Dystonia associated with carbamazepine toxicity

A. J. BRADBURY
D.C.H., M.R.C.P.

B. BENTICK
M.B., D.R.C.O.G.

P. J. TODD*
D.C.H., M.R.C.P.

Department of Child Health, Alder Hey Children's Hospital, Eaton Road, Liverpool L12 2AP, and *Royal
Liverpool Children's Hospital, Myrtle Street, Liverpool L7 7DG

Summary
An uncommonly reported toxic effect of carbamazepine is a dystonic reaction. We report two children
who developed dystonic reactions with toxic serum levels of carbamazepine.

Case reports
Case 1
An 11-year-old boy presented with a 1-year history
of attacks of unconsciousness lasting about 10 min.
There were no tonic or clonic movements. Some
attacks were phytically induced. An electroencephalogram was abnormal with excessive slow wave
activity over the left cerebral hemisphere. He was
treated with carbamazepine (5-7 mg/kg) twice daily.
One month later he presented with an 8-hr history of
diplopia, dizziness, fainting and stiffening of his
limbs. His level of consciousness was fluctuating and
he was having severe dystonic movements which
were exacerbated by disturbance. There was opisthotonic
posturing with extension of the limbs but
flexion of the wrists. Shortly after admission he had
a grand mal fit which was terminated after 5 min by
intravenous diazepam. His serum carbamazepine
level was 21 μg/ml on admission (therapeutic range
4-8 μg/ml). He subsequently admitted to taking
double his usual dose for the 2 days before admission.
He recovered spontaneously over a 12-hr period, the
dystonia lasting approximately 6 hr. His previous
dose of carbamazepine was continued and his most
recent serum level was 9.3 μg/ml.

Case 2
An 11-year-old girl presented following a number

of episodes of unconsciousness lasting several minutes.
There was a family history of epilepsy. An
electroencephalogram was abnormal with paroxysmal
sharp and slow wave activity more marked over the
right cerebral hemisphere. She was treated with
carbamazepine (5 mg/kg) twice daily. She presented
a year later following 2 convulsions. On admission
she was unconscious and hypotonic and on disturbance
was noted to have intermittent extension of all
her limbs. At times minor disturbance induced very
severe dystonic movements of the limbs with extent-
ion of the trunk and neck. Investigations including
blood electrolytes were normal except for a carbama-
zepine level on admission of 25 μg/ml. She received a
diazepam infusion and her symptoms resolved in 24
hr, the dystonia having been present for 17 hr. There
was no history of excessive medication or of ingestion
of other drugs. Her dose of carbamazepine was
reduced to 3.75 mg/kg twice daily and the most
recent blood level was 5 μg/ml.

Discussion
Carbamazepine is widely used in the treatment of
epilepsy and has also been used in the treatment of
dystonia. Reported side effects include ataxia, dizzi-
ness, drowsiness, diplopia, dry mouth, nausea, vomiting,
diarrhoea, rashes, blood dyscrasias and abnor-
mal liver function with prolonged treatment (Wade,
1977). Hyponatremia has been reported in a few
patients and acute overdose may lead to convulsions
(Bailey, 1981). Dystonic reactions rarely have been
reported. Crosley and Swender (1979) reported 3
cases of dystonia associated with carbamazepine
administration in brain-damaged children. Their
patients had received other drugs in addition to
carbamazepine.Jacome (1979) reported 4 cases of
dystonia associated with carbamazepine in adults
on treatment for epilepsy. In 3 cases the carbamazepine
was an addition to therapy and in the fourth the dose had recently been doubled. Lehrman and Bauman (1981) reported a case of deliberate carbamazepine poisoning in which opisthotonic posturing and abnormal movements were noted. These symptoms were controlled with physostigmine.

In both of our patients the dystonia was clearly associated with toxic serum levels of carbamazepine. In the first case the boy had taken an excessive amount of carbamazepine. In the second case it is not clear how the toxic level was achieved. The carbamazepine dosage was only 10 mg/kg/day and thus acute overdosage remains a possibility. In neither case was there a history of abuse of other drugs although it would have been interesting to take blood and urine from the patients on admission for toxicology screening. The dystonia appears to have been the result of toxic levels of carbamazepine since it rapidly disappeared after drug withdrawal and has not recurred in association with the current lower serum levels.

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References

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