identify potential markers for the development of agranulocytosis. Haematological side-effects include leucopenia, neutropenia and thrombocytopenia (1–3% of patients); and anaemia, leucocytosis and thrombocytosis (<1% of patients) (American Hospital Formulary Service, 1997). Thrombocytosis reported with clozapine treatment may give evidence of the mechanism of agranulocytosis in some patients.

In some cases clozapine is discontinued if the differential white blood cell count shows an initial drop with starting clozapine treatment. If a re-challenge on clozapine results in either thrombocytosis or thrombocytopenia, this may be a result of an immune reaction, as both these platelet abnormalities are recognised features of such a reaction. (Note that it is now recommended that permanent withdrawal of clozapine should occur for leucopenia below $3 \times 10^9$/l or neutrophil count below $1.5 \times 10^9$/l (British Medical Association & Royal Pharmaceutical Society of Great Britain, 2000)).

Clozapine has a direct action on the haematopoietic stem cells of the bone marrow and can therefore trigger a reaction similar to an acute myeloid leukaemia or myeloproliferative disorder. It is hypothesised that an abnormal haematocrit and platelet abnormality could be seen if clozapine caused these side-effects via an immune reaction on the haemopoietic tissue. Karyotype analysis provides useful prognostic information in myelodysplastic syndrome (Provan, 1997), and is associated with clozapine response (Arranz *et al*, 1995). A high index of suspicion when reviewing the full blood count or karyotype analysis could lead to a marker before fatal agranulocytosis occurs as a result of clozapine.

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## Etomidate-induced convulsion prior to electroconvulsive therapy

Choice of anaesthesia for electroconvulsive therapy (ECT) has become more limited in the past year owing to the non-availability of methohexitone. As a result, there has been more use of etomidate in our hospital as an anaesthetic agent for ECT. We would like to draw your attention to a case of a spontaneous seizure after administration of etomidate.

A young man aged 19 years had been an in-patient for 3 months, following the onset of a schizoaffective disorder. He was being treated with a course of ECT and his medication from the start of this treatment was chlorpromazine 1000 mg/day, procyclidine 15 mg/day and fluoxetine 20 mg/day. There was no relevant past medical history or previous history of seizures. Prior to his tenth treatment of ECT he experienced a spontaneous generalised tonic/clonic seizure while being induced under anaesthetic. He was administered etomidate initially 26 mg, which was increased to a dose of 30 mg as facial twitching was evident. He was then administered suxamethonium 75 mg. However, the twitching continued into a full grand mal seizure lasting about 90 seconds, which was terminated by 10 mg diazepam given intravenously.

Recovery from anaesthesia was otherwise normal and there was no evidence of postictal confusion or other physical sequelae. Etomidate was used as anaesthetic agent for this man's nine other ECT sessions, to a maximum dose of 28 mg with no adverse effect. Improvement in this young man's mood was maintained following this incident and it was decided to discontinue ECT.

Generalised seizures after short-term etomidate infusion have been reported during or after recovery from anaesthetic (Goroszeniuk *et al*, 1986; Krieger & Koemer, 1987; Hansen & Drenck, 1988). However, seizures have not yet been reported during induction of etomidate anaesthesia or while undergoing a course of ECT. There is no definite neuropharmacological explanation for this seizure-like activity of etomidate, which is thought to result from a disinhibition of subcortical activity, rather than a specific epileptogenic effect of the compound (Kugler *et al*, 1977).

Concurrent use of fluoxetine and chlorpromazine may have partly contributed, by lowering the seizure threshold. However, in this case the slightly higher dose of etomidate seems the most likely causative agent, as all other medication had been prescribed at the above doses throughout the course of ECT.

This case emphasises the importance of minimising adverse effects during ECT by using the lowest effective dose of anaesthetic agent and carefully considering concurrent usage of other medication.

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