Remember the Side Effects of Haloperidol: A Case Report

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ABSTRACT

An eighteen-year-old man who had a laminectomy and subtotal excision of a lipomyelomeningocele, received a single dose of haloperidol for post-operative pain and agitation. The patient suffered an acute dystonic reaction and was extensively investigated before the correct diagnosis and treatment was instituted. This case illustrates the ease with which extrapyramidal side effects following treatment with haloperidol may be overlooked in complicated medical or surgical cases. (**Critical Care and Resuscitation 2003; 5: 266-269**)

Key words: Haloperidol, benztropine, antipsychotic, neuroleptic drug, adverse drug effect, extrapyramidal syndrome

Haloperidol is a psychotropic drug of the butyrophenone family and is used for both chronic and short-term therapy. Long-term therapy is commonly used for psychotic disorders such as schizophrenia, senile psychosis or the manic phase of bipolar disorders.

Physicians not dealing with psychiatric patients are more familiar with the short-term indications in acutely confused states including the relief of delusions, delirium and aggressive behavior. Although haloperidol appears to function by blocking dopaminergic neurotransmission in the central nervous system, the precise mechanism for its therapeutic effects remains unknown.[1] Antipsychotic drugs also have the potential to cause the extrapyramidal syndrome (EPS), which includes a group of movement disorders of dystonia, akathisia, tardive dyskinesia and parkinsonism.[2]

Antipsychotic drug-induced EPS is thought to be caused by the blockage of central dopamine D_2 receptors.[3] Serious complications include neuroleptic malignant syndrome[4,5] and torsades de points[6-8] and demand the clinician pay close attention to patients receiving haloperidol.

The following case report illustrates a common adverse drug effect to haloperidol that was not recognised early, causing unnecessary investigations and treatment.

CASE REPORT

An eighteen-year male with an unremarkable past medical history presented with a 2-month history of disabling back and leg pain. Initially, his pain was controlled with gabapentin, dexamethasone and oral analgesics. However, his pain became unresponsive and magnetic resonance imaging (MRI) of his spine revealed an intradural lipoma extending from the lumbar vertebra (L2, L3) to the sacral vertebra (L5, S1) which measured 8 cm in length and 3.5 cm in diameter. There was encasement of the nerve roots of the cauda equina, with the conus adherent to the superior border of the lipoma. The MRI of the cervicothoracic spine and a computed tomography (CT) scan of the head were within normal limits.

An L2-L4 laminectomy and subtotal excision of the lipomyelomeningocele were performed to untether the spinal cord. While the patient did not sustain any additional neurologic deficits, because of the extensive dissection of his cauda equina he developed post-operative radicular leg pain which was treated with analgesia, gabapentin and decreasing doses of dexamethasone. Postoperatively he remained afebrile with no haemodynamic or respiratory compromise.

On the third post-operative day, the patient began complaining of escalating episodes of right shoulder

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and neck pain causing involuntary neck flexion on the right side. He was orientated, cooperative and responded appropriately to command. Sensory, motor, cerebellar and cranial nerve examinations were within normal limits. The patient was described as having "neck muscle spasms and persistent upward gaze." A diagnosis of atypical convulsions was made and he was admitted to the intensive care unit. A CT of his head and a lumbar puncture were performed, both of which revealed no abnormalities. However, on review of his medical chart, it was noted that twenty-four hours previously, the patient had received an extra dose of 8 mg of dexamethasone and 5 mg of haloperidol (intramuscularly) for radicular leg pain. He was given 2 mg of benztropine intravenously with complete resolution of his symptoms.

DISCUSSION

Haloperidol is widely used, in part because of the lack of cardiovascular side effects. There is a common perception that it controls agitation with virtually no adverse respiratory, cardiac, renal or haematopoietic effects. However, numerous reports illustrate that serious side effects can occur in all of these systems,[9-14] and dystonia of the larngopharyngeal muscles can cause throat tightness and dysphagia prompting inappropriate and hazardous medical interventions.[15-18]

Hennessy and coworkers performed a cohort study of psychiatric outpatients to determine the rates of cardiac arrest and ventricular arrhythmia in patients using antipsychotic drugs.[10] Compared with the control groups, patients taking antipsychotic drugs (mostly haloperidol) had a rate ratio of cardiac arrest or ventricular arrhythmia ranging from 1.7 to 3.2 and rate ratio for death ranging from 2.6 to 5.8. While the literature is replete with reports of the potential cardiovascular consequences of haloperidol,[6-8,19,20] not all sudden death episodes in patients taking neuroleptic drugs are attributable to the effect of the drug.[21]

Haloperidol has long been used in the management of the critically ill patient,[22-24] and is often used during weaning from mechanical ventilation. It is also used in critically ill agitated and delirious patients who are unresponsive to high doses of narcotics and benzodiazepines. Two studies have demonstrated that continuous infusions are safe and efficient in reducing nursing care time and to facilitate weaning.[25,26] Both studies noted prolongation of the QT_c interval in some patients that resolved with decreasing the drug infusion rate.

Critically ill patients can also experience movement disorders (e.g. tongue, hand or leg tremor) upon withdrawal of haloperidol,[27] requiring a differential diagnosis of metabolic disturbances, cerebral infections as well as structural lesions following trauma, strokes or neoplasms to be carefully considered. The effect of haloperidol may also be exacerbated in the critically ill patient with multiple organ dysfunction as the agent is metabolised by the cytochrome P_{450} system which may be compromised during surgical stress.[28]

Muscettola *et al*,[29] defined the extrapyramidal syndrome (EPS) as the adverse effects of neuroleptic drugs that include hyperkinetic (akathisia, acute dystonia, and acute dyskinesia), and hypokinetic Parkinson-like symptoms (e.g. bradykinesia, rigidity, and tremor). While, they found that elderly patients and duration of neuroleptic treatment were positive predictors of the EPS,[29] a United Kingdom study showed that extrapyramidal reactions reported for haloperidol (predominantly dystonia-dyskinesia) occurred within the first 3 days of treatment and the highest incidence was in younger patients, especially under 20 years of age.[30] They speculated that the incidence was higher in younger patients because of the reduction in D_2 receptors in the substantia nigra with increasing age.[30] Other retrospective studies have quoted between 20% to 30% extrapyridimal adverse drug effects with haloperidol and agree that younger age appears to be a risk factor for haloperidol-induced EPS.[31,32]

Schillevoort *et al*, identified 424 patients who started haloperidol for the first time, who had a 13.3% incidence of drug-induced EPS requiring benztropine.[3] Kurz *et al*,[33] also examined 59 first time users of haloperidol and reported that 73% required anticholinergic therapy to treat parkinsonian symptoms and 24% required beta adrenergic-blockers to counteract neuroleptic-induced akathisia. They found that 10.2% of haloperidol-treated patients developed dystonia during their first two weeks of treatment. Rosebush *et al*,[34] prospectively studied the neuroleptic side effect profile of 350 consecutive neuroleptic-naïve patients admitted to an acute care psychiatric hospital. Despite a low average daily dose of haloperidol (e.g. 3.7 mg), more than 50% of patients suffered extrapyramidal side effects with 127 episodes of acute dystonia that required immediate benztropine treatment. While the study included neuroleptic-naïve patients only, many patients were on concurrent medications known to cause EPS (e.g. selective serotonin reuptake inhibitors, tricyclic antidepressants). Ramaekers *et al*,[35] recruited twenty-one volunteers aged 18 to 35 years without any significant past medical or psychiatric history. They conducted tests of psychomotor, cognitive and extrapyramidal functions one hour before and 3 and 6 hours after haloperidol on days 1 and 5. Two subjects withdrew from the study, one because of akathisia after a 2 mg dose, the other subject suffered an acute dystonic reaction on day two. Approximately 65% of the volunteers experienced EPS requiring

anticholinergic medication during the first five days. Haloperidol also significantly interfered with the subjects' concentration causing increased somnolence and both mental and motor akathisia.

As the elimination half-life of haloperidol is 17 to 18 hours[36] it may exert prolonged effects. Anderson *et al*,[37] described a patient with akathisia 5 days after and dysphoria 6 weeks after receiving a single haloperidol dose of 5 mg. Alternatively, patients can experience a nearly immediate adverse drug effect.[38] Patients who have experienced drug-induced EPS are more likely to have future episodes if antipsychotic medications are re-introduced.[39] However, compared with oral haloperidol intravenous haloperidol may be associated with an EPS that is less severe.[40]

Haloperidol is easy to use and effective in controlling acute delirium and combative states. However, it has important adverse side effects that may be misinterpreted especially in complex medical or surgical patients. Our report illustrates the ease with which inappropriate investigations and management occurs because a common adverse drug event was not recognised. One ampoule of benztropine costs $2.40 (AUD). This patient's intensive care unit stay, medical fees, investigations (e.g. CT head, lumbar puncture, cerebrospinal fluid analysis), antibiotic course and one extra day in hospital, cost an extra $2715 .00 (AUD). We should mention the added distress the patient and family experienced.

Received 14 July 03
Accepted 22 August 03

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