

# The Treatment of Psychotic Disorders in Late Life

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**Objective:** To review the epidemiology, phenomenology, and treatment of psychotic disorders in late life.

**Method:** The literature relating to psychotic symptoms in the elderly is reviewed, with a focus on the following categories: primary psychotic disorders, mood disorders, delirium, Parkinson's disease (PD), and somatic hallucinoses (including Charles Bonnet syndrome [CBS] and musical hallucinosis). Practical clinical treatment implications are discussed.

**Results:** The prevalence of psychotic symptoms increases with age, largely because of underlying medical illnesses such as dementia, delirium, and other neurological disorders that are exacerbated by sensory deficits coupled with social isolation. Treatment with the traditional high-potency neuroleptics is complicated by extrapyramidal symptoms, and sedation, postural hypotension, and anticholinergic effects complicate the use of low-potency traditional agents. Although clozapine may have a narrow use in treatment-resistant schizophrenia and PD, it is poorly tolerated in the elderly. Risperidone has a wider use in this population and has a favourable clinical profile (at low doses). Other new neuroleptics await more formal evaluation in the elderly.

**Conclusion:** Psychotic disorders in old age have more organic associations, which cause greater difficulty in their treatment. Further evaluation of the use of the atypical agents in this elderly group is indicated.

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**Key Words:** psychosis, geriatric, pharmacotherapy, Charles Bonnet syndrome, musical hallucinosis, Parkinson's disease

Psychoses in late life can be chronic illnesses carrying over from younger life or new disorders developing de novo, with or without clear associations with other psychiatric or medical conditions. Aside from the classical DSM-IV psychotic disorders, such as schizophrenia and delusional disorders, the mood disorders can also cause psychotic symptoms. Particularly important in the elderly, however, are psychotic symptoms related to underlying cognitive disorders such as delirium and dementia. The prevalence of both delirium and dementia increases in old age, and psychotic symptoms are often much more troublesome to caregivers and to the patients themselves than the underlying memory deficits. Dr Nathan Herrmann (1) reviews the pharmacological treatment of be-

havioural disturbances in dementia in this issue, so this topic will not be covered in detail here. Medical problems common in old age, such as PD and sensory deficits, can also be associated with psychotic symptoms, which can cause further difficulties in patient management.

## Psychotic Symptomatology

Late-onset psychosis can have a variety of symptoms, including frank delusions and hallucinations, but also paranoid misidentifications and other Schneiderian symptoms. Delusions, especially paranoid ones, are most often the focus of treatment in the elderly population. These might be primary, as part of a primary psychotic disorder, or secondary, arising directly out of another medical or psychiatric disorder. The delusion may take a variety of forms, from bizarre (common in disorganized schizophrenia) to almost believable and difficult to differentiate from the real-life experiences of the patient. Delusions of late-onset delusional disorder are often plausible at first, consisting of simple delusions of theft, for example, which can delay recognition of the disorder and postpone treatment.

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### Risk Factors for Late-Onset Psychosis

Psychosis as a symptom increases with age, and this may be more pronounced in women. The cause of the increase may be age-related deterioration, or it may be specific to various diseases that are more common in old age. There are many theoretical models to explain the increase in psychotic symptoms in old age (2). These would include release phenomena, deafferentiation, imbalance between sensory and motor inputs, as well as brain irritation. Investigators have looked at a variety of localizations associated with psychosis, such as the frontal lobes or the temporal lobes, the dominant or nondominant hemispheres, and cortical versus subcortical structures.

A variety of other factors contribute to the development of psychotic symptoms in the elderly. Cognitive impairment is clearly a contributing factor because it makes older people more vulnerable to developing psychotic symptoms and/or full-fledged delirium in a variety of circumstances such as medical illness. Florid delirium in general is more common in older people and can cause a variety of psychotic symptoms, as reviewed by Lipowski (3). Illusions or misperceptions of the environment are also more common with age and cognitive impairment. Sensory impairment has been associated by Christenson and Blazer (4) with the development of various types of psychoses. Specific psychoses related to sensory impairment include musical hallucinations and CBS. These 2 syndromes have some intriguing similarities to phantom limb syndrome, which involves regional sensory deprivation after the removal of sensory stimuli due to the loss of a limb.

Premorbid paranoid personality traits may contribute to the development of paranoid delusions. Because elderly people with late-onset psychotic symptoms tend to be isolated psychosocially (5,6), preoccupation with these delusions can become all-encompassing. For incompletely understood reasons, women are at higher risk of developing late-onset psychosis. Genetics also play a role, especially in the more major psychiatric disorders such as schizophrenia, but they exert a lesser influence than in early-onset psychosis.

Most importantly, the use of medications, especially those with dopaminergic or anticholinergic activity, is a major contributor to the development of psychotic symptoms in older people (7). This can become a thorny management issue if the offending medications are critical to the management of other illnesses, such as PD.

### Neuroimaging

Neuroradiological findings are somewhat mixed in patients with late-onset psychosis. Computerized tomography scan studies suggest that the ventricle-to-brain ratio is greater in patients with late-onset psychosis than in healthy

subjects but less than in those with dementia of Alzheimer's type (8,9). There is mixed evidence for the association of psychosis with white matter hyperintensities on magnetic resonance imaging. Cerebral flow changes have been investigated on single photon emission computed tomography scans, and Lesser and others (10) found reduced cerebral blood flow in significant numbers of patients with late-onset psychosis. Flint and others (11) suggested an association between vascular lesions and late-onset psychosis.

### General Treatment Issues

Many older people are hesitant to seek mental health care. It is well known that although mental health problems such as dementia become more common in old age, older people are less likely to use the formal mental health care system (12), partly because of an increased perception of stigma but also because of a reduced psychological mindedness and familiarity with psychological concepts. Their reduced physical mobility and loss of independent transportation also make it difficult for older people to access outpatient treatment programs. Unfortunately, many mental health services worldwide still rely heavily on office-based practice (see Diekmann and Nissle's recent review [13] of psychogeriatrics in Germany, for example), making this a major problem. Those patients with poor social supports are particularly difficult to engage in treatment because in addition to the accessibility problems described above, they suffer from the lack of supervision for pharmacotherapy. The development of paranoia further complicates the treatment regimen of an older person with psychotic illness. People with late-onset psychosis also appear to have even poorer insight into their illness than those with early-onset psychosis (14), and those with cognitive impairment have reduced understanding of their treatment options.

Organic comorbid illness becomes more common with old age and may be associated with a poor prognosis for the resolution of psychotic symptoms. The pharmacological treatment of the psychosis can interact with the medications prescribed for medical illnesses and worsen the psychosis or the medical illness. It is important to work closely with the family physician to minimize the total number of concurrent medications and untreated medical or psychiatric illnesses that may be exacerbating psychotic symptoms. Anticholinergic (such as first-generation tricyclic antidepressants) and antiparkinsonian medications must be explored as possible causes of psychotic symptoms. Doses of remaining necessary medications should be reduced as much as is clinically feasible. If at all possible, necessary medications should be administered with clear explanations, rather than hidden in food, because unusual flavours in the food can lead some patients to believe they are being poisoned.

Perceptual functioning, such as hearing or vision, must be optimized. Sometimes modification of the environment may be successful in reducing the burden of psychotic symptoms, for example, improving the lighting to minimize illusions and other misinterpretations.

### Practical Use of Neuroleptic Medications in the Geriatric Population

The use of specific medications in older people is increasingly complicated with old age. Extrapyramidal, sedative, anticholinergic, and hypotensive side effects of neuroleptics become limiting factors in many patients. Tardive dyskinesia becomes frequent in older psychogeriatric patients (15–17), which may be partly explained by cumulative years of use, but possibly also by increased vulnerability. Older women seem to be particularly vulnerable.

Both traditional and nontraditional neuroleptics have a role in the treatment of psychosis in the elderly. Compared with the traditional high-potency agents such as haloperidol, pimozide, or trifluoperazine, traditional low-potency agents like chlorpromazine and thioridazine are more sedating, more hypotensive, and have more anticholinergic toxicity. At high doses, thioridazine also has ocular toxicity. Extrapyramidal effects, though, are fewer for low-potency agents than for high-potency ones. Intermediate-potency agents, such as perphenazine and loxapine, have considerable usefulness in certain cases because of their intermediate side effect profile, especially, for example, for patients who are sensitive both to extrapyramidal symptoms and to anticholinergic effects.

A number of newer neuroleptics have recently become available or are currently in various stages of testing (18) including clozapine, risperidone, olanzapine, sulpiride, amisulpiride, ziprazidone, sertindole, and seroquel. Most have not been evaluated extensively in elderly populations.

Both clozapine and risperidone have a mechanism of action somewhat different from the classical antipsychotics. Clozapine is a stronger dopamine blocker at  $D_1$  receptors than at  $D_2$  receptors. It is also active at 5-hydroxytryptamine ( $5-HT_2$ ) receptors and is known to have  $D_4$  receptor activity. Clozapine appears useful in younger patients with treatment-resistant schizophrenia and is more successful at treating negative symptoms than traditional neuroleptics. This is likely also true in older populations. Furthermore, clozapine is believed to have a reduced risk of causing tardive dyskinesia (19).

However, clozapine has been shown in general populations to have troublesome side effects related to histamine ( $H_1$ ) receptor antagonism and high muscarinic receptor affinity. These side effects include significant sedation, weight gain (20,21), constipation, and dry mouth, which tend to be even more problematic in the elderly than in the young. The postural hypotension documented in younger patients and in

older patients (22) is even more noxious in the frail elderly with preexisting postural instability and osteoporosis because it increases the likelihood of fractures. In spite of this, in special populations (such as in those with Parkinson's disease) where reduced extrapyramidal effects are paramount in the choice of a neuroleptic, clozapine may be worth trying (23). The most serious side effect, of course, is the development of fatal agranulocytosis, which necessitates frequent blood monitoring, causing its own stressors, particularly in agitated people or in those who have poor veins for phlebotomy.

Studies of clozapine in older adults include that by Oberholzer and others (24), who retrospectively studied 18 geriatric patients with a variety of diagnoses, including dementia, and found that clozapine (mean dose 53.2 mg) was withdrawn in only 4 patients for either ineffectiveness or side effects. Frankenburg and Kalunian (25) found that clozapine was helpful in 6 out of 8 geriatric patients with refractory psychoses but caused confusion in the remaining 2. Two patients had significant hypotension. Pitner and others (26) prescribed clozapine to 4 elderly patients with either dementia or psychosis and found significant adverse effects (doses 6.25 to 37.5 mg/day) in all 4, with only 2 patients eventually improving in psychotic symptomatology. Chengappa and others (22) studied 12 patients over 60 years of age who had received clozapine and found that none of the 6 patients who were rapidly titrated to 300 mg/day remained on clozapine but that the 4 patients who had a slow titration phase to a mean of 150 mg/day remained clinically improved on the drug. Seven patients stopped clozapine because of postural hypotension, one had agranulocytosis, and another had leukopenia. Salzman and others (27) also found a high rate of side effects at a mean dose of clozapine 210 mg/day in 20 older patients with a variety of diagnoses.

Risperidone (28) is a neuroleptic with strong binding at  $5-HT_2$  receptors as well as affinity for  $D_2$  receptors, and unlike clozapine, it does not have an increased risk (compared with conventional neuroleptics) of causing agranulocytosis. Protein binding does not appear to be affected by age, but the elimination rate and clearance of 9-hydroxy-risperidone are reduced in renal patients and in the elderly because of reduced creatinine clearance (29). Risperidone is well tolerated in older people (30–32) and appears to be effective in the treatment of psychosis (17,32–35). It has been found effective in some younger (36) and elderly (37) psychotic patients unresponsive to conventional neuroleptics. It may be more effective than other neuroleptics for patients who have complex visual hallucinations (38).

Risperidone has reduced extrapyramidal effects compared with haloperidol (30,39) at low doses and seems also to have effects on improving negative symptoms of chronic psychotic illness. Some studies (40,41) have found that risperidone, like

clozapine, has beneficial effects on tardive dyskinesia. Positive effects of risperidone on cognition in schizophrenia in younger (42) and older patients (43) suggest that the benefits in the cognitively impaired elderly may be worth considering. In younger patients with psychosis, there are studies suggesting that risperidone has a greater therapeutic effect on hostility than placebo or haloperidol (44), suggesting that psychosis with hostility might be another area where risperidone has clinical utility.

## Special Clinical Situations

### *Late-Onset Schizophrenia and Delusional Disorders*

The elimination of the cutoff age of 45 years for the development of schizophrenia has changed the prevalence figures for the major psychotic disorders in the elderly. In the Epidemiologic Catchment Area (ECA) surveys, Myers and others (45), using DSM-III criteria, found schizophrenia rates under 0.1%; with DSM-IV criteria, however, these rates are higher. Primary psychotic disorders appear to have variations in their clinical presentation depending on the initial age of onset, as well as on the current age of the patient (9). Elderly, early-onset schizophrenic patients are more likely to have hallucinations and delusions than either late-onset schizophrenic patients or young, early-onset schizophrenic patients. Schneiderian first-rank symptoms are more common in young, early-onset schizophrenic patients than in either late-life-onset schizophrenic patients or elderly, early-onset schizophrenic patients. Negative symptoms are less common in late-life-onset schizophrenic patients than in early-onset schizophrenic patients of any age.

Andreasen and Black (46) estimate the general community prevalence rate of delusional disorder to be 24 to 30 per 100 000 persons, but in a geriatric population, Christenson and Blazer found the prevalence of persecutory ideation to be as high as 4% (4). In general, delusional disorder increases in middle to old age. Delusions are most commonly persecutory but may also be delusions of reference, delusions of control, grandiose delusions, and hypochondriacal delusions (47). Paranoid delusional disorder is commonly seen by geriatric psychiatrists, and interventions can be very difficult because the affected patients often have a much-reduced support system and actively resist mental health intervention.

The clinical course of psychosis in old age tends to be chronic. Miller and others (48) found that, compared with healthy elderly subjects, patients with late-onset psychosis do more poorly on neuropsychological tests, particularly those testing frontal lobe and memory abilities. Almeida and others (49) also found that general cognitive functioning (as measured by the Mini-Mental State Examination [MMSE], Cambridge Cognitive Examination [CAMCOG], and Wechsler Adult Intelligence Scale—Revised [WAIS-R] verbal and performance scores) was significantly lower in psychotic older

people than in normal controls. The development of late-onset psychosis might then be seen as a symptom of preclinical cognitive impairment that may eventually progress to full dementia. The inconsistency of these results from various studies, however, limits the clinician's ability to make unequivocal predictions of eventual cognitive decline after the development of psychotic symptoms or the discovery of possible markers such as white matter intensities on magnetic resonance imaging or cerebral blood flow changes on single photon emission computed tomography investigations.

The results of neuroleptic treatment in late-life-onset psychosis vary depending on the study and clinical group. Complete remission figures, generally using traditional neuroleptics, vary from 60.5%, reported by Post (50), to as low as 27%, reported by Howard and Levy (51). Poor treatment response is predicted by schizoid personality traits (52), an absence of auditory hallucinations or affective symptoms (53), and a clinical picture of paranoid delusions alone (54). This is analogous to younger populations, for whom more florid symptoms are associated with a better prognosis.

The response to traditional neuroleptic medication is often limited by the development of side effects, although patients with late-onset psychosis often respond to lower doses than do early-onset psychotic patients. Long-acting neuroleptics, for example, haloperidol, flupenthixol, fluphenazine, and possibly the newly introduced zuclopenthixol, are often particularly helpful for elderly patients with poor medication compliance due to dementing illness or paranoid delusions about medications. Doses used are often low in patients with late-onset symptoms: a typical starting haloperidol dosage is 0.5 to 1 mg/day (55).

The atypical neuroleptic risperidone (unfortunately still not available in injectable or liquid form in Canada), used in doses as low as 0.5 mg/day, with low anticholinergic toxicity and reduced extrapyramidal symptoms, is becoming increasingly useful in geriatric psychiatry. Haloperidol is also still useful, however, because of its flexibility of administration (injectable short-acting or long-acting, tablet, or liquid forms available) and low likelihood of causing delirium, in spite of its tendency to cause extrapyramidal effects.

Ideally, doses of neuroleptics are started low, increased slowly, and maintained at the lowest possible levels. Attempts to decrease the doses should be made regularly, as the aging process can change drug distribution and metabolism and thereby increase toxicity and other adverse outcomes such as falls.

### *Mood Disorders*

Although clinicians often assume that mood disorders have a different clinical presentation in the elderly, including, for example, greater somatization or psychosis, Blazer and others (56) have suggested that the symptoms of major

depression associated with melancholia do not change much from middle to old age. Conwell and others (57) and Herrmann and others (58) also found that late-onset depression is not more likely to be associated with psychosis. Psychotic symptoms do occur frequently in serious mood disorders, however: 25% of patients hospitalized with major depression in Coryell and others' survey (59), and 14% of patients with major depression in the ECA studies (60). Hallucinations are usually mood-congruent, with a self-deprecatory or hopeless content in depression and a more grandiose content in mania. Delusions are similarly mood-congruent and can be florid, making differentiation from such primary psychotic disorders as schizophrenia difficult at times. Command hallucinations pertaining to suicide are particularly dangerous because of the high suicide rate in the elderly. Any psychotic symptoms, however, make treatment a greater challenge, especially if a patient is socially isolated and has a poor social support system.

Treatment of psychosis associated with a major depressive illness usually consists of antidepressants (in possibly higher doses than in nonpsychotic depression) along with a neuroleptic. Parker and others (61) performed a metaanalysis on 44 studies of the treatment of psychotic depression and concluded that electroconvulsive therapy (ECT) is the most effective treatment, being superior to antidepressant plus antipsychotic treatment, which is superior to antidepressant treatment alone. Novel approaches to treatment-resistant psychotic depression are summarized by Rothschild (62) and include lithium augmentation, clozapine, risperidone, sulpiride, carbamazepine, verapamil, and antiglucocorticoids. The overall outcome (in younger groups) of psychotic depression is poorer than that of nonpsychotic depression but better than that of schizoaffective disorder (63), and presumably this is also true in the geriatric population.

The initial treatment of psychotic symptoms associated with a manic episode of a bipolar illness is neuroleptic medication, with mood stabilizers such as lithium, carbamazepine, and valproic acid being the preferred choices for long-term treatment.

### *Delirium*

The biggest challenge in the treatment of psychotic symptoms in delirium is the underestimation of delirium in general by physicians (64). Delirium is a common disorder in hospitalized patients (65) and is associated with increased mortality, length of stay, and daily hospital costs. Perceptual disturbances are common, particularly visual hallucinations and misidentifications.

Prior to prescribing neuroleptics, the treating physician should minimize any medications that might be exacerbating delirium and should tailor the patient's environment to decrease misidentification and further agitation. Patients with delirium are particularly susceptible to the adverse cognitive

effects of anticholinergic toxicity, so neuroleptic treatment of associated psychosis, when absolutely necessary to the well-being of the patient, should be attempted with the least anticholinergic agents at low doses. Good choices are haloperidol, which can be given intramuscularly or intravenously, and risperidone, currently available only in oral format in Canada. Both should be initially tried at low doses starting at 0.5 mg/day. Neuroleptics should be tapered and decreased as soon as is clinically feasible.

Symptoms of delirium may not resolve completely for a longer period of time than was previously thought, so medication titration might need to be slow. Patients with delirium are also more likely than others to go on to develop dementia, which should be discussed with family members and other caregivers because it may affect treatment planning for the patient.

### *PD*

The likelihood of developing psychotic symptoms associated with PD has been found to increase with age by Friedman (66) and is most closely related to pharmacotherapy, although Birkett and others (67) noted that symptoms may also be associated with pathological processes like the presence of Lewy bodies. Visual hallucinations are the most common symptom, occurring in 20% of patients taking dopaminergic agents (68). These hallucinations may be more frequent in patients taking the specific dopaminergic agent levodopa and among patients on higher doses. Hallucinations are generally well formed, most common at night, and frequently consist of people or animals. Some patients may develop an understanding of the hallucinations, but others remain very distressed by them. The prevalence of delusions varies from 3% to 30% (68) and is generally insignificant until after 2 years of levodopa therapy (69).

This development of psychosis poses particular challenges to the clinician. The use of dopaminergic agents in late-stage PD is difficult to avoid, yet the frequently resulting psychotic symptoms can be very distressing. Dopamine-blocking agents such as the neuroleptics generally worsen mobility and tremor. Prior to the arrival of the atypical neuroleptics, classical clinical lore suggested the use of the most anticholinergic neuroleptics, such as thioridazine, which theoretically, because of the acetylcholine-dopamine imbalance in PD, should help the parkinsonian symptoms while giving some antipsychotic relief. High-potency agents (for example, haloperidol), which were known to cause more extrapyramidal side effects, were avoided. Even thioridazine can cause some extrapyramidal effects, however, and it and similar agents are more likely to cause anticholinergic delirium, worsening the hallucinosis further. Low-potency agents are also more likely to cause postural hypotension, constipation, and urinary retention. Postural hypotension is particularly important to avoid since there is a preexisting higher

prevalence of hypotension and postural instability in patients with PD that leads to an increased risk of falls and fractures. Consequently, clinicians have looked for alternative agents to use for the psychotic symptoms of PD.

Since the introduction of clozapine, there have been a number of studies looking at its use in PD. Many authors have found that clozapine is useful in PD psychosis (70–77) but that its side effects are problematic in the elderly and frequently limit its use. Worsening of parkinsonian symptoms does occur in some patients receiving clozapine treatment (78). Doses and serum levels should be lower than in patients with schizophrenia (79).

As risperidone has fewer extrapyramidal side effects than conventional neuroleptics at low doses, it is also a strong candidate (80–83) for the treatment of psychosis in PD or Lewy body dementia, although it may be less effective than clozapine (84). Also possibly useful is the new neuroleptic olanzapine, which has fewer extrapyramidal symptoms than haloperidol (85) and does not appear to carry clozapine's risk of agranulocytosis (although it does have a significant dose-related rise in hepatic transaminases). The 5-HT<sub>2</sub> receptor antagonist mianserin, found by Ikeguchi and Kuroda to be moderately or markedly effective in 8 of 12 patients with psychosis and PD (86), also has promise in the treatment of PD psychosis. The new neuroleptic sertindole, which in animal models has a strong selectivity for the limbic system and has fewer extrapyramidal side effects than haloperidol (34), might be a particularly promising alternative (87). Non-neuroleptic approaches to the treatment of psychosis in PD include the use of ondansetron (88).

My colleagues and I have recently successfully treated an elderly physician with end-stage PD and severe medication-induced psychosis with a course of bilateral ECT (generally short seizures of under 20 seconds) followed by continuation ECT every 3 weeks. Since discharge 3 months ago, his care requirements have changed from 24-hour nursing care to independent living with only weekly nursing visits. Other reports of successful ECT, with (89) or without atypical neuroleptics, for people with refractory psychosis and PD exist, suggesting that this might be an underutilized treatment. Patients with severe on-off phenomenon (90) or those who are older (91) seem to be particularly responsive to this treatment, which improves motor, cognitive, and psychiatric symptoms. Treatment response lasts for varying lengths of time, generally for a few weeks, suggesting continuation ECT as follow-up treatment. Seizure lengths are often noted to be very short.

The mechanism of action of ECT in PD is incompletely understood but seems to involve increased responsiveness to dopamine receptors (92). Pineal melatonin (93) may also play a role.

In our clinical experience, the treatment of PD psychosis remains problematic, and difficult choices must often be made between physical impairments and psychiatric symptoms. Frequently, a compromise is reached with the help of education of the patient and the family. Many patients are able to accept a certain amount of psychotic symptomatology, especially if they are able to gain insight into this as it relates to their medication.

#### *Alcohol-Related Psychotic Symptoms*

Alcohol can be a factor in the development of psychosis, both acutely and chronically. Acute alcohol withdrawal can cause alcohol-withdrawal delirium, complete with florid hallucinations and delusions. Wernicke's encephalopathy, attributable to acute thiamine deficiency, can also cause an acute delirium with cognitive, psychiatric, and physical symptoms. As delirium is more common in the elderly in general, it is important to recognize these disorders. Asaad (94) notes that alcohol hallucinosis, or auditory hallucinations that persist after acute alcohol withdrawal and occur in a state of clear consciousness, usually first presents in the 40s and is 4 times more common in males than in females. The diagnosis is usually straightforward once the alcohol use has been identified.

#### *Somatic Hallucinosis*

CBS, which is a syndrome of formed visual hallucinations in an otherwise clear consciousness, is not uncommon. Unfortunately, in spite of its stressful nature to patients, its diagnosis is often missed because affected patients frequently hesitate to volunteer a symptom that they believe will label them as "crazy." Teunisse and others (95) found a CBS prevalence of 11% among low-vision patients in an ophthalmology clinic in the Netherlands, and Brown and Murphy (96) found formed visual hallucinations in 12 out of 100 patients with macular choroidal neovascularization. Although visual impairment is the most common association (97,98), this is not always found (99). Recently Pliskin and others (100) studied 15 older adults with CBS and found neuropsychological changes indicative of early dementia, as compared with age-matched controls, so early cognitive impairment, as well as sensory deprivation (101) and social isolation (102), may be a major factor in CBS. Ball (103) has described slow-wave changes on electroencephalogram (EEG) in 3 affected patients. Adachi and others (104) speculated, based on a patient with CBS and temporal lobe atrophy, that asymmetric blood flow in the temporal lobes may be a factor leading to visual hallucinations; vascular pathology has been suggested by Ballard and Chithiramohan (105) and Ball (106). Psychiatrists working in consultation-liaison settings and with geriatric medicine units are particularly likely to encounter this fascinating but troublesome syndrome.

The first step in the treatment of CBS is the provision of information about the disorder to affected patients. This

initial step of explaining the organic pathology can be very reassuring to patients, who are often very worried that they are dementing or "crazy." Those patients who are cognitively intact may need no more intervention than this, as the condition can be self-limiting or nonprogressive. Dementing patients are more difficult to reassure and often continue to be very distressed by the images, which they interpret as real and can experience as frightening.

As the major association of CBS is bilateral visual impairment, ophthalmological referral should be made to maximize the patients' visual acuity. In a number of cases, hallucinations decrease or stop with visual improvement (98,107). Affected patients may also have organic brain disease, so a full neurologic investigation should be made. Ball (103), Hosty (108), and Bhatia and others (109) have suggested the use of carbamazepine. Environmental changes, for example, improved lighting, may decrease the hallucinations, and improvement of social isolation may also have a beneficial effect.

Treatment outcome with this syndrome is unclear from the literature. Risperidone may be more successful than other neuroleptics in treating CBS (38), but in our experience, neuroleptics are generally only partially successful at eradicating the hallucinations. Increased psychosocial support, along with visual improvement, makes the remaining symptoms more tolerable.

Musical hallucinations are occasionally encountered in a geriatric setting. These consist of tunes, with or without words, that occur repetitively in the absence of a clouded consciousness. The tunes are often ones learned in the patient's younger years and can be voluntarily changed by some (110). We have seen a number of cases, but the most persistent one was that of a hearing-impaired elderly woman who heard old forms of German hymns dating back to her childhood in a German-speaking area of Russia. Interestingly, she had not spoken German regularly for close to 60 years. All investigations, including EEG, were normal, and the patient gradually accepted the songs after discovering that she could change the hymn to another one by singing it loudly (clinical files, unpublished).

Musical hallucinations are generally most troublesome when the patient is alone, and there is no background noise. They are most often found in older women with impaired hearing (111). Some authors also report an association with depression, social isolation, EEG abnormalities, or gross central nervous system pathology such as brain tumours. Fuchs and Lauter (111) discuss interesting comparisons between CBS and musical hallucinations, finding that the latter are more likely to be continuous, familiar memories, religious, voluntarily modifiable, and associated with EEG and computerized tomography abnormalities.

The treatment of musical hallucinosis is similar to the treatment of CBS in that the improvement of hearing is paramount after the adequate education of the patient about the disorder. Because EEG abnormalities are common and other pathology, such as brain tumours, may cause this symptom, EEG and neuroradiological investigations must be performed. Improvement of hearing ability may decrease the frequency and severity of hallucinations, and increased socialization may decrease the distress. The provision of background noise for one patient of ours eradicated the hallucinations, which unfortunately recurred at night when she turned off the radio. The common cooccurrence of depression and musical hallucinosis suggests that antidepressant therapy may be beneficial. Neuroleptics may be less successful than carbamazepine (112). Again, the prognosis of this disorder is unclear from the literature.

Tactile hallucinations and delusions are not uncommon in the elderly and have been well reviewed by Berrios (113). Parasitosis, which is the delusion (or hallucination, depending on one's theoretical background) that one is infested by parasites, is a particularly challenging condition that is seen occasionally by psychiatrists, but more commonly by nonpsychiatric physicians such as dermatologists (114). Baker and others report that parasitosis most commonly presents in middle-aged women who have no history of psychiatric contact (115) and that it may be associated with subtle cognitive deterioration. Prognosis is poor in older patients and in those with a long duration of illness.

Tactile hallucinosis, particularly parasitosis, often does not respond well to pharmacotherapy (115). A variety of neuroleptics, particularly high-potency agents but also antidepressants, have occasionally been found helpful in case reports. Gallucci and Beard (116) have recently described a patient who was refractory to haloperidol and thiothixine but responded to risperidone at 6 mg/day.

## Summary

The treatment of psychosis in old age is complicated by various factors, and a full geriatric assessment is as important to elucidate the various medical contributors to psychosis as the careful choice and use of antipsychotics are to minimize debilitating side effects. Traditional neuroleptics continue to have a role in the treatment of psychosis in old age, but they must be used judiciously, at the lowest possible doses, with the awareness of possible side effects and drug interactions and with careful monitoring. The novel antipsychotics, such as clozapine and risperidone, may have a special role in sensitive patients, although because of serious limiting side effects, clozapine is not often used in the frail elderly. New agents such as olanzapine and sertindole may also have promise in the geriatric population.

### Clinical Implications

- As the population ages, clinicians will see more late-onset psychotic disorders.
- The optimal treatment of the elderly with psychotic disorders will require a closer working relationship with geriatricians and family physicians.
- The use of atypical neuroleptics will become more common, especially in frail elderly patients.

### Limitations

- Definitions of psychotic disorders in the elderly vary in the literature (that is, paraphrenia versus schizophrenia of late onset).
- Geriatric studies in the literature use widely varying age cut-offs.
- Much data regarding the use of atypical neuroleptics in the elderly are case series rather than placebo-controlled, randomized studies.

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## Résumé

**Objectif :** Examiner l'épidémiologie, la phénoménologie et le traitement des troubles psychotiques du troisième âge.

**Méthode :** La littérature portant sur les symptômes psychotiques des personnes âgées a été examinée en fonction des catégories suivantes : troubles psychotiques primaires, troubles de l'humeur, délire, maladie de Parkinson et hallucinoses somatiques (y compris le syndrome de Charles Bonnet et l'hallucinoses musicales). Les conséquences pratiques du traitement clinique font l'objet d'une discussion.

**Résultats :** La prévalence des symptômes psychotiques augmente en fonction de l'âge, surtout en raison de pathologies sous-jacentes, comme la démence, le délire et d'autres troubles neurologiques exacerbés par des déficiences sensorielles associées à l'isolement social. Le traitement au moyen des neuroleptiques classiques à doses élevées est compliqué par des symptômes extrapyramidaux, la sédation et l'hypotension orthostatique, et les effets anticholinergiques compliquent le recours à des agents classiques à faibles doses. Bien que la clozapine puisse être d'une utilité réduite en cas de résistance au traitement de la schizophrénie et de la maladie de Parkinson, elle est mal tolérée par les personnes âgées. La rispéridone est davantage utilisée dans cette population, et son profil clinique est plus favorable (à faibles doses). D'autres nouveaux neuroleptiques seront évalués de façon plus officielle chez les personnes âgées.

**Conclusion :** Au cours de la vieillesse, les troubles psychotiques comportent des associations plus « organiques » responsables de la difficulté accrue de leur traitement. Une évaluation plus poussée du recours à des agents « atypiques » est indiquée dans ce groupe de personnes âgées.