and safest way to administer tube feedings. It is least time consuming and ensures maximum staff compliance. With this technique, elevation of the head-end of the bed is required. Intermittent rest periods allows the patients intervals of rest in the horizontal position. Hyperosmolar medications like Kcl. may cause diarrhoea.

Infusion through the nasogastric feeding tube is started at the rate 50 ml/hr. and is gradually increased according to the tolerance of the patient.

Peripheral Parenteral Nutrition

Peripheral parenteral nutrition can be used in patients in need of nutritional support, but who are not hypercatabolic and whose G.I. tract is expected to be functional within 5-7 days. It can also be used to supplement oral feedings of patients whose oral intake is inadequate.

SUGGESTED FORMULATION FOR PERIPHERAL PARENTERAL NUTRITION

Component	Quantity
Dextrose	500 ml.
Travasol 5.5% with electrolytes	500 ml.
Sodium	35 mEq/L.
Chloride	35 mEq/L.
Potassium	30 mEq/L.
Phosphate	30 mEq/L.
Magnesium	5 mEq/L.
Acetate	50 mEq/L.

Multivitamins

The above combination provides one litre of solution containing 27.5 g amino acids, and 50 g. of dextrose together with electrolytes. This solution has an osmolality of about 530 m Osm/L and contains 280 kcal/L. Infusion of 2 litres of this solution and 1 litre of Intralipid 10% (1.1 kcal/ml) provides 1,660 kcal in 24 hours. Increasing the concentration of dextrose or aminoacids leads to phlebitis.

Total Parenteral Nutrition : Total parenteral nutrition provides enough calories to support a malnourished hypercatabolic patient with a defective G.I. tract. These should be given through a central venous line. Special formalae are available for infusion into the central line.

SUGGESTED FORMULATION FOR TOTAL PARENTERAL NUTRITION

Component	Quantity
Dextrose 25%	500 ml.
Astimyn with electrolytes	500 ml.
Sodium	30 mEq/L.
Chloride	30 mEq/L.
Potassium	20 mEq/L.
Magnesium	5 mEq/L.
Calcium	5 mEq/L.
Phosphate	10 mEq/L.
Acetate	62 mEq/L.

Additives such as multivitamins like M.V.I. and trace elements are added on.

Besides providing aminoacids, addition of fat emulsion (eg. Intralipid 10% or Winthrolipose) helps to build up calorie requirements.

Total parenteral solutions are hyperosmolar and should be administered through a central venous line by an infusion pump.

The caloric intake should be increased gradually to avoid intolerance.

Complications of this mode of therapy include hypoglycaemia on sudden discontinuation of hyperalimentation which may occur due to mechanical problems with the central venous line.

Hyperosmolar, hyperketotic coma may occur in latent diabetics.

Elevation of liver function tests may occur 10-15 days after continuous hyperalimentation.

Hyperchloremic acidosis, prerenal azotemia, altered pulmonary ventilation, hyperlipidaemia, microembolism, fatty infiltration of the liver, platelet dysfunction and catheter related complications have to be guarded against.

Follow-up monitoring of all such patients must include:

1. Daily weight chart.
2. Fluid intake and output.
3. Nutrient intake analysis (calorie count)
4. Urine for glucose and acetone 8 hourly.
5. Weekly serum albumin, transferrin, Prothrombin time, Partial thromboplastin time, Triglycerides.
6. Twice a week CBC, Total lymphocyte count, Platelets, Serum electrolytes, Na, K, Cl, HCO_3, Ca, Mg. and Liver function Tests.

FOLLICULAR DYNAMICS, ENDOMETRIAL MATURATION AND CERVICAL MUCUS QUALITY IN CLOMIPHENE INDUCED VERSUS SPONTANEOUS CYCLES — A TRANSVAGINAL SONOGRAPHY STUDY

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Summary

Since the advent of high resolution endovaginal sonography precise and clear-cut demarcation of endometrial dynamics has become possible. It could be a simple, quick and practical alternative to estradiol estimation in ascertaining follicular functional maturity. In normally ovulating subjects follicular diameter maintains a linear correlation with the estrogenic expression on endometrium and cervical mucus secretion. By 12-13th day of cycle (28-30 days cycle) average follicular diameter was 20 mm, and all subjects had late proliferative endometrium (8mm or more in thickness) and 92.30% evidenced optimal cervical mucus secretion. Hence, a routine TVS by 12-13th day of cycle is advisable in infertility evaluation to evaluate the functional maturity of the follicle, for proper timing of PCT and to identify local cervical or endometrial factor compromising fertility.

In CC induced cycles endometrial proliferation lags behind by more than 1 mm, and only 81.82% have late proliferative endometrium when the follicle was 18 mm or more. This effective endometrial responses could lead to LPD and explain, atleast in some, the conception failures even after successful induction of ovulation. In 33.33% the cervical mucus sperm penetration was inadequate, because the eervical mucus secretion was poor (spinbarkeit of less than 5 cms or no mucus).

Ultrasonography is now a well-established tool for the investigation and treatment of the infertile woman. Abdominal sonography through a full bladder has been shown to be valuable in monitoring follicular development. Vaginal sonography has been introduced recently and has a number of additional advantages which include improved resolution with sharp follicular outine and an excellent opportu-

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