Neuroleptics and Behavior: A Comparative Study

by Frieda R. Butler, PhD, RN; Louis D. Burgio, PhD; and Bernard T. Engel, PhD

Nurses need to consider probable side effects when considering recommendations for the administration of neuroleptic medications. They must also consider the influence side effects may have on efforts towards the rehabilitation of geriatric long-term care patients.

Elderly nursing home patients are often administered neuroleptic medications to control behavioral complications of dementia such as agitation and wandering. It has been reported that 37% of all medications used in nursing homes are classified as psychoactive. Although additional data need to be generated on neuroleptic drug use in nursing homes, existing surveys have reported the frequency of hypnotic use alone as between 23% and 34%. The physiological complications of prescribing neuroleptic medications to elderly patients have been clearly delineated. Age-related changes in absorption, distribution, metabolism, and elimination of these drugs render elderly patients particularly susceptible to side effects.

In spite of the widespread use of neuroleptics in nursing homes, the research basis for such use is limited. Helms recently reviewed the literature and found that only 21 studies have been conducted on the use of neuroleptics, and only three of these met adequate methodological criteria. These three studies offer mixed results on the efficacy of neuroleptics in controlling behavior problems. Moreover, none of the studies employed objective observational techniques nor did they examine the specific effects of the medication on adaptive functional behavior.

The purpose of the present study was to employ objective observational methods to examine differences in behavior between a group of patients routinely receiving clinically significant doses of neuroleptic medication with a matched group not receiving medication.

Methods
The study was conducted at a 210-bed urban nursing home. The facility
included a chronic nursing care unit; however, all patients included in this study were classified as intermediate or skilled nursing patients. A survey was conducted of patients in the nursing home who were diagnosed as demented.

Thirty patients were randomly assigned to the medication group if they were receiving a routine, clinically effective dose of neuroleptic medication. The minimal dosage of each neuroleptic medication considered to be clinically effective for the elderly was obtained from the literature.10 Table 1 lists the mean dosage, range, and number of patients receiving the various medications.

Thirty demented patients matched for age, mini-mental state score (range = 0-30),11 and scores on the Manifest Psychosis Factor of the Nurses’ Observational Scale for Inpatient Evaluation (NOSIE),12 were placed in the no-drug group. Matched patients were placed in the no-drug group if they were not currently receiving neuroleptic medication and if they had not received neuroleptic medication for at least one month prior to initiation of the study.

Patients were matched on Manifest Psychosis Factor scores so that differences in behaviors could not be attributed to group differences in psychotic symptomatology. The range of scores on this factor was 0-24, and the mean scores for both groups were within the range of scores obtained by a normative group of institutionalized chronic schizophrenics.12 Table 2 shows the demographic characteristics of the two groups and their scores on matching variables. Chi-square or t-tests were conducted on these demographics and matching variables. There were no differences between the groups on any of these variables.

Additional psychoactive medications (eg, triazolam) were administered to patients in both groups on occasion (PRN). However, the rate of administration was similar in both groups. Patients were eliminated from both groups due to death or transfers, resulting in a final N of 24 per group.

**Assessments**

**Activities of Daily Living (ADL)—**The Barthel Index for activities of daily living13 was administered to the primary nurse of each of the 48 subjects. The nurse rated the patients’ ability to provide self-care on ten dimensions. The range of scores on the Barthel is 0-100.

**Behavior Problem Checklist—**An interview was conducted with each patient’s primary nurse to assess the occurrence of significant behavior problems. A list of 21 behavior problems and their behavioral definitions was presented to the primary nurse who was asked to indicate if the problem was currently displayed by the patient. An affirmative reply indicated that the behavior problem was displayed by the patient at a frequency and intensity considered problematic for the staff.

**Medical Record Review—**The medical record was reviewed by the first author for a period of six months prior to the initiation of the study. The experimenter recorded the rate of falls and the
patient's attendance at physical, occupational, and recreational activities.

Physical Symptoms—A list of 18 physical symptoms associated with the administration of neuroleptic medication was generated along with behavioral definitions for each symptom. The primary nurse was asked to review these symptoms and their definitions daily for 30 days, and record whether the patient displayed the symptom at any time during the day. These data were collected for both the medication and the no-medication groups.

Behavioral Observations—Objective behavioral observations of patient mobility (walking, wheelchair use, in-bed), daytime sleeping, social interaction, and chair restraint were collected daily by the first author for each patient over ten days. Each patient was observed for five minutes per day with a continuous ten-second interval time-sampling procedure (i.e., the occurrence or nonoccurrence of each behavior was recorded for each ten-second interval for five minutes), for a total of 50 minutes of observation per patient. The time of observation was alternated daily between mornings and afternoons. Interobserver agreement was established by having two observers simultaneously but independently collect data prior to the initiation of the study. Formal observations were not conducted until observers reached 80% agreement or above on all behavioral categories.

Grip strength—Grip strength of the preferred hand was assessed four times for all patients over a two-week period. Patients were asked to squeeze a cylindrically wrapped sphygmomanometer as tightly as possible in the manner described by Williams and Hornberger. The four recordings were averaged to yield a summary measure for all subjects.

Results

Activities of Daily Living (ADL)—The medication group obtained a mean score of 35.41 on the Barthel Index versus a mean score of 35.00 for the no-drug group. A t-test was conducted on the means and the t was found to be nonsignificant (t = .04, p > .05). Thus, there were no differences between the two groups in their overall level of ADLs.

Behavior Problem Checklist—Table 3 includes the number and percent of patients in the drug and no-drug groups displaying various behavior problems. Chi-square analyses were performed on the 21 behavior problems identified on the Behavior Problem Checklist. Seven of the behavior problems were reported more frequently for patients in the medication group. Behavior problems significant at p < .001: aggression and bedtime problems; significant at p < .01: disruption; significant at p < .05: noncompliance, verbal abuse, and aberrantly high activity level.

Medical Record Review—Chi-square analyses were performed on the number of falls and attendance at activities as documented in the medical record. There were no significant differences between groups on these measures.

Physical Symptoms—A t-test was conducted comparing the mean number of physical symptoms per patient, per day in the medication (mean = 1.86) and no-medication (mean = 1.27) groups. Patients in the medication group were more likely to experience physical symptoms associated with the administration of neuroleptic medications (t = 18.24, p < .001).

The physical symptoms were then separated into four categories: CNS/motor (e.g., drowsiness, restlessness), gastro-intestinal (diarrhea, constipation), genito-urinary (urinary frequency), and dermatological (itching). A Chi-square analysis was conducted on the number of patients in each group showing at least one occurrence of these
TABLE 4

Number and Percent of Patients Per Group Displaying Physical Symptoms Associated With the Administration of Neuroleptic Medication by Major Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Medication Group</th>
<th>No-Medication Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNS/motor</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td></td>
<td>24 (100)</td>
<td>15 (62)*</td>
</tr>
<tr>
<td>Gastro-intestinal</td>
<td>9 (36)</td>
<td>3 (12)*</td>
</tr>
<tr>
<td>Genito-urinary</td>
<td>17 (17)</td>
<td>15 (62)</td>
</tr>
<tr>
<td>Dermatological</td>
<td>1 (4)</td>
<td>5 (21)</td>
</tr>
</tbody>
</table>

*Significantly fewer than in the medication group (p<0.001)

Physical symptoms over a 30-day period. The results of this analysis (Table 4) show that the patients in the drug group were more likely to experience physical symptoms associated with the CNS/motor and GI systems.

**Behavioral Observations**—The observational data were converted to mean percent of ten-second intervals in which the behaviors occurred. T-tests were conducted on the six categories of behavior. Patients in the medication group were more likely to be observed sleeping (mean=29.22%) than patients in the no-medication group (mean=18.51%, t=1.71, p<.05). Fifty-eight percent of all study patients were regularly found to be in restraints; however, there were no differences between groups in the use of restraints, mobility, time spent in bed, or social interaction.

**Grip Strength**—The mean grip strength for patients in the no-medication group was 54.91 mm of mercury, and 33.58 mm of mercury for the medication group. A t-test showed this difference to be significant (t=2.18, p<.05).

**Discussion**

The results of this study suggest that elderly nursing home patients matched on cognitive ability, age, and symptoms of psychosis, but differing on whether they received regular doses of neuroleptic medications, displayed strikingly different behavioral patterns.

Nursing staff reported that in spite of receiving clinically significant doses of neuroleptic medications, patients still displayed significantly more behavior problems than patients in the no-medication group. The patients in the medication group tended to engage in behaviors thought to be noxious to staff, including aggression, verbal abuse, disruption, and noncompliance. It can be inferred from these results that elderly patients who act out are more likely to receive neuroleptic medication; however, these results also call into question the efficacy of these medications in controlling behavior problems.

In addition to displaying significantly more problematic behaviors, nursing staff reported that patients in the medication group were more likely to display an aberrantly high activity level. Yet, direct observations indicated that these patients were also more likely to be found sleeping on the wards. Although initially these results may appear contradictory, it should be noted that the literature lists both sedation and akathisia as potential adverse reactions to the neuroleptics. Additional research is needed to examine the prevalence of these adverse reactions in elderly patients.

Our objective and detailed physical-symptoms assessment demonstrates that elderly patients receiving neuroleptics display more behaviors associated with adverse side effects of these medications, and these side effects cluster in the CNS/motor and GI systems.

Nurses need to consider these probable side effects when considering a recommendation for the administration of neuroleptic medications. One must also consider the influence side effects such as impaired attention, fatigue, and muscle weakness may have on efforts towards the rehabilitation of geriatric long-term care patients. These side effects can affect a patient's ability and motivation to relearn the complex skills required for his or her return to the community.

Unfortunately, the ex post facto design used in this study does not allow us to make inferences of causality. For example, although medicated patients displayed a higher rate of behavior problems, it is possible that before the initiation of drug therapy their behavior problems may have been more severe or may have occurred even more frequently. Controlled, prospective intervention studies are needed to firmly establish the effects of neuroleptic medication on behavioral excesses and adaptive behaviors in the elderly.

Considerable research has been conducted examining the effects of these medications on problem and adaptive behaviors in nonelderly clinical populations such as the mentally retarded. This research suggests that the neuroleptics are not generally effective in controlling behavior problems, or that the dosages needed to suppress problem behaviors also suppress many adaptive behaviors. Studies which have compared the effects of drug therapy and behavior therapy often have found the latter to be superior without suppression of adaptive functioning. Other studies have found a combination of low dose neuroleptic and behavior therapy to be most beneficial. Research is needed to examine similar strategies with elderly patients who display aberrant behaviors.

**References**


---

### About the authors

**Frieda Butler** is associate professor of nursing and nurse researcher at the Howard University College of Nursing in Washington, DC. **Louis Burgio** is a research psychologist with the Gerontology Research Center in Baltimore and is the associate director of the Geriatric Inpatient Continence Program, co-sponsored by NIA and ACRA. **Bernard Engel** is chief, Laboratory of Behavioral Sciences, Gerontology Research Center.

---

**Neuroleptic Medications**

**KEY POINTS**

**Butler F, Burgio L**


1. Two matched groups of demented nursing home patients, one receiving regular neuroleptic medications and one not receiving these medications, were compared on a number of behavioral measures.

2. Investigators assessed activities of daily living, the occurrence of behavior problems, physical symptoms, mobility, social interaction, daytime sleeping, grip strength, falls, and attendance at activities.

3. Results indicate that patients receiving neuroleptic medications displayed significantly more behavioral excesses, less grip strength, higher rates of CNS/motor and GI physical symptoms, and were more likely to be observed sleeping on the units than patients not receiving medication.

4. Investigators determined a need for more controlled intervention studies, and behavioral interventions were suggested as alternatives or supplements to drug therapy.

---

*Journal of Gerontological Nursing* Vol. 13, No. 6