Catatonia

Dr C P Sedain,
Professor
Dept of Psychiatry
Chitwan medical college, Bharatpur,Nepal

Catatonia refers to a cluster of striking motor signs occurring with idiopathic psychosis (mood disorders, schizophrenia), intrinsic brain disease, metabolic disorders affecting brain function, and drug-induced syndromes. It may also be seen in many medical disorders including infections (such as encephalitis), autoimmune disorders, focal neurologic lesions (including strokes), metabolic disturbances, alcohol withdrawal(-Geoffroy et al ,2012). The motor symptoms include abnormalities of posture, tone, volitional motor activity, and speech and there may be periods of extreme hyperactivity or hypoactivity. Typical features of the catatonic syndrome include mutism, stupor, stereotypy, posturing, catalepsy, automatic obedience, negativism, echolalia, or echopraxia, provides a classification of motor signs observed in catatonic patients.Although catatonia occurs in both functional and organic disorders, the treatment of the catatonic phase is essentially the same, and most patients respond well to benzodiazepines or ECT. In some cases, treatment of the underlying disorder may have to be suspended (e.g. not using antipsychotics in acute catatonic schizophrenia) until the catatonic phase is resolved. This suggests that catatonia is a unique syndrome that requires treatment in its own right, independent of any underlying disorder. Hence, the more specific features are given greater significance when making a diagnosis of catatonia, and it is these specific features that generally dictate whether separate treatment, in addition to or, in some cases, instead of, the standard treatment for the underlying disorder is needed.

Catatonia is an important phenomenon in both psychiatry and neurology. The different types of catatonia, the position of catatonia in the psychiatric classificatory systems, use of catatonia rating scales and the association between catatonia and neuroleptic malignant syndrome are also covered. Abnormalities that have been hypothesised as being possible underlying mechanisms in catatonia are highlighted. The article aims to provide clinicians with a comprehensive update on the subject, with information derived from an extensive range of relevant references. The concept of catatonia was first described by **Kahlbaum (1874).** Catatonic stupor is one of the most dramatic psychiatric presentations, but is becoming increasingly rare in the Western world. However, it has been suggested that catatonia is under-recognised and under-diagnosed **(Van der Heijden et al, 2005**). Although the introduction of antipsychotics has reduced the incidence of catatonia, it is still not uncommon (Stompe *et al*, 2002) and its detection rate can be significantly improved by using a standardised rating scale (Van der Heijden *et al*, 2005).

Mechanism of catatonia

The exact cause of catatonia has not been elucidated, but a number of hypotheses have been offered.According to Northoff (2002), a 'top-down modulation' of basal ganglia due to deficiency of cortical gamma-aminobutyric acid (GABA), the primary inhibitory neurotransmitter of the brain, may explain the motor symptoms of catatonia. This explanation might account for the dramatic therapeutic effect of benzodiazepines, which cause an increase in GABA activity. Similarly, hyperactivity of glutamate, the primary excitatory neurotransmitter, has also been suggested as an underlying neurochemical dysfunction (Northoff *et al*, 1997).Osman & Khurasani (1994) have suggested that catatonia is caused by a sudden and massive blockade of dopamine. This may explain why dopamine-blocking antipsychotics are not generally beneficial in catatonia. Indeed, by exacerbating dopamine deficiency, antipsychotics may actually precipitate a worsening of the condition. Clozapine-withdrawal catatonia is postulated to be due to cholinergic and serotonergic rebound hyperactivity (Yeh *et al*, 2004). In chronic catatonia with prominent speech abnormalities, positron emission tomography (PET) has identified abnormalities in metabolism bilaterally in the thalamus and frontal lobes (Lauer *et al*, 2001).

Clinical features of catatonia-

Catatonia is a syndrome that encompasses more than two dozen signs, some of which are relatively non-specific.

Automatic obedience-The patient demonstrates exaggerated cooperation, automatically obeying every instruction of the examiner. *Mitmachen* and *Mitgehen* are forms of automatic obedience. In *Mitmachen* the body of the patient can be put into any posture, even if the patient is given instructions to resist. *Mitgehen* is an extreme form of automatic obedience in which the examiner is able to move the patient's body with the slightest touch, but the body part immediately returns to the original position (unlike in waxy flexibility).

Ambitendency-The patient alternates between resistance to and cooperation with the examiner's instructions; for example, when asked to shake hands, the patient repeatedly extends and withdraws the hand.

Stupor-Stupor is the classic and most striking catatonic sign. It is a combination of immobility and mutism, although the two can also occur independently.

Posturing-The patient is able to maintain the same posture for long periods. A classic example is the 'crucifix'. An extreme version of posturing is catalepsy.

Waxy flexibility (cerea flexibilitas)-The examiner is able to position the patient in what would be highly uncomfortable postures, which are maintained for a considerable period of time.

Negativism (Gegenhalten)-The patient resists the attempts of the examiner to move parts of their body and, according to the original definition, the resistance offered is exactly equal to the strength applied.

Psychological pillow-The patient assumes a reclining posture, with their head a few inches above the bed surface, and is able to maintain this position for prolonged periods.
Forced grasping-The patient forcibly and repeatedly grasps the examiner's hand when offered.
Obstruction-The patient stops suddenly in the course of a movement and is generally unable to give a reason. This appears to be the motor counterpart of thought block.
Echopraxia-The patient imitates the actions of the interviewer.
Aversion-The patient turns away from the examiner when addressed.
Mannerisms-These are repetitive, goal-directed movements (e.g. saluting).
Stereotypies-These are repetitive, regular movements that are not goal-directed (e.g. rocking).
Motor perseveration-The patient persists with a particular movement that has lost its initial relevance.
Excitement-The patient displays excessive, purposeless motor activity that is not influenced by external stimuli.
Speech abnormalities-Echolalia, logorrhoea and verbigeration are the main speech abnormalities in catatonia. Echolalia refers to the repetition of the examiner's words. Logorrhoea is characterised by incessant, incoherent and usually monotonous speech. Verbigeration is a form of verbal perseveration in which the patient repeats certain syllables (logoclonia), words (palilalia), phrases or sentences.
Other catatonic signs-If, in addition to prominent catatonic signs, the patient exhibits hyperpyrexia, clouding of consciousness and autonomic instability, a diagnosis of lethal or malignant catatonia should be considered.

Differential diagnoses of catatonia-

- Schizophrenia
- Depression
- Mania
- Organic disorders: e.g. infections, epilepsy, metabolic disorders
- Drugs: prescribed or recreational
- Hysteria (psychogenic catatonia)
- Idiopathic

Types of catatonia

Taylor & Fink (2003) believe that catatonia should be classified as an independent syndrome with the following subtypes: non-malignant, delirious and malignant. The non-malignant type refers to the classic features first described by Kahlbaum, the delirious type includes delirious mania, and the malignant type includes lethal catatonia, neuroleptic malignant syndrome and serotonin syndrome. Van Den Eede & Sabbe (2004) have proposed an alternative classificatory system. They divide catatonia broadly into non-malignant and malignant types, with each further divided into retarded and excited subtypes. In their system, classic catatonia (Kahlbaum syndrome), delirious mania, neuroleptic malignant syndrome and lethal catatonia would respectively be examples of the non-malignant retarded, non-malignant excited, malignant retarded and malignant excited subtypes. A further classification, used by the Wernicke–Kleist–Leonhard school of psychiatry, which has proponents especially in Germany, identifies two main types of catatonia systematic and periodic. These appear to have significant differences in symptomatology, treatment and prognosis (Pfuhlmann & Stober, 2001). The systematic type is less genetically determined, has a higher prevalence and earlier age at onset in males (Stober *et al*, 1998), and is associated with mid-gestational infections (Stober, 2001). Periodic catatonia has no differences in either age at onset or prevalence between males and females). Periodic catatonia, according to Stober *et al*(2002), is the first subtype of schizophrenia with confirmed genetic linkage. Leonhard (1979) differentiated chronic catatonia, on the basis of the speech abnormalities present, into speech-prompt and speech-sluggish (speech-inactive) types. A specific category of autistic catatonia has been suggested for catatonia occurring in people with developmental disorders (Hare & Malone, 2004

Investigations

Basic investigations

- Full blood count
- Renal function tests
- Liver function tests
- Thyroid function tests
- Blood glucose measurement
- Creatine phosphokinase measurement
- Drug screen of urine

Further investigations

- Electrocardiography
- CT head
- Magnetic resonance imaging
- Electroencephalography
- Urine culture
- Blood culture
- Test for syphilis
- Test for HIV
- Auto-antibody screen
- Lumbar puncture

Management of catatonia

- Benzodiazepines
- Electroconvulsive therapy

Other options rarely (for catatonia resistant to benzodiazepines and ECT)

- Mood stabilisers: especially carbamazepine
- Antipsychotics
- NMDA antagonists: amantadine and memantine
- Dopamine agonists (e.g. bromocriptine) and skeletal muscle relaxants (e.g. dantrolene), especially if neuroleptic malignant syndrome is suspected.

Benzodiazepines are the drugs of choice for catatonia. Patients who are unresponsive or in-sufficiently responsive to benzodiazepines need electroconvulsive therapy (ECT). In a prospective, open study (Ungvari *et al*, 1994*a*), 18 patients with catatonia were treated with either oral lorazepam or intramuscular diazepam; 16 showed significant clinical improvement within 48 hour, with two showing complete remission after just one dose. However, nine patients needed subsequent ECT to achieve further improvement. Rosebush *et al*(1990) reported an even more dramatic response to lorazepam, with 12 out of 15 in-patients with catatonia responding completely within 2 hour. Small doses of benzodiazepines are effective in both catatonic stupor and catatonic excitement (Ungvari *et al*, 1994*b*.Emergency ECT is the treatment of choice for malignant catatonia (Pommepuy & Januel, 2002). The Royal College of Psychiatrists' guidelines on ECT (Scott, 2005) specify that ECT may be indicated for catatonia if treatment with lorazepam has been ineffective. Antipsychotics are generally not recommended during a catatonic phase even if there is an underlying psychotic illness such as schizophrenia, as the risk of precipitating neuroleptic malignant syndrome is considerably increased. However, they may be effective in treatment-resistant catatonia: Hesslinger *et al*(2001) reported that a patient with catatonia unresponsive to benzodiazepines showed dramatic and persistent improvement on risperidone. In a literature review, Van Den Eede *et al*(2005) concluded that atypical antipsychotics may have a role in the treatment of non-malignant catatonia. Kritzinger & Jordaan (2001) have suggested that carbamazepine is effective in both the acute and maintenance phases of catatonia; in their sample of nine patients, four responded completely to carbamazepine, one showed partial response and the remaining four showed no significant improvement.

Mastain *et al* (1995) reported that zolpidem was effective in a patient with catatonia that was resistant to benzodiazepines and ECT. There are case reports of amantadine (Northoff *et al*, 1999) and memantine (Thomas *et al*, 2005) being effective in catatonia. These are antagonists at the *N*-methyl-d-aspartate (NMDA) receptor. Glutamate acts on the NMDA receptor, and if this receptor is blocked, the neurochemical balance is tilted in favour of GABA. Thus, both pro-GABA and anti-glutamate drugs seem to be beneficial in catatonia. Catatonia will almost certainly necessitate in-patient treatment. The patient will need intensive nursing and regular monitoring of vital signs, and may need transfer to a psychiatric intensive care unit if there is catatonic excitement. The physical condition of the patient, especially in prolonged catatonia, may warrant intravenous fluids and parenteral nutrition.

Complications of catatonia

Obviously, if a patient with catatonia does not eat or drink for prolonged periods this will lead to dehydration and its attendant complications. The immobility of catatonia may increase the risk of deep-vein thrombosis (Morioka *et al*, 1997). McCall *et al* (1995) have highlighted the increased risk of death due to pulmonary embolism in patients with persistent catatonia; such deaths occurred only after the second week of catatonia, often without warning. During the phase of catatonic excitement, the patient may pose a significant risk of harm to self and others.

References

1. Geoffroy PA, Rolland B, Cottencin O. (2012). "Catatonia and alcohol withdrawal: a complex and underestimated syndrome.". *Alcohol Alcohol.* 47 (3): 288–90.
2. *Hare, D. J. & Malone, C. (2004) Catatonia and autistic spectrum disorders. Autism, 8, 183–195.*
3. *Hesslinger, B., Walden, J. & Normann, C. (2001) Acute and long-term treatment of catatonia with risperidone. Pharmacopsychiatry, 34, 25–26.*
4. *Kahlbaum, K. L. (1874) Die Katatonie oder das Spannungsirresein. August Hirschwald.*
5. *Kritzinger, P. R. & Jordaan, G. P. (2001) Catatonia: an open prospective series with carbamazepine. International Journal of Neuropsychopharmacology, 4, 251–257.*
6. *Lauer, M., Schirrmeister, H., Gerhard, A., et al (2001) Disturbed neural circuits in a subtype of chronic catatonic schizophrenia demonstrated*

by F-18-FDG-PET and F-18-DOPA-PET. Journal of Neural Transmission, 108, 661–670.

7. *Leonhard, K. (1979) The Classification of Endogenous Psychoses (5th edn). Transl. R. Berman. Irvington.*
8. *Mastain, B., Vaiva, G., Guerouaou, D., et al (1995) [Favourable effect of zolpidem on catatonia] (in French). Revue Neurologique, 151, 52–56.*
9. *McCall, W. V., Mann, S. C., Shelp, F. E., et al (1995) Fatal pulmonary embolism in the catatonic syndrome: two case reports and a literature review. Journal of Clinical Psychiatry, 56, 21–25.*
10. *Morioka, H., Nagatomo, I., Yamada, K., et al (1997) Deep vein thrombosis of the leg due to psychiatric stupor. Psychiatry and Clinical Neurosciences, 51, 323–326.*
11. *Northoff, G. (2002) What catatonia can tell us about 'top-down modulation': a neuropsychiatric hypothesis. Behavioural and Brain Sciences, 25, 555–577.*
12. *Northoff, G., Eckert, J. & Fritze, J. (1997) Glutamatergic dysfunction in catatonia? Successful treatment of three akinetic catatonic patients with the NMDA antagonist amantadine. Journal of Neurology, Neurosurgery and Psychiatry, 62, 404–406.*
13. *Northoff, G., Lins, H., Boker, H., et al (1999) Therapeutic efficacy of N-methyl-d-aspartate antagonist amantadine in febrile catatonia. Journal of Clinical Psychopharmacology, 19, 484–486.*
14. *Osman, A. A. & Khurasani, M. H. (1994) Lethal catatonia and neuroleptic malignant syndrome. A dopamine receptor shutdown hypothesis. British Journal of Psychiatry, 165, 548–550.*
15. *Pfuhlmann, B. & Stober, G. (2001) The different conceptions of catatonia: historical overview and critical discussion. European Archives of Psychiatry and Clinical Neuroscience, 251 (suppl. 1), 14–17.*
16. *Pommepuy, N. & Januel, D. (2002) [Catatonia: resurgence of a concept. A review of the international literature] (in French). L'Encéphale, 28, 481–492.*
17. *Rohland, B. M., Carroll, B. T. & Jacoby, R. G. (1993) ECT in the treatment of the catatonic syndrome. Journal of Affective Disorders, 29, 255–261.*
18. *Rosebush, P. I., Hildebrand, A. M., Furlong, B. G., et al (1990) Catatonic syndrome in a general psychiatric inpatient population: frequency, clinical presentation, and response to lorazepam. Journal of Clinical Psychiatry, 51, 357–362.*
19. *Scott, A. I. F. (2005) College guidelines on electroconvulsive therapy: an update for prescribers. Advances in Psychiatric Treatment, 11, 150–156.*
20. *Stober, G. (2001) Genetic predisposition and environmental causes in periodic and systematic catatonia. European Archives of Psychiatry and Clinical Neuroscience, 251 (suppl. 1), 121–124.*
21. *Stober, G., Seelow, D., Ruschendorf, F., et al (2002) Periodic catatonia: confirmation of linkage to chromosome 15 and further evidence for genetic heterogeneity. Human Genetics, 111, 323–330.*
22. *Taylor, M. A. & Fink, M. (2003) Catatonia in psychiatric classification: a home of its own. American Journal of Psychiatry, 160, 1233–1241.*
23. *Thomas, C., Carroll, B. T., Maley, R. T., et al (2005) Memantine and catatonic schizophrenia. American Journal of Psychiatry, 162, 626.*
24. *Ungvari, G. S., Leung, C. M., Wong, M. K., et al (1994a) Benzodiazepines in the treatment of catatonic syndrome. Acta Psychiatrica Scandinavica, 89, 285–288.*
25. *Ungvari, G. S., Leung, H. C. & Lee, T. S. (1994b) Benzodiazepines and the psychopathology of catatonia. Pharmacopsychiatry, 27, 242–245.*
26. *Van Den Eede, F. & Sabbe, B. (2004) Catatonia in psychiatric classification. American Journal of Psychiatry, 161, 2327–2328.*
27. *Van Den Eede, F., Van Hecke, J., Van Dalfsen, A., et al (2005) The use of atypical antipsychotics in the treatment of catatonia. European Psychiatry, 20, 422–429.*
28. *Van der Heijden, F. M., Tuinier, S., Arts, N. J., et al (2005) Catatonia: disappeared or under-diagnosed? Psychopathology, 38, 3–8.*
29. *Yeh, A. W., Lee, J. W. & Cheng, T. C., et al (2004) Clozapine withdrawal catatonia associated with cholinergic and serotonergic rebound hyperactivity: a case report. Clinical Neuropharmacology, 27, 216–218.*