Concern for adverse effects of huperzine a when sold as an ingredient in food supplements

Huperzine A is marketed as a cognitive enhancer for healthy individuals when sold as an ingredient in food supplements. Huperzine A is, however, an acetylcholinesterase (AChE) inhibitor with potential for serious adverse health effects if administered in the doses recommended for food supplement use (up to 900 μg/d). Huperzine A acts by inhibiting AChE, thus preventing the degradation of endogenous acetylcholine, which leads to disrupted neurotransmission that may result in a variety of symptoms such as salivation, defecation, muscle fasciculation, convulsions and death. Purpose: The aim of this study was to make a risk assessment of huperzine A from food supplements based on the available literature.

Method: A systematic review of the literature covering the bibliographic databases SciFinder®, PubMed and Web of Science™ was performed to search for toxicological data on huperzine A. Results: Very few toxicological studies were identified in the literature search. However, several articles cite a series of unpublished studies submitted to the FDA as part of an investigational new drug submission. The study information is sparse and only provides the species, dose range, duration and a short summary of end-points. None of the studies are longer than 180-days. The observed adverse effects can all be related to AChE inhibition but due to the limited information none of the studies are suitable for establishing a health-based guidance value such as an Acute Reference Dose (ARfD) or Acceptable Daily Intake (ADI). One study in humans showed that administration of 200 μg huperzine A resulted in an erythrocyte AChE-inhibiting activity >20% for almost 5 hours post-dose. A specific cut off value of 20% for brain or erythrocyte AChE inhibition is considered to differentiate between adverse and non-adverse effects. Huperzine A is under investigation for use as a drug for Alzheimer's disease. Adverse effects like diarrhoea, nausea and vomiting have been reported in these studies, where the investigated doses generally are half the highest dose recommended by vendors of food supplements. Whereas, a certain degree of side effects is accepted for drugs, the same effects should be unacceptable from food supplements intended for healthy individuals.