EFFECT OF THE PROBIOTIC BIOSTIM LBS IN ACUTE INTOXICATION AFTER INDUSTRIAL ACCIDENTS

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ABSTRACT

A probiotic is a "live microbial food ingredient that, when ingested in sufficient quantities, exerts health benefits on the consumer". The profound research of a range of Bulgarian scientists has allowed for the development in the last 15-20 years of original Bulgarian probiotic, milk-acid low-lactose products, united in the Biosim LBS (Lactoflor, Biomilk) series. This survey gives an overview of the effect of probiotic Biostim LBS in acute intoxications after industrial accidents. The mean energy values in kcal of the nutritional therapy applied intravenously and via oral route in 186 patients with intoxications with moderate severity are presented. The data show that Biostim LBS covers a mean energy value of 45.36% of the food applied orally in the group with moderate and 70.86% in the group of patients with severe intoxication. These results have been achieved owing to the correct choice of therapy which have included mutually additive enteral and parenteral medications. In none of the patients adverse events have been observed regarding the parenteral medications and the enterally introduced Biostim LBS as well. They exerted beneficial effect on the metabolism, improved body energy levels and contributed to the absorption of energy and proteins. A special attention should be paid to the probiotic properties of the viable cells of L. bulgaricus, which favorably influence on the organism of the patients by improvement and regulation of the internal bacterial equilibrium.

Key words: probiotic Biostim LBS, Lactobacillus bulgaricus, intoxication, energy, nutritional therapy

INTRODUCTION

A probiotic is a "live microbial food ingredient that, when ingested in sufficient quantities, exerts health benefits on the consumer". Probiotics exert their benefits through several mechanisms. They prevent colonization, cellular adhesion and invasion by pathogenic organisms. Besides they have a direct antimicrobial activity and modulate the host immune response. The strongest evidence of the clinical effectiveness of probiotics is provided by their use for the treatment of acute diarrhea, attenuation of antibiotic-associated gastrointestinal side effects, and prevention and treatment of allergy manifestations. The profound research of a range of Bulgarian scientists has allowed for the development in the last 15-20 years of original Bulgarian probiotic, milk-acid low-lactose products united in the Biosim (Lactoflor, Biomilk) series. Their composition is represented on Table 1 (1).

The aim of this survey was to give an overview of the effect of probiotic Biomilk in acute intoxications after industrial accidents.

MATERIAL AND METHODS

The dairy product Biomilk was applied as nutrition therapy agent in combination with parenteral solutions. The study covered 234 adult patients of both genders presenting with different types of acute intoxication. Of them, 48 patients presented with severe intoxications and 186 ones - with moderate intoxications. They were hospitalized in the Clinic of Toxicology, Naval Hospital of Varna, in the Clinic of Toxicology at the Military Medical Academy and N.I.Pirogov of Sofia. The intoxications resulted from a toxic smoke during fire; inhalatory poisoning with gasoline in a closed room; as a consequence of cleaning of tanks containing petroleum oil products and of industrial accidents with polyvinyl chloride and dichlorethane.

The therapy schedule included enteral and parenteral medications which ensured the necessary energy for 24 hours (in kcal) after Harris-Benedit equation. The part of the energy provided by Biomilk peroral intake in doses of 125 g/day in water solu-
tion in the patients with moderate intoxication and 250 g/day in
the patients with severe intoxication was estimated. The clinical
investigations were timely approved by the Ethical Commission
of the Higher Military Medical Institute at the Military Medical
Academy of Sofia, and The National Emergency Institute "N.

RESULTS

The mean energy values in kcal, of the nutritional therapy
applied intravenously and via oral route in 186 patients
with moderate intoxications are presented on Fig. 1.

Fig. 1. Values of the energy requirements and energy
intake in kcal via oral and venous route in patients with
moderate intoxications

Fig. 2 demonstrates the mean energy values in kcal applied
as a nutritional therapy intravenously and via oral route in
48 patients with severe intoxications.

Fig. 2. Values of the energy requirements and energy
intake in kcal via oral and venous route in patients with
severe intoxications

Our data show that Biostim LBS covers a mean energy
value of 45.36% of the food applied orally in the group of
patients with moderate and of 70.86% in the group with se-
vere intoxications.

DISCUSSION

An optimal nutrition should meet not only energy require-
ments. By means of adequate import of macro-

microelements and vitamins it should ensure the fulfillment of
the complex vital processes in the body such as oxidation,
degradation, synthesis of new substances and hormones,
thermoregulation, etc. That is the reason why, for faster pa-
tients' recovery, special attention should be paid to the optimal
nutrition. Milk fermentation by Lactobacillus bulgaricus (L.
bulgaricus) strains contributes to a faster going-off of the me-
tabolic processes, to get higher quantities of free amino acids,
di-, tri-, and polypeptides, and as a consequence, an easier milk
protein absorption by human organism.

Table 1. Basic characteristics of the products from
Biostim LBS (Biomilk) series.

<table>
<thead>
<tr>
<th>INGREDIENTS /100g dry product</th>
<th>BIOSTIM LBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>6%</td>
</tr>
<tr>
<td>Dry ingredients</td>
<td>94%</td>
</tr>
<tr>
<td>Total proteins</td>
<td>23-27%</td>
</tr>
<tr>
<td>Soluble proteins</td>
<td>7-9%</td>
</tr>
<tr>
<td>Fats</td>
<td>16-20%</td>
</tr>
<tr>
<td>Total carbohydrates</td>
<td>52-57%</td>
</tr>
<tr>
<td>incl. lactose</td>
<td>0-4%</td>
</tr>
<tr>
<td>Galactose</td>
<td>13-15.5%</td>
</tr>
<tr>
<td>Glucose</td>
<td>13-15.5%</td>
</tr>
<tr>
<td>Saccharose</td>
<td>13-16%</td>
</tr>
<tr>
<td>Energy value</td>
<td>450 kcal</td>
</tr>
<tr>
<td>Pectin</td>
<td>0.9%</td>
</tr>
<tr>
<td>Minerals</td>
<td>&lt; 6%</td>
</tr>
<tr>
<td>Calcium</td>
<td>1000 mg</td>
</tr>
<tr>
<td>Potassium</td>
<td>&gt; 1500 mg</td>
</tr>
<tr>
<td>Iron</td>
<td>0.8 mg</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>780 mg</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>0.20 mg</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>122 mg</td>
</tr>
<tr>
<td>Vitamin B1</td>
<td>0.23 mg</td>
</tr>
<tr>
<td>Vitamin B2</td>
<td>1.54 mg</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>2.0 mg</td>
</tr>
<tr>
<td>Carotene</td>
<td>0.25 mg</td>
</tr>
<tr>
<td>Viable LBB cells</td>
<td>&gt; 1010</td>
</tr>
</tbody>
</table>

One of the basic contemporary components reflecting the
correct approach to the patients with intoxication is the
maintenance of the protein balance and energy needs. In the
probiotic Biostim LBS, the proportion of proteins:fats:car-
bohydrates is 1:0.7:1.8. This is in accordance with WHO
recommendations (i. e., 1:1.2).
In our study, the patients with moderate intoxications were given 125 g Biostim LBS daily, which provided 565 kcal/day, while those with severe intoxications received 250 g Biostim LBD daily, which provided 1130 kcal/day. In the patients from both groups, we observed an improved absorption of the nutrients via enteral route. This is evident from the increased energy intake via that route during the hospital stay. Biostim LBS provided as a mean oral energy intake of 45.36% in the group of patients with moderate intoxication and of 70.86% in the group with severe intoxication. These results were achieved owing to the correct choice of therapy that included mutually additive enteral and parenteral medications. In none of the patients adverse effects were observed at all concerning the parenteral medications and the enterally introduced Biostim LBS as well. They exerted a beneficial effect on the metabolism, improved the energy levels of the body and contributed to the absorption of the energy and the proteins. A special attention should be paid to the probiotic properties of the viable cells of L. bulgaricus, which favorably influence on the organism of the patients by improvement and regulation of the internal bacterial equilibrium (3,14). Their efficacy in increasing the resistance to internal pathogenic flora, in modulating the immune system, in protecting the antigen translocation in the blood flow, as well as their favourable influence on the hepatic encephalopathy is well known (13-15).

CONCLUSION

In conclusion, it should be emphasized that the correct choice of enteral and parenteral therapy ensures the maximally beneficial effect of the probiotic Biostim LBS for the patients with intoxications.

REFERENCES


