EDITORIAL

A SYMBIOTIC INTERACTION BETWEEN PHARMACOLOGY AND NUTRITION

An article appearing in this issue of the journal raises important points regarding the relationship between pharmacology and nutrition. It is common knowledge that in the management of diabetes and hypertension, dietary control is just as important as the use of drugs. Indeed, dietary control alone may be adequate for management of type II diabetes. In pregnancy where there is increased demand for certain vitamins and minerals, it is possible to meet these requirements through nutrition rather than administration of drugs such as folic acid and ferrous salts. In the elderly it is possible to minimise excessive medication by paying attention to their nutritional needs.

There are other areas where the pharmacology - nutrition interface is not so obvious. One such area is the interaction between nutrients and drugs. These interactions can be classified as either pharmacokinetic or pharmacodynamic. Pharmacokinetic interactions occur at the level of absorption, distribution, metabolism and excretion while pharmacodynamic interactions involve drug receptors.

Food intake may promote drug absorption by slowing gastric emptying and hence increase gastrointestinal (GI) tract transit time thus allowing more complete dissolution or prolonged residence. Examples include diazepam, griseofulvin, nitrofurantoin and riboflavin. Certain foods may also enhance drug absorption by promoting gastric blood flow. Liquid paraffin, commonly used as a lubricant/softener, may interfere with absorption of essential fat soluble substances such as vitamin K. Chronic alcoholism causes thiamine malabsorption which then leads to alcoholic polyneuritis with motor and sensory defects. Yet another complication of thiamine deficiency is Wernicke-Korsakoff syndrome characterised by impairment of retentive memory and inability to acquire new information. Milk interferes with absorption of tetracycline from GIT.

Fasting may affect drug disposition. Levels of fatty acids rise dramatically following fasting. The fatty acids bind to the albumins and often displace bound drugs such as warfarin, diazepam and phenytoin. The displaced drug is available for both metabolism and renal elimination.

Drug-nutrient interaction at the level of metabolism is common. Ingestion of cheese, wine, beer, preserved meat and fish products by patients on monoamine oxidase (MAO) inhibitors may lead to nervous symptoms. Inhibition of MAO enzyme means that tyramine, a sympathomimetic found in these foods, is not metabolised, hence the observed symptoms. Serotonin, a neurotransmitter in the brain is also metabolised by MAO enzyme. Serotonin is present in such foods as bananas and pineapples. Ingestion of MAO inhibitors together with bananas, cheese etc may lead to a multiplicity of nervous symptoms characterised by bizarre dreams or nightmares. Isoniazid, a tuberculostatic drug is a MAO inhibitor. TB patients on this drug may show elevated mood after eating cheese.

The renal clearance of such drugs as digoxin and gentamycin is a function of glomerular filtration. The latter is greatly modified by ingestion of large fluids. Similarly, caffeine, the active constituent of tea and coffee causes a transient increase in renal blood and glomerular filtration rate and hence promote elimination of certain drugs. Urinary excretion of drugs is greatly influenced by pH of urine which in turn is influenced by the type of food ingested.

Pharmacodynamic interactions between drugs and nutrients are rare. A good example is the drug-induced folic acid deficiency leading to megaloblastic anaemia. Subacute myelo-optic neuropathy observed among Japanese, treated with clioquinol in the 1 960s was probably due to food-drug interaction.

The use of food supplements or "biotonics" should be of interest to both pharmacologists and nutritionists. Food supplements are exempted from the requirements specified for drug registration purposes. No proof of efficacy supported by research data is needed. These products contain vitamins, minerals, trace elements, amino acids and occasionally plant extracts. The use of "biotonics' is widespread in USA, Canada, Britain and many European countries. It is also catching up in Kenya and many other African countries. Both pharmacologists and nutritionists in Africa must look at these developments with apprehension as their usefulness is questionable, yet they constitute an unnecessary burden on our fragile economies.

Editor-in-Chief