Comparison of Discharge Rates and Drug Costs for Patients With Schizophrenia Treated With Risperidone or Olanzapine

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This study compared the discharge rates and drug costs of 789 patients with schizophrenia or schizoaffective disorder who began pharmacotherapy with olanzapine or risperidone between July 1997 and June 1998. Discharge rates 30 days after the start of treatment were 45 percent for the patients treated with risperidone and 32 percent for those treated with olanzapine (p=.001). Daily drug costs during the same period were $6.42 for risperidone and $12.29 for olanzapine (p<.001). For risperidone, lower dosages were associated with higher hospital discharge rates, whereas no significant association was observed for olanzapine. These data suggest that among inpatients with schizophrenia or schizoaffective disorder, use of risperidone results in a higher discharge rate and a lower drug cost than use of olanzapine. (*Psychiatric Services* 52:676–678, 2001)

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Safety and efficacy are the primary considerations in selection of antipsychotic medications. However, medication costs and other costs are also important. Treatment of schizophrenia accounts for about 2.5 percent of total national health care expenditures, or more than $32.5 billion annually (1). Compared with conventional agents, atypical antipsychotics offer many benefits, including lower rates of extrapyramidal adverse effects such as tardive dyskinesia and improvements in cognition and negative symptoms (2). However, the pricing of these novel agents constitutes a deterrent to their routine use.

The common use of two atypical antipsychotic medications—risperidone and olanzapine—is contributing to escalating institutional pharmacy budgets. Therapy with risperidone may be more cost-effective than therapy with traditional antipsychotics, primarily through its effect of reducing the number of inpatient hospital days (3,4). Olanzapine also may offer economic benefits compared with traditional medications (5). So far, few studies have focused on outcomes and economic differences between these two medications.

The overall efficacy of risperidone and olanzapine in two double-blind trials was found to be comparable among patients with schizophrenia and other psychotic disorders (6,7). However, no large naturalistic, real-world studies have examined differences in effectiveness or outcomes between the medications. Although naturalistic studies do not provide response rates in terms of standard rating scales, they do allow for the examination of outcome measures as seen in typical treatment settings. Our study examined the real-world use of risperidone and olanzapine, evaluated the differences in discharge rates and dosages between the medications, and addressed the cost differential between the drugs as they are being used in the state of Maryland.

Methods

The database used for our analysis was designed to prospectively evaluate use and dosage of atypical antipsychotics in Maryland state psychiatric inpatient facilities. All patients who started therapy with risperidone or olanzapine in six facilities were included. To classify appropriate diagnoses, chart reviews were performed by two members of the research team to verify the most recent diagnoses according to *DSM-IV* criteria.

The period for analysis was July 1,

1997, through June 30, 1998. Risperidone has been used in the state system since April 1994 and olanzapine since October 1996. Medication costs were determined from the actual prescribed regimens for each patient. Prices are negotiated by a large pharmaceutical buying group that represented 31 states and 1,850 facilities during the study period. These prices are believed to be more representative of actual expenditures by institutions than is the average wholesale price.

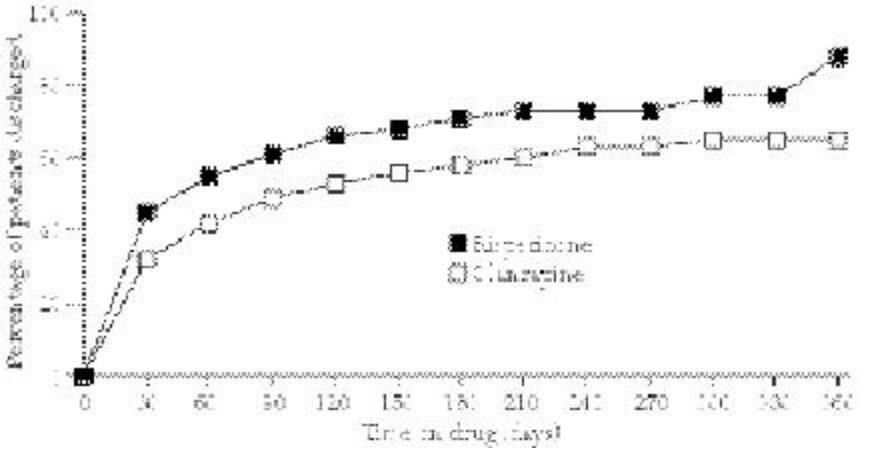
Student's t tests were used to analyze mean dosages, costs, and demographic variables between the two groups. To determine the discharge rate 30 days after the start of treatment, time to discharge was measured by product-limit (Kaplan-Meier) survival analysis. Statistical significance was measured by the log-rank chi square test. A log-normal regression model was used to determine variables highly predictive of discharge, such as age, sex, race, number of previous hospitalizations, and dosage. All tests were two-tailed, and the significance level was set at .05 or less.

Results

Between July 1, 1997, and June 30, 1998, a total of 398 patients started treatment with olanzapine and 391 patients started treatment with risperidone. A total of 377 of the patients treated with olanzapine and 367 of those treated with risperidone were evaluable for race comparisons—that is, there was sufficient information in the patient's chart to enable such comparisons. Of these, 239, or 63 percent, of those taking olanzapine and 206, or 56 percent, of those taking risperidone were Caucasian (χ^2=4.08, df=1, p=.043). The mean± SD age of the patients in the olanzapine group was 42.96±13.03 years, compared with 41.79±13.32 years for those in the risperidone group; the difference was not significant. A total of 393 patients taking olanzapine and 379 patients taking risperidone were evaluable for gender comparisons. Of these, 226, or 58 percent, of those taking olanzapine and 243, or 64 percent, of those taking risperidone were men (χ^2=3.54, df=1, p=.06).

Figure 1

Time to hospital discharge among 391 patients treated with risperidone and 398 patients treated with olanzapine[1]



[1] Log-rank χ^2=10.82, df=1, p=.001

For comparisons of patients in each drug group who had had a previous trial with the other drug, 193 patients who started treatment with olanzapine and 175 patients who started treatment with risperidone were evaluable—that is, information on previous trials was available for these patients. Of these patients, 42 in the olanzapine group, or 22 percent, had had a previous trial of risperidone and 30 in the risperidone group, or 17 percent, had had prior olanzapine treatment. The difference between the groups was not significant. The mean number of previous hospitalizations since the availability of atypical antipsychotics was 1.25±.50 for the patients in the olanzapine group and 1.21±.51 for the patients in the risperidone group. The mean dosages were 4.8±2.7 mg a day for risperidone and 17.5±7.3 mg a day for olanzapine. The mean daily cost of the drugs was $6.42 for risperidone and $12.29 for olanzapine (t=18.57, df=701, p<.001).

Discharge rates 30 days after the start of treatment were significantly different between the patients treated with risperidone and those treated with olanzapine (log-rank χ^2=10.82, df=1, p=.001) (Figure 1). Discharge rates were 45 percent (95 percent confidence interval=39 to 52 percent) in the risperidone group and 32 percent (CI=26 to 38 percent) in the olanzapine group 30 days after the initiation of treatment. Younger age was predictive of discharge in both the olanzapine group (χ^2=6.47, df=1, p=.011) and the risperidone group (χ^2=29.61, df=1, p<.001). Lower dosages of risperidone were associated with a greater likelihood of discharge (χ^2=10.98, df=1, p<.001). No significant association between discharge and dosage was seen for olanzapine. There was no association between discharge and race or sex for either medication.

Discussion and conclusions

We found that risperidone was associated with higher 30-day discharge rates than olanzapine over a one-year period. Age, sex, race, number of previous hospitalizations, and whether the patient had had previous trials with atypical drugs were largely comparable between groups and did not account for the difference in discharge rates by regression analysis. Additionally, the average drug costs of risperidone were about half those of olanzapine, a cost difference of more than $2,100 per patient annually.

Other researchers have found similar medication cost savings and favorable outcomes with risperidone compared with olanzapine. Nasrallah and colleagues (8) found similar lengths of stay and response rates with the two drugs, but lower drug costs with risperidone. Likewise, Procyshyn and Zerjav (9) found that daily drug costs were lower with risperidone, whereas

discharge and response rates were higher.

The differences in discharge rates in our study could have been explained if one group had consisted of more chronic patients than the other; however, this was not the case. Although measures of symptom severity were not available, proxy measures of chronicity, such as number of previous hospitalizations and whether the patient had had previous trials of atypical agents, were similar between the two groups. Younger age was associated with better outcomes in both groups, yet there were no significant differences in age, which would have contributed to differences in discharge rates.

Lower risperidone dosages were associated with higher discharge rates, whereas olanzapine dosage was not associated with outcome. This finding was not unexpected—there is much evidence that lower dosages of risperidone are more effective than higher dosages (7,10). This phenomenon does not occur with olanzapine, for which dosages have gravitated upward since the drug's introduction. Moreover, no dosage differences among inpatient facilities contributed to the differences in discharge rates. Because the most effective dosage of olanzapine has yet to be determined, drug trials may be more difficult to optimize with olanzapine than with risperidone.

Although this study lacked some of the benefits of a prospective, double-blind clinical trial, the naturalistic design had its own advantages. The results of the study reflect the real-world use of the two drugs. Practitioners prescribed either risperidone or olanzapine and discharged patients on the basis of their clinical judgment. These practitioners were unaware of the study and were not subject to inherent biases. However, other costs—such as outpatient services, emergency department visits, concomitant therapies, and rehospitalization—were not addressed, which was a limitation of our study.

Our data suggest that risperidone offers a higher discharge rate at a lower drug cost compared with olanzapine among inpatients with schizophrenia. Olanzapine's higher cost could be justified if it was associated with higher discharge rates, but this was not the case in our population. Nevertheless, other studies are needed to verify our findings, to compare the naturalistic use of these medications in first-break patients or outpatients, and to rule out regional differences. Additionally, rigorous pharmacoeconomic analyses should be undertaken to compare other contributing factors to overall costs of care. ♦

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Submissions to the journal's Datapoints column are invited. Areas of interest include diagnosis and practice patterns, treatment modalities, treatment sites, patient characteristics, and payment sources. National data are preferred. The text ranges from 350 to 500 words, depending on the size and number of figures used. The text should include a short description of the research question, the database and methods used, and any limitations of the study.

Inquiries or submissions should be directed to Harold Alan Pincus, M.D., or Terri L. Tanielian, M.S., editors of the column. Contact Ms. Tanielian at Rand, 1200 South Hayes Street, Arlington, Virginia 22202 (terri_tanielian@rand.org).