TREATMENT OF THYROID STORM IN A CHILD WITH DANTROLENE

Sir,—We would like to report a case of thyroid storm in a child in whom tachycardia and increasing temperature—despite maximal conventional treatment—was treated with dantrolene.

The patient, a 3½-year-old girl (weight 12 kg) was admitted to the pediatric department, where thyroid storm was diagnosed. The patient had goitre, exophthalmos and extremely increased thyroid function test values. X-ray examination of the chest revealed cardiac enlargement. The patient was treated with propylthiouracil and propranolol orally and sodium iodide i.v. for 5 days, and these normalized thyroid function. In spite of this treatment, recurrent episodes developed cardiac and ventilatory failure, and was transferred to the intensive care unit. Maintenance of adequate arterial oxygen tension was difficult even with artificial ventilation with positive end-expiratory pressure. Treatment with digoxin, frusemide, steroids and antibiotics was initiated. Tachycardia and hyperthermia persisted and the dose of propranolol was increased again, tachycardia continued and the condition of the patient deteriorated. Dantrolene sodium 10 mg was given i.v. once an hour for 3 h. This dosage was repeated 3 h later. Twelve hours after start of this treatment, the temperature had decreased from 39 °C to 34 °C, and the heart rate was reduced from 140 beat min⁻¹ to 90 beat min⁻¹. Concomitant with the decrease in temperature we measured a 30% decrease in VCO₂ measured with a carbon dioxide analyser (930: Siemens-Elema, Sweden). Dantrolene was continued for 24 days and a total of 180 mg was given. The temperature and heart rate were controlled thereafter with conventional therapy. The patient died 12 days later in irreversible ventilatory and renal failure.

Thyroid hormones increase protein and ribonucleic acid synthesis (Symons, 1979). The earliest action of thyroid hormones is to accelerate the basal respiratory rate (BRR) of the mitochondria. Dantrolene sodium, a drug efficacious in the treatment of acute malignant hyperthermia, prevents release of calcium from the sarcoplasmic reticulum (Britt, Scott and Frodis, 1984). The exact site of action of the drug is not known, even though it could be a direct effect on the sarcoplasmic reticulum, or indirect on the T-system or exitation—contraction coupling. Alternatively, dantrolene might alter some calcium-related function of mitochondria and, thereby, control BRR.

Fulminant heat stroke has been treated with dantrolene with excellent results (Lydiatt and Hill, 1981). The heat stroke syndrome and malignant hyperthermia have apparent relationships (Jardon, 1982), and the clinical symptoms of these syndromes have apparent similarities with those of thyroid storm (Stevens, 1983).

The present case report indicates that treatment with dantrolene sodium should not be reserved for cases of malignant hyperthermia, but might be considered in cases of thyroid storm, especially when other therapy fails.

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REFERENCES