

11. Parker MJ, Prior GA. *Hip Fracture Management*. Oxford: Blackwell Scientific, 1993.
12. Craik RL. Disability following hip fracture. *Phys Ther* 1994; **74**(5): 387-398.
13. Mossey JM, Knott K, Craik R. The effects of persistent depressive symptoms on hip fracture recovery. *J Gerontol Med Sci* 1990; **45**(5): M163-M168.
14. Fox KM, Hawkes WG, Magaziner J, Zimmerman SI, Hebel RJ. Markers of failure to thrive among older hip fracture patients. *J Am Geriatr Soc* 1996; **44**: 371-376.
15. Folstein MF, Folstein SE, McHugh PR. 'Mini-mental state': A practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res* 1975; **12**: 189-198.
16. Tinetti ME, Richman D, Powell L. Falls efficacy as a measure of fear of falling. *J Gerontol Psychol Sci* 1990; **45**(6): P239-P243.
17. Voorrips LE, Ravelli ACJ, Dongelmans PCA, Deurenberg P, van Staveren WA. A physical activity questionnaire for the elderly. *Med Sci Sports Exerc* 1990; **23**: 974-979.
18. Stenhouwer S. Beck depression inventory. *Test Critiques II*. Kansas City, Mo.: Test Corporation of America, 1985; 83-87.
19. Chumlea WC, Roche AF, Steinbaugh ML. Estimating stature from knee height for persons 60 - 90 years of age. *J Am Geriatr Soc* 1985; **33**: 116-120.
20. Lohman TG, Roche AF, Martorell R, eds. *Anthropometric Standardization Reference Manual*. Champaign, Ill.: Human Kinetics Books, 1988.
21. Pollock MI, Schmidt DH, Jackson J. Measurement of cardiorespiratory fitness and body composition in the clinical setting. *Compr Ther* 1980; **6**(9): 12-27.
22. Brozek J, Grande F, Anderson JT, Keys A. Densitometric analysis of body composition: Revision of some quantitative assumptions. *Ann NY Acad Sci* 1963; **110**: 113-140.
23. Raab DM, Agre JC, McAdam M, Smith EL. Light resistance and stretching exercise in elderly women: Effect upon flexibility. *Arch Phys Med Rehabil* 1988; **69**: 268-272.
24. Kallman DA, Plato CC, Tobin JD. The role of muscle loss in age-related decline of grip strength: Cross-sectional and longitudinal perspectives. *J Gerontol Med Sci* 1990; **45**(3): 82-88.
25. Howell DC. *Fundamental Statistics for the Behavioral Sciences*. Boston, Mass.: PWS-Kent Publishing Company, 1989.
26. Crowder MJ, Hand DJ. *Analysis of Repeated Measures*. London: Chapman & Hall, 1990.
27. McArdle WD, Katch FI, Katch VL. *Essentials of Exercise Physiology*. Philadelphia: Lea & Febiger, 1994.
28. American College of Sports Medicine. *Guidelines for Exercise Testing and Prescription*. 3rd ed. Philadelphia: Lea & Febiger, 1986: 9-13.
29. Clark AN. Factors in fractures of the female femur: A clinical study of the environmental, physical, medical and preventative aspects of this injury. *Gerontol Clin* 1968; **10**: 257-270.
30. Martinsen EW, Medhus A, Sandvik L. Effects of aerobic exercise on depression: A controlled study. *BMJ* 1985; **291**: 109-114.
31. Karlsson MK, Johnell O, Nilsson BE, Serbo I, Obrant KJ. Bone mineral mass in hip fracture patients. *Bone* 1993; **14**: 161-165.
32. Going SB, Williams DP, Lohman TG, Hewitt MJ. Aging, body composition and physical activity: A review. *Journal of Aging and Physical Activity* 1994; **2**: 38-66.
33. McMurdo MD, Rennie MBA. Improvements in quadriceps strength with regular seated exercise in the institutionalised elderly. *Arch Phys Med Rehabil* 1994; **75**: 600-603.
34. Hopp JF. Effects of age and resistance training on skeletal muscle: A review. *Phys Ther* 1993; **73**(6): 361-373.
35. Fiatarone MA, O'Neill EF, Ryan ND, et al. Exercise training and nutritional supplementation for physical frailty in very elderly people. *N Engl J Med* 1994; **330**: 1769-1775.
36. Lord SR, Castell S. Physical activity program for older persons: Effect on balance, strength, neuromuscular control, and reaction time. *Arch Phys Med Rehabil* 1994; **75**: 648-652.
37. Blanpied P, Smidt GL. The difference in stiffness of the plantar flexors between young and elderly human females. *J Gerontol Med Sci* 1993; **48**(4): M58-M63.
38. Bergstrom G, Aniansson A, Bjelle A, Grimby G, Lundergren-Linquist B, Svanborg A. Functional consequences of joint impairment at age 79. *Scand J Rehabil Med* 1985; **17**: 183-190.
39. Wolfson LI, Whipple R, Derby CA, Amerman P, Nashner L. Gender differences in the balance of healthy elderly as demonstrated by dynamic posturography. *J Gerontol Med Sci* 1994; **49**(4): M160-M167.
40. Wolfson LI, Whipple R, Amerman P, Kaplan J, Kleinberg A. Gait and balance in the elderly: Two functional capacities that link sensory and motor abilities to falls. *Clin Geriatr Med* 1985; **1**(3): 649-659.
41. Woolacott MH. Age-related changes in posture and movement. *J Gerontol* 1993; **48**: 56-60.
42. Amundsen LR, DeVahl JM, Ellingham CT. Evaluation of a group exercise program for elderly women. *Phys Ther* 1989; **69**(6): 475-483.
43. Hopkins DR, Murrain B, Hoeger WWK, Rhodes RC. Effect of low-impact aerobic dance on the functional fitness of elderly women. *Gerontologist* 1990; **30**(2): 189-192.
44. Morey MC, Cowper PA, Feussner JR, et al. Evaluation of a supervised exercise program in a geriatric population. *J Am Geriatr Soc* 1989; **37**(4): 348-354.
45. McMurdo MET, Rennie L. A controlled trial of exercise by residents of old people's homes. *Age Ageing* 1993; **22**: 11-15.

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Hoarding symptoms in patients on a geriatric psychiatry inpatient unit

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Background. While collecting may be a normal behaviour, hoarding is a symptom of various psychiatric disorders, including obsessive-compulsive disorder (OCD) and obsessive-compulsive personality disorder (OCPD). Although anecdotal reports suggest that hoarding is not uncommon in geriatric psychiatry populations, its psychopathological correlates in such samples have not been well characterised.

Methods. The presence of clinically significant hoarding symptoms was screened for in 100 consecutive patients in a geriatric psychiatry inpatient unit. Both patient and collateral histories were obtained. When hoarding symptoms were present, a detailed history of their phenomenology was obtained by means of a structured questionnaire and the response of hoarding symptoms to treatment during hospitalisation was monitored.

Results. Clinically significant hoarding was found in 5/100 subjects. Four of these 5 patients met *DSM-IV* criteria for schizophrenia (paranoid subtype), with onset of symptoms coinciding with increased symptoms of dementia. The fifth patient met criteria for bipolar disorder (manic episode), also had symptoms of dementia, and had a lifelong history of hoarding. Hoarding behaviours responded to antipsychotic treatment in 3 of the 5 patients.

Conclusions. A history of hoarding may be useful in many psychiatric patients, but psychopathological correlates of this symptom are likely to vary with age. In a geriatric psychiatry inpatient population hoarding was associated not with OCD or OCPD, but rather with paranoid schizophrenia and increasing symptoms of dementia. Dopamine blockers appeared useful in decreasing hoarding in some patients, raising interesting questions about the neurobiology of this symptom.

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Hoarding has been defined as the acquisition of, and failure to discard, possessions that are useless or have limited value.¹ In contradistinction to normal collecting, hoarding may be a symptom of various psychiatric disorders including obsessive-compulsive disorder (OCD) and obsessive-compulsive personality disorder (OCPD).² Nevertheless, hoarding has received relatively little attention from researchers.³ This neglect is regrettable, as hoarding may be associated with significant morbidity,^{4,5} may have specific neurobiological and psychological correlates,^{1,3,6} and may respond to pharmacotherapy or psychotherapy.^{2,7}

It is well known that collecting is common in children.⁸ Anecdotal reports suggest, however, that hoarding may be particularly common in the elderly.⁹ While hoarding in geriatric psychiatry patients may be associated with OCD and OCPD, it is also possible that obsessive-compulsive symptoms (including hoarding) are secondary to dementia or other psychiatric disorders prevalent in this particular population. Nevertheless, to our knowledge there are few systematic reports in the literature of the prevalence, phenomenology, psychopathological correlates or treatment of hoarding in the elderly.

In this study we undertook to study symptoms of hoarding in patients from a geriatric psychiatry inpatient unit. We were particularly interested in determining the psychopathological correlates of hoarding symptoms.

Methods

One hundred consecutive patients admitted to the geriatric inpatient unit of a tertiary psychiatric hospital were screened for clinically significant symptoms of hoarding. Patients are typically admitted to this unit for control of aggressive or other externalising behavioural symptoms, or because of a need for full-time nursing. On occasion younger patients with disorders such as dementia are also admitted. Diagnoses at the unit are made in accordance with *DSM-IV* criteria.

Patients were interviewed and a collateral history was also obtained from family or long-term caretakers in all cases. Enquiries were made as to whether the patient collected excessively or had trouble throwing possessions out. Hoarding was characterised as clinically significant on the basis of the problems that it caused, e.g. marked distress, impairment in function, disruption of family routine.

When clinically significant hoarding was present, additional information about the phenomenology of these symptoms was obtained by means of a structured hoarding questionnaire (S Seedat, D J Stein — unpublished). Subjects were also assessed with the Mini-Mental State Examination (MMSE). In addition, response of hoarding symptoms to treatment received during hospitalisation was rated on the Clinical Global Impressions (CGI) change score scale.

Results

Of the 100 patients interviewed, the mean age was 67 ± 9.6 years, 45 were male and 55 female. Diagnoses comprised dementia of the Alzheimer's type (51), substance-induced persisting dementia (12), dementia due to a general medical

condition (2), vascular dementia (1), schizophrenia (14), bipolar disorder (8), major depression (8) and mental retardation (4). Fifteen of the 34 patients with schizophrenia, bipolar disorder, major depression or mental retardation also met criteria for dementia of the Alzheimer's type. None of the patients had been admitted with hoarding as a presenting problem.

A history of hoarding was obtained in 12 patients, and was determined to be clinically significant in 5 of these (mean age 65.2 ± 3.8 years, 1 man, 4 women) (Table I). In 4 of these 5 cases, subjects met *DSM-IV* criteria for schizophrenia (paranoid subtype), and onset of hoarding had begun in the context of increasing symptoms of dementia. In 1 case, the patient met diagnostic criteria for bipolar disorder (manic episode), had severe symptoms of dementia, but had hoarded throughout adulthood. None of these patients met *DSM-IV* criteria for OCD or OCPD.

Chi-square analysis indicated that the frequency of hoarding in patients with schizophrenia was higher than in patients without this disorder ($\chi^2 = 19.0$, $df = 1$, $P = 0.00001$). Fisher's exact test revealed that in patients with schizophrenia the frequency of hoarding tended to be higher in those who also had dementia of the Alzheimer's type than in those without this additional diagnosis ($P = 0.07$).

Objects hoarded by the 5 patients included papers, newspapers, magazines and old food (Table I). None of the patients had a history of collecting, e.g. stamps or coins. None of the patients hoarded bizarre objects, e.g. urine or faeces, and none clearly justified their hoarding in terms of a particular delusion. However, none of the patients was able to acknowledge that the possessions they collected were useless or of limited value and that this collecting was excessive.

All 5 patients were treated with a dopamine blocker in order to control psychotic symptoms (Table I). In 3 cases, as the psychotic symptoms improved during the course of hospitalisation, there was also a significant decrease in symptoms of hoarding. In the other 2 cases, there was continued evidence of hoarding. Unfortunately, each of the 3 responders was non-compliant with treatment after discharge, and hoarding symptoms returned once medication was discontinued.

Discussion

In a sample drawn from a geriatric psychiatry inpatient unit, clinically significant hoarding symptoms were not uncommon (5/100 patients), and these were associated with a diagnosis of paranoid schizophrenia and increased symptoms of dementia. These data are consistent with previous reports of significant hoarding in elderly patients who live in states of extreme uncleanliness and who have symptoms of psychosis or dementia.^{4,5} Therefore a history of hoarding symptoms in the elderly psychiatric patient should encourage inquiry into the presence of psychotic and dementia symptoms and, conversely, it may be useful to obtain a history of hoarding symptoms in elderly patients with these symptoms.

These findings are clearly limited by the relatively small sample size. It is likely that other diagnoses, such as OCD and OCPD, which have been associated with hoarding, are

Table 1. Geriatric psychiatry inpatients with hoarding

Age (yrs)	Sex	Main items hoarded	Diagnosis	MMSE	Pharmacotherapy	CGI
61	F	Paper rolls Boxes Old food	Bipolar disorder, dementia of the Alzheimer's type	17	Haloperidol 5 mg 3 times daily Thioridazine 100 mg nightly Tegretol 200 mg twice daily x 4 wks	2*
69	M	Paper bags Sticks Old food	Schizophrenia, paranoid dementia of the Alzheimer's type	23	Haloperidol 20 mg daily Thioridazine 200 mg daily x 4 mo.	2*
68	F	Papers Newspapers Magazines	Schizophrenia, paranoid dementia of the Alzheimer's type	24	Thioridazine 50 mg 3 times daily 200 mg nightly x 2 mo.	3†
57	F	Papers Newspapers Old food	Schizophrenia, paranoid dementia of the Alzheimer's type	24	Haloperidol 10 mg daily Thioridazine 100 mg daily x 4 mo.	2*
62	F	Papers Magazines Old food	Schizophrenia, paranoid dementia of the Alzheimer's type	22	Haloperidol 0.5 mg twice daily Thioridazine 25 mg nightly x 4 wks	3†

* Much improved.
† Minimally improved.

also present in elderly psychiatric patients with hoarding. Similarly, the findings here may not be generalisable to other samples of elderly patients or elderly psychiatric patients. For example, elderly patients with hoarding secondary to OCD are perhaps less likely to require inpatient admission than the patients included in this study. Further work with larger and more varied samples of geriatric patients is necessary if the psychopathology of hoarding in this group is to be fully elucidated.

All 5 patients with clinically significant hoarding symptoms were treated with dopamine blockers and 3 demonstrated significant improvement in both psychotic and hoarding symptoms. Although we did not employ standardised rating scales or a controlled treatment design, it is notable that discontinuation of medication after hospital discharge resulted in a return of symptoms. These results are particularly intriguing in view of preclinical data demonstrating the role of dopamine in hoarding behaviour.^{3,6} Preclinical data also indicate that the prefrontal cortex, basal ganglia and thalamus may be involved in hoarding,³ findings that are interesting in view of the role of these structures in OCD, schizophrenia and dementia.

Theories of hoarding have long emphasised psychodynamic factors^{10,11} and their role in the patients here cannot be excluded. Nevertheless, given the likelihood of neurobiological dysfunction in this sample, it is tempting to conclude with a call for further research on the neurochemistry and pharmacotherapy of hoarding. Serotonin plays a role in obsessive-compulsive symptoms, and serotonin re-uptake inhibitors may be useful in schizophrenic patients with co-morbid OCD.¹² However, preclinical data on dopaminergic mediation of hoarding, clinical data on the role of dopamine in both psychosis and OCD,¹³ and the treatment data here all suggest that further work on the role of dopamine in hoarding may be particularly valuable.

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REFERENCES

1. Frost RO, Gross RC. The hoarding of possessions. *Behav Res Ther* 1993; **31**: 367-381.
2. Greenberg D, Witztum E, Levy A. Hoarding as a psychiatric symptom. *J Clin Psychiatry* 1990; **51**: 417-421.
3. Stein DJ, Seedat S, Potocnik F. Hoarding: A review. *Isr J Relat Sci Psychiatry* (in press).
4. Macmillan D, Shaw P. Senile breakdown in standards of personal and environmental cleanliness. *BMJ* 1966; **2**: 1032-1037.
5. Snowdon J. Uncleanliness among persons seen by community health workers. *Hosp Community Psychiatry* 1987; **38**: 491-494.
6. Blundell JE, Strupp BJ, Latham CJ. Pharmacological manipulation of hoarding: Further analysis of amphetamine isomers and pimozone. *Physiol Psychol* 1977; **5**: 462-468.
7. Lane IM, Wesolowski MD, Burke WH. Teaching socially appropriate behaviour to eliminate hoarding in a brain injured adult. *J Behav Ther Exp Psychiatry* 1989; **20**: 79-82.
8. Hogstel MO. Understanding hoarding behaviors in the elderly. *Am J Nurs* 1993; **93**: 42-45.
9. Sherman M, Hertzog M, Austrian R, et al. Treasured objects in school-aged children. *Pediatrics* 1981; **68**: 379-386.
10. Abraham K. The anal character. In: *Selected Papers of Karl Abraham*. New York: Brunner/Mazel, 1979: 384-389.
11. Muensterberger W. *Collecting: An Unruly Passion: Psychological Perspectives*. Princeton, NJ: Princeton University Press, 1994.
12. Zohar J, Kaplan Z, Benjamin J. Clomipramine treatment of obsessive compulsive symptomatology in schizophrenic patients. *J Clin Psychiatry* 1993; **54**: 385-388.
13. Goodman WK, McDougle CJ, Price LH, et al. Beyond the serotonin hypothesis: a role for dopamine in some forms of obsessive compulsive disorder? *J Clin Psychiatry* 1990; **51**: suppl, 36-43.

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