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Berseem (Trifolium Alexandrium) Leaves in Diet as Immuno-Nutrient; Cytokine and T-Cell Subpopulation Responses in Malnutrition

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Editorial

National Health Survey (India), in 2005 to 2006 showed that 46% Children <3 yr of age are undernourished; of these 2.8% are having severe acute malnutrition, who will be needing hospital care. The baseline cytokine levels are high in malnourished children; therefore, correction of malnutrition should lead to prompt reversal of acquired immune dysfunctions. This initiated us to study green leaves of Berseem (Trifolium alexandrium), with high protein content of 18% to 23% concentrated in powder form (prepared by ultra filtration and acid thermo coagulation); LPC-100 g contained- 344 calories; fat 22.5 g, CHO 12.5 g, fibre 1 g, β -carotene 86700 μ g, vitamin B complex- B1 0.5 mg, B2 0.5 mg, B5 24.2 mg, B6 1 mg, B9 330 mg, pantothenic acid 4.3 mg, vitamin C 2.2 mg, vitamin K 1 mg, Ca²⁺ 187 mg, P³⁺ 604 mg, Fe²⁺ 99 mg, Zn²⁺ 9 mg, Mg²⁺ 384 mg, Cu²⁺ 2.1 mg and K⁺ 713 mg). Curd was set in the hospital kitchen using the starter provided by National Dairy Research Institute, Karnal. 1 g of curd contained 108 Colony-Forming Units (CFU), each of Lactobacillus bulgaricus and Streptococcus thermophilus. Curd (100 g contains- energy 60 cal, protein 3.1 g, fat 4 g, CHO 3 g, β-carotene 102 μg, B1 0.05 mg, B2 0.16 mg, B5 0.1 mg, B9 12.5 μg, vitamin C 1 mg, Ca²⁺ 149 mg, P³⁺ 93 mg, Fe²⁺ 0.2 mg, K⁺ 130 mg, Na⁺ 32 mg) was supplied to the subjects under refrigerated conditions. Study was conducted in hospitalized malnourished children (mean age 24.9 ± 11 months); 36 patients Consumed the Leaf Powder (LPC) and in the other group for comparison 32 patients received fermented milk 200 g of curd was provided in two containers of 100 g each, both groups received 6 g protein from Berseem or curd in the recommended WHO diet for 15 days. Parents of the enrolled children were advised to refrain from giving any other food or micronutrient supplements. Cytokines levels (TNFα, IFNγ, IL-10, IL-4) were estimated using protocol by Genzyme Cambridge Mass. USA and for T-cell subpopulations (CD4, CD8, CD4/CD8), the fluorescent automated cell sorter technique, was used (Table 1). An increase in serum proinflammatory (TNF α , IFN γ), and anti-inflammatory (IL-10) and a fall in IL-4 levels was observed. There was an increase in CD4: CD8 ratio after treatment in both the groups. Berseem leaves in malnutrition showed comparatively better proinflammatory response and reduction in IL-4 as compared to fermented milk, which showed higher increase of IL-10. Leaf protein offers good and cheap source of protein with immuno-modulating properties to control malnutrition in developing countries. Those preparing, children's food and for mothers in developing countries could use Berseen leaves protein to add extra protein with vitamins and minerals.

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 Table 1: Clinical significance-LPC group has performed better than FM group, excepting IL-10.

| Groups/parameters | TNFα | IFNγ | IL-4 | IL-10 | CD4/CD8 ratio |
|---|------|------|-------|-------|---------------|
| Leaf protein (LPC) % change -32 patients | 90.2 | 36.1 | -66.9 | 7.81 | 26 |
| Fermented milk (FM) % change -36 patients | 38.5 | 31.9 | -23.2 | 117.6 | 20.8 |

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References

- Agarwal KN, Bhasin SK. Feasibility studies to control acute diarrhoea in children by feeding fermented milk preparations Actimel and Indian Dahi. Eur J Clin Nutr. 2002;56(1-4):556-9.
- Dewan P, Kaur I, Chattopadhya D, Faridi MM, Agarwal KN. A pilot study on the effects of curd (dahi) & leaf protein concentrate in children with Protein Energy Malnutrition (PEM). Indian J Med Res. 2007;126:199-203.

- Dewan P, Kaur I, Chattopadhya D, Faridi MM, Agarwal KN. Cytokine response to dietary rehabilitation with curd (Indian dahi) & leaf protein concentrate in malnourished children. Indian J Med Res. 2009;130:31-6.
- 4. Agarwal KN. Indian dahi as immunonutrient- a pilot study. Acta Scientific Paediatrics. 2018;1(1):2-4.