E
Possible Involvement of Aluminum Salts in Erythema Multiforme, Encephalopathy, or Other Adverse Events After Pertussis Immunization

DPT vaccine preparations regularly contain aluminum salts (aluminum hydroxide, aluminum potassium sulfate, or aluminum phosphate) that are intended to serve as adjuvants (British National Formulary, 1988; Physicians' Desk Reference, 1989). Orlans and Verbov (1982) suggested that DPT-associated rashes could be due to aluminum hydroxide. Other more significant local reactions including nodules at the site of injection, itching, eczema, and circumscribed hypertrichosis over nodules have been observed more frequently following administration of aluminum hydroxide-adsorbed DPT vaccine than after administration of unadsorbed DPT vaccine (Pembroke and Marten, 1979).

Interest has developed recently in the potential health effects of aluminum, particularly in the setting of chronic renal failure, in which aluminum is not excreted from the body normally (Alfrey, 1984; Monteagudo et al., 1989). A severe, often fatal encephalopathy found in patients undergoing long-term dialysis was attributed to aluminum deposition in the brain (Alfrey et al., 1976). Reduction of aluminum in dialysate has largely eliminated this condition, but dialysis patients may still have subtle psychomotor defects that may be due to aluminum toxicity (Altmann et al., 1989). Animal studies have shown that aluminum can increase the rate of transmembrane diffusion across the blood–brain barrier (Banks and Kastin, 1989), which could possibly permit greater access of toxins to the brain.

Patients receiving long-term injections of aluminum-containing allergenic