A lupin protein hydrolysate reduces the severity of a preclinical mouse model of multiple sclerosis.

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Multiple sclerosis (MS) is a degenerative disease of the central nervous system (CNS) caused by various factors, principally inflammation and oxidative stress. While several drugs alleviate MS symptoms, none provide a cure for it. Recent research has revealed that certain proteins found in food contain encrypted peptides that, when released through a hydrolysis process, exhibit numerous biological activities. We have recently demonstrated that a lupin protein hydrolysate (LPH) generated with the Alcalase enzyme exerts antioxidant and anti-inflammatory activities in both *in vitro* and *in vivo* models. Therefore, the objective of this study was to investigate whether LPH could reduce the clinical signs of experimental autoimmune encephalomyelitis (EAE), a mouse model of MS. EAE was induced in female C57BL/6N mice by immunization with the myelin oligodendrocyte glycoprotein (MOG_{35-55}) in a complete Freund adjuvant plus Pertussis toxin. Mice were orally treated with LPH (100 mg/kg) or vehicle (control group) before disease onset (prophylactic approach) or from the onset (day 12 post-induction) of symptoms (therapeutic approach). The clinical score of each mouse was recorded daily. Prophylactic treatment with LPH reduced the clinical score, the maximum score, and the cumulative score compared to the control group, but did not alter the onset of symptoms. However, the therapeutic intervention did not improve the severity of the disease. These findings indicate that lupin biopeptides can reduce the severity of MS when used preventively, suggesting their potential as new nutraceuticals or functional foods. Nevertheless, further studies are required to confirm this promising effect.