

Effect of a double-coated probiotic formulation on functional constipation in the elderly: a randomized, double blind, controlled study

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Abstract A randomized, double blind, controlled study was conducted to evaluate a multi-species probiotic product, Duolac[®] Care, for the efficacy in functional constipation of elderly nursing home residents. Forty participants were randomly assigned to receive either one capsule containing six bacterial strains (2.5×10^8 viable cells/capsule) doubly coated with proteins and polysaccharides (DC group) or one capsule containing the same bacterial strains without the coating layers outside the cell (NC group) twice a day (5×10^8 viable cells/day). After consumption of 2 weeks, NC group showed a significant improvement in a symptom of Rome III criteria for constipation, ‘effort to evacuate’, but failed to show a significant improvement in weekly defecation frequency. By contrast, DC group showed significant improvements in symptoms of ‘effort to evacuate’ and ‘sensation of anorectal obstruction or blockage’ as well as being improved in ‘defecation frequency’. The quantitative analysis of the fecal bacteria revealed that the levels of all the bacterial species consumed were significantly increased after consumption in both groups. However DC group showed larger increases in the bacterial levels than NC group, and the overall bacterial levels in DC group were about 100-fold or greater than those in NC group. Therefore the improvements in the symptoms appeared to be closely associated with large increases of the bacterial species consumed. The

double-coating layers of proteins and polysaccharides ensured increase in the levels of bacteria, indicating that the layers function to protect the bacteria from the digestive action in the GI tract. Therefore, Duolac[®] Care could be a treatment option in functional constipation.

Keywords Probiotics · Functional constipation · Double-coated bacteria · Non-coated bacteria · Defecation frequency

Introduction

Constipation is a common digestive complaint, characterized by straining during defecation, lumpy or hard stools, sensation of incomplete evacuation or anorectal obstruction, manual maneuvers to facilitate defecation, and/or less than three defecations per week (Longstreth et al. 2006). It is prevalent among people of all ages and both sexes, but its occurrence increases with age. It was reported that constipation has affected about 26 % of men and 34 % of women over 65 years of age but less than 2 % of the non-elderly people (Johanson et al. 1989; Whitehead et al. 1989). In particular, at least 75 % of elderly hospitalized patients and nursing home residents are known to suffer from constipation (Primrose et al. 1987). Possible factors for the development of functional constipation in the elderly include dietary changes, increased intestinal transit times, lack of physical activity, and frequent use of medications.

Probiotics are defined as live microorganisms which when administered in adequate amounts confer a health benefit on the host (FAO/WHO 2001). Their beneficial roles in many gastrointestinal disorders such as irritable bowel syndrome (IBS) (Hoveyda et al. 2009),

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