EJONS International Journal on Mathematic, Engineering and Natural Sciences | ISSN 2602 - 4136

Article Arrival Date	Article Type	Article Published Date
27.04.2023	Research Article	20.06.2023

THE EFFECT OF PROBIOTIC USE ON VITAMIN D LEVELS IN OBESE CHILDREN AND ADOLESCENTS WITH VITAMIN D DEFICIENCY

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INTRODUCTION

According to the World Health Organization, probiotics are digestible, nonpathogenic, live microorganisms when ingested in adequate amounts as dietary components can have a beneficial effect on the host by inhibiting or treating disease (9)

Obesity is defined as excess body fat and is a major health problem worldwide. The association between vitamin D deficiency and obesity and obesity-related diseases has been confirmed by a large number of studies, but the causal relationship is still unclear.

Several studies have shown that the gut microbiota alters vitamin D metabolism in the gut and that probiotic supplementation may affect vitamin D levels in the blood (1-6).

In this study, it was aimed to investigate the effects of adding probiotic replacement therapy to vitamin D replacement therapy on vitamin D status in obese children and adolescents with vitamin D deficiency. (1-6).

MATERIAL/METHODS AND RESULTS

After detailed history, anthropometric evaluation and physical examination, biochemical and vitamin D values of 42 obese patients aged 2-18 years who applied to the Pediatric Endocrinology Outpatient Clinic were investigated. Obese patients aged 2-18 years with vitamin D deficiency (25OHD level; 12-20ng/ml and no increase in PTH) were divided into two groups with similar demographic characteristics. One group received vitamin D treatment (Group 1; n: 21 cases), and the other group received oral probiotics containing 100 million active lyophilized Lactobacillus reuteri cultures in addition to vitamin D treatment (Group 2; n: 23). After 3 months of treatment, vitamin D and bone parameter levels of both groups were statistically compared.

Table1. Anthropometric data of Group 1 and Group 2

	Group 1	Group 2
Age	10.89 +/-3.9	10,61+/-4,08
BMI	29 +/- 2,64	24,6+/- 2,5
BMIP	97,19+/- 1,72	97,9+/-1,83

treatment			
Group 2	23	14,20+/-3,69	30,69+/-4,97
Group 1	21	13,77+/-3,47	21,66+/-3,15

When oral probiotics containing 100 million active lyophilized Lactobacillus reuteri cultures are given in addition to vitamin D replacement in obese patients aged 2-18 years with vitamin D deficiency; Statistically higher vitamin D values were found compared to the group given only vitamin D.

DISCUSSION

Probiotics are known to improve the balance of the gut microbiota by modulating microbes components and metabolites. They stimulate the immune system and balance commensal and pathogenic bacteria to reduce the incidence of infection, relieve symptoms, restore homeostasis, and alter toxic compounds and host products. Oral administration of probiotics alone or together with prebiotics can modulate the colonic microbiota, maintain the homeostasis of the intestinal environment, and protect the host from preneoplastic or neoplastic lesions (9)

Vitamin D is essential for maintaining bone tissue and homeostasis of the minerals calcium and phosphorus. Its receptors are found throughout the body and have multiple functions. Several factors can reduce vitamin D absorption, including limited sun exposure, dark skin, obesity, and problems with absorption or the ability to convert vitamin D to its active form. Vitamin D status linked to gut composition and function microbiome (9).

The active vitamin D metabolite 1α,25-dihydroxyvitamin D3 (1,25(OH)2D3) plays an important regulatory role in the gut through endocrine and possibly endocrine, autocrine and paracrine mechanisms. By activating the vitamin D receptor (VDR), which is highly expressed in the small intestine and colon, 1,25(OH)2D3 can regulate many genes that control gut physiology and homeostasis. 1,25(OH)2D3 is primarily responsible for epithelial barrier function and calcium and phosphate uptake, as well as host defense against pathogens and inflammatory responses of various types of secretory and immune cells.

There are reciprocal and unclear interactions between vitamin D and normal and pathological microbiota. Vitamin D not only modulates the immune response to the microbiota, but also alters the gut microbiota (dysbiosis); this is a host-mediated effect because bacteria lack VDR. In mice, vitamin D deficiency at birth led to reduced colonic populations of Bacteroides and Prevotella species later in life. Bacterial levels of Firmicutes strains were reduced and levels of Bacteroides and Proteobacteria strains were increased in feces of Vdr-deficient mice, and changes in several members of bacterial genera. Data on humans is very scarce. In a double-blind, placebo-controlled study, Oral administration of the probiotic Lactobacillus reuteri NCIMB 30242 increased circulating levels of 25(OH)D compared to placebo in a randomized, parallel, multicenter study. Data on humans is very scarce. In a double-blind, placebo-controlled study, Oral administration of the probiotic Lactobacillus reuteri NCIMB 30242 increased circulating levels of 25(OH)D compared to placebo in a randomized, parallel, multicenter study

The intestinal microbiota plays an important role in many metabolic functions, such as modulation of glucose and lipid homeostasis. It provides regulation of various biochemical and physiological mechanisms in the body. Lipopolysaccharides of pathogenic microorganisms, which increase in obesity, cause endothelial damage, leading to an increase in endotoxemia and inflammatory cytokines (5). In this way, leaky gut problem arises and absorption from

enterocytes is impaired. This suggests that dysbiosis may be effective in increasing vitamin D deficiency in obese patients. On the other hand, it is known that the intestinal microbiota has an effect on the vitamin D level and vitamin D receptor level, as well as the vitamin D levels has an effect on the intestinal microbiota. (3,4,5,8). All of these make it difficult to reach optimal vitamin D levels when vitamin D deficiency is detected in obese patients and requires a long and resistant treatment period.

CONCLUSION

Adding probiotic replacement to vitamin D replacement therapy can improve vitamin D status in obesity

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