european aluminium association

ALUMINIUM AND HEALTH

Fact sheet 2

ALUMINIUM IN THE BODY

It has been estimated that the average human body contains from 35 mg to 50 m*g* of aluminium, of which approximately 50% is in the lungs, 25% is in the soft tissues and 25% in bones. There is no known biological role for aluminium. - it does not appear to be an essential trace element - and the human body has effective barriers against aluminium uptake. Only a minimal fraction of aluminium in the diet is absorbed from the digestive tract and in healthy individuals most of this is very quickly excreted by the kidneys. When aluminium blood levels are very high, bones appear to act as a "sink", taking up aluminium and subsequently releasing it slowly over a long period. The brain is vulnerable to many chemical and biological agents but is protected by a “blood-brain barrier”- a collection of cells forming the inner lining of capillary blood vessels which prevent many substances from entering the brain.

To study aluminium in the body, researchers have fed human volunteers with more than 100 times the aluminium they ordinarily consume without any effects.
In the past animals have received even greater quantities and also under these circumstances practically all aluminium is carried through the digestive tract and eliminated.

Aluminium in the diet of an average adult usually ranges from about 3 mg per day to 10 mg per day, although people on special medication may receive more than 1000 mg per day, usually as aluminium hydroxide. Recent studies have shown that the absorption of aluminium from the digestive tracts may be as low as 0.01%, although up to about 0.1% can be absorbed when it is in the form of aluminium citrate. This does not make any difference to the excretion of aluminium.

There are abnormal situations when the barriers are being bypassed or are defective.
Patients with kidney failure face a multitude of problems, including the inability to excrete absorbed aluminium. The symptoms associated with exposure to aluminium in the dialysis fluid, and/or with the long-term medical use of aluminium compounds in this patient group are recognised. Care is taken to monitor blood levels of aluminium in anyone with kidney failure. The acute neurological disease described in the early days of renal dialysis has no connection with Alzheimer's Disease. Intravenous preparations for patients receiving regular intravenous treatment are today made without aluminium.

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