

Research Article

## The Role of Antipsychotics in The Treatment of Agitated Patients After Traumatic Brain Injury

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### Abstract

Agitation is frequently observed in patients after traumatic brain injury and this clinical status is not only dangerous for the patient himself (risk of self-injury) and others, but also impedes medical management and hampers clinical assessment. Antipsychotics are part of the armamentarium for the treatment of this disorder in the clinical setting. Although, they are effective in dealing with agitation, they also affect level of consciousness and can have potential adverse effects on post-traumatic recovery. We present the experience of our department regarding the use of these drugs in agitated patients after traumatic brain injury and especially patients that do not need surgical intervention.

**Keywords:** Antipsychotics; Haloperidol; Diazepam; Agitation; Traumatic Brain Injury

### Introduction

Agitation is a relatively common complication in patients after traumatic brain injury, with a reported incidence of nearly fifty percent in some series [1]. The use of antipsychotics in these patients is sometimes necessary to avoid undesirable sequelae such as self-injury and aggressive behaviour, despite the fact that there are also risks associated with their administration. Most commonly used drugs in clinical practice include haloperidol and benzodiazepines (such as diazepam and bromazepam).

Haloperidol is a neuroleptic antipsychotic, widely used in the treatment of schizophrenia, which has no effect on level of consciousness or respiratory function but has as a side effect the development of extra-pyramidal symptoms due

to its ability to block dopamine D2 receptors [2]. Moreover, benzodiazepines are used to treat acute mania and other psychiatric emergencies but there are reports of adverse effects (such as impairment of motor recovery or even reappearance of previous stroke symptoms [3]). We present the experience of our department regarding the use of these drugs in agitated patients after traumatic brain injury and especially in patients that do not need surgical intervention.

### Materials and Methods

Over the last 3 years, 182 patients have been treated in our department after having sustained traumatic brain injury that did not meet the criteria for surgical intervention and were therefore treated conservatively. In 49 of these patients (44 males and 5 females) administration of antipsychotic

drugs (haloperidol, diazepam, bromazepam etc.) was deemed necessary due to episodes of agitation at some point during their hospitalization.

Particularly, during episodes of agitation 5mg of haloperidol along with 2,5mg of the anticholinergic biperiden were administered intramuscularly and sometimes this scheme had to be repeated in the same day. In other cases, instead of the combination haloperidol and biperiden, intramuscular administration of 5-10mg of diazepam was performed and only rarely was a higher dose required to control agitation. All patients that received either haloperidol or diazepam were under monitoring of their vital signs and respiratory function.

## Results

Patients that were treated with antipsychotics had a mean age of 49.2 years, while patients that did not require such medication had a mean age of 50.4 years. Mean duration of antipsychotics administration was 3½ days.

Regarding radiological findings among these 49 patients, frontal lobe contusions were found in 19, subdural hematoma (that did not meet the criteria for surgical evacuation) was found in 17, temporal lobe contusions in 7, traumatic subarachnoid hemorrhage was found in 4 while 2 patients presented with pneumocephalus.

## Discussion

Traumatic brain injury can cause a variety of impairments, such as mood and personality changes and cognitive dysfunction. Antipsychotics are commonly used after traumatic brain injury especially to control agitation. Prolonged use of antipsychotics has been shown to hinder recovery [4]. Specifically, haloperidol is associated with the development of neuroleptic malignant syndrome, a rare, but potentially lethal neurological [5]. Neuroleptic malignant syndrome should be suspected when patients develop symptoms such as high fever, dystonia, diaphoresis, tachycardia and decerebrate posturing [1]. D<sub>2</sub> receptor agonists improve functional outcome after brain trauma, but haloperidol acts as an antagonist of dopamine D<sub>2</sub> receptors, thus explaining in part how it hinders recovery [6,7].

The age of the patient does not seem to correlate with the occurrence of agitation episodes. Contrary to that, type and localization of traumatic brain injury seems to be associated with such episodes. Patients with frontal lobe contusions are more likely to become agitated and require administration of antipsychotics and particularly for more days than patients with traumatic brain injury of other types. Most commonly administered drugs are haloperidol (in combination with the anticholinergic biperiden) and diazepam.

## Conclusions

Patients after traumatic brain injury and especially those that do not, yet, have an indication for surgical intervention must be followed clinically. In particular the most important factor estimated is the level of consciousness based on the Glasgow Coma Scale. Unfortunately, antipsychotic drugs impair level of consciousness, thus making it very difficult to clinically assess the patient. However, the use of these drugs is sometimes imperative because due to agitation, these patients often hinder their treatment (removal of catheters, IV canulas, damage of monitors etc.)

Although, there are reports of impairment on motor recovery, memory retention and restoration of spatial learning after long-term administration of haloperidol, in our series of short-term administration (mean: 3½ days) no such effect was observed [8]. However, treating physicians should be very cautious when using these drugs.

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