

Pistacia Resin as a Potential Preventative Therapy for Alzheimer's Disease



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Mini Review

Alzheimer's disease (AD) is a progressive neurodegenerative disease. Today, Alzheimer's disease is known to almost everyone. The rise of life expectancy has increased the Alzheimer's risk factor and all efforts for finding a cure have been exhausted. AD is the most common neurological degenerative disease in people over 65 years of age. It is a form of dementia with a gradual onset, usually beginning with symptoms of impaired short-term memory and impaired cognitive function, accompanied by mood changes. Dementia may occasionally be difficult to distinguish from normal ageing [1], however, it is a pathological process.

Helicobacter pylorus (*H. pylori*) is one of the most significant discoveries in gastroenterology in the past century. It is associated with a wide range of gastroduodenal pathology, gastric cancer and non-gastric diseases; AD, Parkinson's disease, atherosclerosis, and cardiovascular ischemia [2-4]. *H. pylori* are not the only risk factor for AD. Infectious agents in general have been proposed as potential causes of AD [5]. This makes Mastic gum and other tested gum by the author [6], including *Araucaria heterophylla* (Sharifi unpublished data), a good candidate for preventing AD. The said gum has demonstrated anti-microbial activities against various Gram-positive and Gram-negative human pathogen [7]. A high prevalence of *H. pylori* infection has been documented in patients with AD [6]. The effect of *H. Pylori* eradication on the AD cognitive (MMSE: Mini Mental State Examination and CAMCOG: Cambridge Cognitive Examination for the Elderly) and functional (FRSSD: Functional Rating Scale for Symptoms of Dementia) status parameters in patients were assessed. A total of 50 patients with AD and 30 age-matched anaemic controls underwent an upper gastrointestinal endoscopy. Gastric mucosal biopsies were also obtained to detect the presence of *H. Pylori* infection by histologic analysis and rapid urease test. The serum anti-*H. Pylori*-specific IgG level was also analysed by enzyme-linked immunosorbent assay. The *H. pylori* positive patients with AD were treated with triple eradication regimen. All patients were followed up

for 2 years while receiving cholinesterase inhibitors. Cognitive and functional status parameters improved in the subgroup of patients where *H.pylori* eradication was successful ($P<0.001$ and $P=0.049$ for MMSE and CAMCOG, respectively; $P<0.001$ for FRSSD). Cognitive and functional status parameters remained unchanged in patients where the eradication did not succeed.

H. pylori eradication may positively influence AD manifestations, suggesting a link between AD and *H. pylori* infection. Antibiotic resistance in *H. pylori* has emerged as a significant clinical problem. Furthermore, contemporary therapy is expensive and complex, this presents problems particularly for people with low socioeconomic status. In this review we suggest an alternative therapy based on observations of traditional medicine for gastric diseases in the Mediterranean. This traditional therapy centres on the trunk exudates of *Pistacia* genus trees.

Extensive studies have been carried out to determine antimicrobial activities of trunk exudates from the genus *Pistacia*, in particular *Pistacia lentiscus* (Mastic Gum). Mastic gum is a viscous light-green liquid obtained from the bark of *Pistacia lentiscus* which belongs to the Anacardiaceae family. The gum has been fractionated to investigate the antimicrobial activity of the whole gum and its fractions against various strains of *H. pylori*.

The chemical entities of Mastic, Kurdica, Mutica and Cabolica gums from the genus *Pistacia* have been isolated and characterised by GC-Mass Spectrometry, High Performance Liquid Chromatography and Column Chromatography [8]. These chemical entities were screened for anti-microbial activities against nine strains of *H. pylori* and some other Gram-negative and Gram-positive bacteria. The most bioactive components were structurally analysed. These components mimic steroid compounds, in particular, the known antibiotic Fusidic acid [9]. Some of these chemical entities have produced promising

data that could lead to the development of a novel class of antimicrobial agents that may have application in the treatment of infectious disease.

Kill kinetics have been also performed, and the produced data were evaluated by Generalized Multiplicative Analysis Of Variance (GEMANOVA) for the bactericidal and bacteriostatic activities which can be clinically significant. The isolated components were all bactericidal [10].

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