Compositional food and personalized diets in prevention of human chronic noncomunnicative diseases. By V. Bati and N. Boyko. *Uzhhorod National University, R&D Division of Microbiology and Mucosal Immunology Faculty of Medicine, Uzhhorod, Ukraine*

Foods of plant origin are the source of probiotics and bioactive substances content of which is determined by conditions of cultivating environment and food processing. Within the BaSeFood project[1] the preliminary study of the Black Sea region countries traditional foods of plant origin and their beneficial impact on human health had been conducted. We had demonstrated that edible plants as foods ingredients possesses selective ability to influence on key representatives of gut microbiota of experimental animals [1] and potentially can be applied for the regulation of the host metabolic balance [2]. Individual indicators (biomarkers) connected with initiated inflammation were detected for the three groups of patients with diagnosed obesity, diabetes type 2 and CVD [3].

Materials and Methods

We constructed foods from prebiotic and probiotic components both based on natural polymers, raw plants material and selected microorganisms to be then further tested in preclinical and clinical intervention studies as models of personified nutrition for the prevention and treatment of chronic human noncommunicative diseases. For this purpose we have selected only edible plants and compositions of microorganisms with already proved anti-inflammatory properties [4], which can predictively modulate local immune response and alter the gut microbiota on diet-specific manner [5]. Nine experimental diets samples based on different plants pectin, lignin, extracts of vegetables and berries accomplished with targeted microorganisms were developed. Ten groups of rats formed five individuals in each were formed and all the experimental foods samples vs. control diet were implemented orally to each animal separately on a daily regular basis during 12 weeks. The biochemical and microbial biomarkers were determined before and after diet treatment individually by using of relevant methods and techniques [6, 7].

Results and Discussions

We have found in experiments *in vitro* that compositional foods on strictly specific manner stimulate beneficial bacterial strains and inhibit growth of potentially pathogenic bacteria. Implemented diets led to decrease of rats' body weight differently in all the experimental groups except of control where typical animal feeding were used and opposite tendency to increase the mass was observed. Low density lipids (LDL) levels were decreased only in groups fed by plants pectin, lignin, bacterial cocktail, sauerkraut extraction while the diets consisting of yoghurt as matrix of different plants caused the increasing of the LDL still less in comparison with the animals from control group (up to 2.5 times during the experiment). Total lipids' content was significantly diminished in animals consuming diets based on yoghurt, vegetables, berries extracts and bacterial cocktail; we also observed specifically decreased content of triglycerides in rats fed by plants pectin. Total lipids content in the control group was also increased. Tested diets caused also the decreasing of cholesterol level in all experimental groups of animals but not in control group.

Plant based diets led to declination of amount of *Enterococcus faecalis* and *Staphylococcus spp.* in feces in comparison with control group. Concentration of *Klebsiella pneumoniae* and *Morganella morganii* significantly decreased only when diet contains extracts from blueberry. Levels of *Bacillus subtilis* are only slightly affected by oral administration of plants' pectin and lignin. The beneficial microbes presented mainly by lactobacilli but not bifidobacteria were persistently high in the fecal samples of all the

experimental groups of rats and accompanied with statistically significant differences in concentration of opportunistic microorganisms vs. to the animals from the control group.

Conclusion

Obtained data are the first evidence of long term preclinical study for the important inasmuch as afford opportunities to develop new generation of functional products – personalized foods that are able to regulate gut microbiota and to prevent not only infectious but also diet-related somatic diseases. Then the urgent task of modern food technologies became the highest possible preservation of all the beneficial properties of raw and ready-to-eat foods. And in medical practice if the key indicators single microorganisms and/or their associations as one part of complex biomarkers for a particular disease are know their recovery can be specifically guaranteed at the initial stage.

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