Non-digestible Polysaccharides and Intestinal Barrier Function
- specific focus on its efficacy in elderly and patients with Crohn's disease

av

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Akademisk avhandling

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Abstract


A large number of elderly suffer from gastrointestinal (GI) symptoms such as constipation and diarrhoea. The underlying mechanisms of age-acquired GI symptoms are not well studied but are necessary to clarify in order to recommend the right treatment. Non-digestible polysaccharides (NPS) are dietary fibres that could have beneficial effects on the intestinal immune system and barrier function, although their efficacy needs to be evaluated. Paper I showed that elderly with GI symptoms have significantly higher small intestinal permeability than a general elderly population, along with a stronger association to psychological distress. In Paper II we performed a randomised controlled trial with a general population of elderly that consumed either placebo, the NPS’s arabinoxylan or oat β-glucan for a period of 6 weeks. No protective effects were observed related to indomethacin-induced intestinal hyperpermeability, inflammatory markers, or self-reported health if compared to placebo. Paper III showed that stimulation with a yeast-derived β-glucan significantly attenuated Compound (C) 48/80-induced hyperpermeability in colonic biopsies from elderly with GI symptoms mounted in Ussing chambers, but not in young healthy adults. Arabinoxylan attenuated only C48/80-induced transcellular permeability in elderly but both paracellular and transcellular permeability in young healthy adults. Paper IV showed that the same yeast-derived β-glucan from paper III could cross the epithelium of ileal tissues from patients with Crohn’s disease (CD) and non-CD controls, mounted in Ussing chambers, and attenuate C48/80-induced hyperpermeability. In conclusion, we found that elderly with GI symptoms display a deteriorated barrier function and that administration of selective NPS can have beneficial effect on intestinal permeability in selective populations.

Keywords: non-digestible polysaccharides, beta-glucan, arabinoxylan, barrier function, permeability, Ussing chamber, elderly, Crohn’s disease

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