Proc. Nutr. Soc. Aust. (1979) 4:141

TYRAMINE AND OTHER VASOACTIVE AMINES IN FOOD

D.R. BRIGGS* AND KAREN A. PARGETER*

Some migraine sufferers have claimed that the ingestion of certain foods act as a trigger factor in the onset of their headaches. The evidence of food provocation in the aetiology of migraine is largely presumptive and relies on the sufferer to identify the relationship between the ingested food and the onset of headache. The precise role of the food in the induction of migraine is not known. Hannington (1967) noticed that the foods most commonly implicated in migraine, namely alcoholic drinks, cheese, chocolate, citrus fruit and milk products, were also reported to produce migraine-like headache in some patients receiving monoamine oxidase inhibitor therapy. These headaches were shown to be due to the ingestion of tyramine-containing foods.

Investigations to determine the role of tyramine and tyramine-containing foods in migraine have produced inconsistent results (Hannington et al., 1970; Medina and Diamond, 1978). These inconsistencies may be due to very low levels or the absence of tyramine and/or related vasoactive amines in the foods used in these studies. For example, the tyramine content of cheese shows great variation, not only between varieties but also within the same variety, and chocolate has shown varying levels of phenethylamine and tyramine (Schweitzer et al., 1975; Ingles et al., 1978).

Initially, we wished to develop an analytical methodology which would allow the simultaneous determination of tyramine and related compounds in food. These amine-containing foods will be used as a dietary challenge in patients clinically diagnosed as suffering from migraine. This work is part of an investigation into the role of diet as an aetiological factor in the onset of migraine headache.

High-pressure liquid chromatography combined with ion pair partition was used to measure tyramine, phenethylamine and related amines in food samples. The sample was homogenized with perchloric acid, filtered, adjusted to pH 6.0 and then adsorbed on a Dowex 50W-X2 cation-exchange resin (Bio-Rad Laboratories). Elution was carried out using 4N hydrochloric acid, the extract adjusted to pH 5.0 and the amines resolved using a reversed-phase μ Bondapak C_{18} column (Water Associates) with methanol : water (2:3) containing PIC B-8 reagent (Water Associates) as counter-ion. The amines were detected and quantitated by UV absorbance using dual cells set at 254 and 280 nm. Recoveries were estimated using samples spiked with amine standards.

HANNINGTON, E. (1967). Brit. Med. J. 2 : 550

HANNINGTON, E., HORN, M., and WILKINSON, M., (1970). 'Background to Migraine', Heinneman : London, pp 113-119.

INGLES, D.L., TINDALE, C.R., and GALLIMORE, D. (1978). Chem. Ind. 432.

MEDINA, J.L., and DIAMOND, S. (1978). Headache 18 : 31.

SCHWEITZER, J.W., FRIEDHOFF, A.J., and SCHWARTZ, R. (1975). Nature 257 : 256.

*Section of Human Nutrition,
Deakin University, Geelong, Victoria. 3217