

THE IMPORTANCE OF MONITORING AND FOOD ADMINISTRATION IN CRITICALLY ILL PATIENTS

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Abstract. Beside medical or surgical therapy, the nutrition of critically ill patients is of major interest because catabolic and anabolic processes need to intertwine. For a correlation between therapy and nutrition, one must take into account the physiological and pathophysiological mechanisms of stress response comprising of the neuroendocrin, immune and metabolic responses. For critically ill patient the attending team must take into account all the factors involved in illness: the status of the patient at the moment of admittance for establishing the caloric needs and the proportion between proteins, fat, trace elements and vitamins, and also the route of nutrition. We present a retrospective study on 564 critically ill patients admitted into 2nd Intensive Care Unit of County Hospital Arad. The conclusions underline positive and negative results regarding the correct nutrition.

Keywords: Critically ill patient, enteral nutrition, parenteral nutrition, artificial nutrition.

INTRODUCTION

The critically ill patients have multiple organic injuries with profound effects caused by multiple factors: surgical or traumatic aggression ischemia, sepsis, immobilization and stress, etc. It is extremely important the way in which nutrition is obtained is extremely important 80% being realised artificially. This process must sustain the simultaneity between degradation and synthesis, the two processes being intertwined.

Artificial nutrition is an active therapeutically method which resemblance the other therapeutic interventions, medical or surgical, and has the goal of replacing oral nutrition which in critically ill patients can't be obtained.

Lack of nutrition leads to malnutrition which can increase the propensity to sepsis prolongs the mechanical ventilation dependence and favours other complications.

In critically ill patients, patophysiology are involved neuroendocrin and immunologic responses. It's being known that a stress response through chemical mediators try to balance the homeostasis. The neuroendocrin and hypothalamo-pituitary axes can be

stimulated by neuronal and hormonal incentive released by macrophage and lymphocytes.

The afferent impulses stimulates the release of hypothalamic factors (CRF, VIP) which in turn will stimulate the release of pituitary hormones like proopiomelanocortine, prolactine, vasopresine and growth factor. The plasmatic level of vasopresine is increased after a multitude of stress causes traumatic, surgical, lung infections, myocardial infarction, associated or not with left ventricular failure. There is a direct link between the plasmatic level of vasopresine and the duration and intensity of the stress.

Also linked with stress the stimulation by CRF of the medulosuprarenal gland determines the release of catecholamines and kefalines. The tireostimulant hormones (TSH), foliculostimulant (FSH) and luteinisant (LH) are not significantly increased by stress, LH and FSH decreasing in the first day after surgery.

The catecholamines, adrenaline, noradrenaline, dopamine are found in blood stream in a free form and bonded (60%-90%) forms and their level is increased in stress: hypotension, hypothermia, hypercapnia, trauma. Also involved in the stress response in critically ill patients are the glucocorticoid

and steroid hormones through gluconeogenesis, proteolysis, and alanin synthesis and also through sensitisation of adipose tissue to the action of lipothical(GH catecholamines). They also have anti-inflammatory effects.

Glucagon increase AMPc in hepathocytes and favours gluconeogenesis and insulin has the opposite effect. Glucagon increase glicogenolysis, lypolysis and cetogenesis in liver, in the periods of lack of nutrition and diabetic cetoacidosis.

The growth hormone produces intolerance to glucose by blocking liver post insulinic receptors and GH increase lypolysis and incorporates amino acids into proteins. There is also an immunologic response to stress involving the increase of plasmatic level of: IL 1, TNF, Cellular growth factor T, plachetar activating factor and bradikinin.

In critically ill patients the metabolic response is increased by hormonal and immunological means, directly linked with the magnitude of the aggression. This response involves a global growth of the metabolism through glucidic and lipidic metabolical imbalance, protein homeostasis, water and sodium retention. The morbidity and mortality of critically ill patients depends on multiple factors:

Age, prior status, present illness, prior illness, surgical interventions and by the nutritional status at the moment of the first signs of disease. In critically ill patients the evaluation of the nutritional status is difficult but very necessary for recognizing and prevention of denutrition. For evaluating the nutritional status is necessary to perform anamnesis, physical exam, adipose tissue reserves, arm circumference, muscle area of the arm, biological markers, immune tests, late hypersensitive tests, protein loss evaluation and prognosis nutritional indexes.

The artificial nutrition is indicated when the patient can't, won't or the illness doesn't allow food intake by natural means. For that the intensive care specialist or the medical team treating the patients are forced to chose an artificial nutrition technique, enteral, parenteral or mixed nutrition.

Enteral nutrition

Is used when the digestive tract is functional. When oral intake is impossible nutritional products are introduced into the stomach or jejun through naso-

gastric or naso-duodenal tube or through esophagostomy or gastrostomy.

Parenteral nutrition

Defines a nutrition procedure indicated in situations in which the digestive tract it's not functional or the enteral route is counter indicated. Parenteral nutrition could be total (TPN) when it's goal is to insure the entire nutritional need or could be assisted parenteral nutrition when is needed just to supplement the energetic and proteic needs . It is realised by a central venous catheter (jugular, basilica or sub clavian vein), the most efficient being the sub clavian vein.

Mixed nutrition

We consider it to be the most efficient and beneficial regarding the etiology, tolerance, indications, evolutions and complications of the basic disease. Every route of nutrition is being indicated taking into account the advantages and efficiency not excluding the disadvantages and is monitored through biological parameters daily(weight, input and output balance, intestinal function, glycaemia, electrolytes, blood urea nitrogen, creatinine, calcium, transferine, liver test and nitrogen balance evaluation.

Nutritional products

For enteral nutrition there is a large array of products which are categorized in:

- Isocaloric(osmolite, isocal, entuse, etc)
- By proteic content(Sustacal, trammocal)
- By lipid content(long chain triglycerides LCTS)
- By fibres content(KAOPECTATE)

All this products are used in function of patient needs.

Parenteral nutrition products

Glucides, proteins and lipids with additives (glucose 5%, 10%, 50%)

- Fructose (Xilitalol)
- Proteins
- proteins in levogir mixture of amino acids (arginine, glutamine, leucin, isoleucin, ornitin, alphacetogluarat(ACO):salvamin, aminoplasmal, aminosterile
- lipids (Liposyn 10%, Intralipid, Oleic Acid, Linoleic Acid, Palmitic Acid)

On these, the necessary vitamins and oligoelements must be added

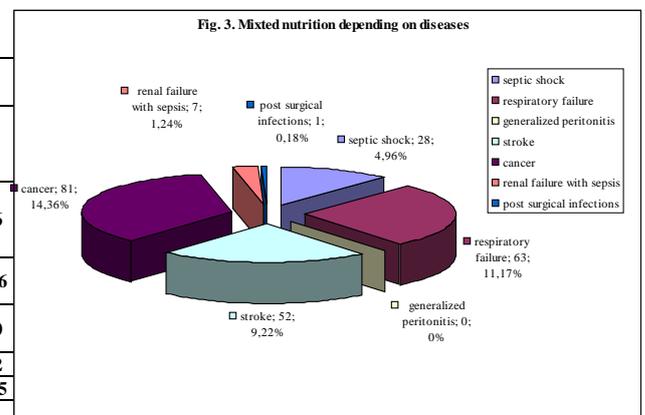
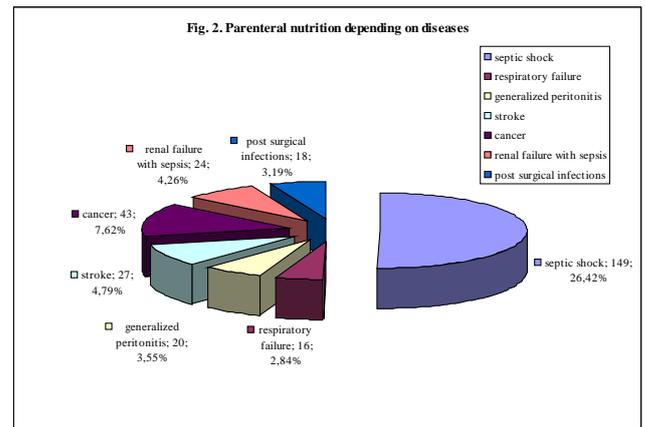
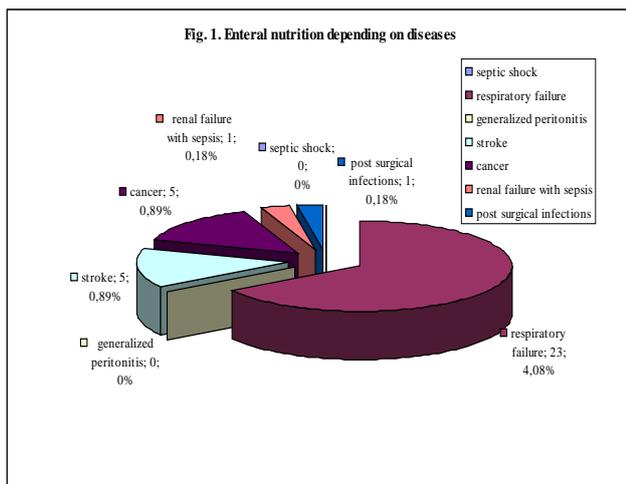
Material and method

We present a statistical study on 564 critically ill patients admitted to 2nd Intensive Care Unit of County Hospital Arad in the year 2012.

They were divided in three groups fed through the three nutritional routes mentioned : enteral, parenteral and mixed; with the same illness but with different co morbidities. All patients were critically ill and were fed 7 to 10 days while taking into account the evolution. The nutrition was performed after computing the caloric needs and the proportion between glucides, lipids and proteins using standard products by all kinds.

Table no.1 Different nutrition types of critical patients

No.	Pathology	Group I Enteral		Group II Parenteral		Group III Mixed	
		Number	%	Number	%	Number	%
1.	Septic shock	0	0,00	149	26,42	28	4,96
2.	Respiratory failure	23	4,08	16	2,84	63	11,16
3.	Generalized peritonitis	0	0,00	20	3,55	0	0,00
4.	Stroke	5	0,89	27	4,79	52	9,22
5.	Cancer	5	0,89	43	7,62	81	14,35
6.	Renal failure with sepsis	1	0,18	24	4,26	7	1,24
7.	Post surgical infections	1	0,18	18	3,19	1	0,18
	TOTAL	35	6,22%	297	52,67%	232	41,11%



RESULTS AND DISCUSSIONS

From this study one can conclude that enteral nutrition was used in few patients (6,22%) in all the spectre of disease being counter indicated in toxic-septic shock and peritonitis. The greatest percent in the second group is being represented by parenteral nutrition, 52,67% (glucid, proteins and lipids products). In the third group a mixed nutrition was used (enteral and parenteral) – 41,11% and was well tolerated. It can be noted the fact that on the span of 7-10 days in which the study was conducted, 93 (16,48%) patients died by complication well beyond therapeutical means. Complications due to nutrition:

- first group 3 cases of gastric intolerance (enteral nutrition was stopped)
- group 2 70 cases septic and metabolic complications

- group 3 19 cases – gastric intolerance, mechanical complications, catheter infections, insertion accidents of great vessels

CONCLUSIONS

1. Enteral nutrition in critically ill patients is not indicated.
2. For a correct nutrition is appropriate to calculate the caloric needs and the balance between glucids, proteins and lipids supplemented by trace elements and vitamins.
3. The most appropriate and efficient nutrition method in critically ill patients is the parenteral route followed by the mixed method.
4. Besides monitoring the drug therapy is mandatory to monitor the nutrition of critically ill patient.

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