Does Family-Based Treatment Reduce the Need for Hospitalization in Adolescent Anorexia Nervosa?

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ABSTRACT

Objective: We examined the timing and number of days of hospitalization during the course of treatment, hospitalization effects on outcome, and predictors and moderators of the use of hospitalization in adolescents with anorexia nervosa (AN).

Method: Data used in this study were collected from 158 adolescents (ages 12 to 18 years of age) who met DSM-IVTR criteria for AN (exclusive of the amenorrhea criteria) randomized to receive either Family Based Treatment (FBT) or Systemic Family Therapy (SyFT) in a 7 site study.

Results: The trajectory of hospital day use is similar in the first 5 weeks irrespective of treatment allocation. However, days of hospitalization continued to increase throughout SyFT but leveled off in FBT after ~5 weeks of treatment. Early hospitalization was a negative predictor for improvements in percent weight change for both treatment groups ($t(19)=2.6, p = 0.011$). Co-morbid psychopathology predicted early hospital use in both treatments. Higher levels of eating related obsessions and depression moderated hospitalization rates suggesting that FBT reduces early hospitalization rates compared to SyFT for these subgroups.

Discussion: These data support and extend findings from previous studies by identifying patterns of hospital use, and predictors and moderators of treatment effect for early hospitalization use in adolescent AN. © 2016 Wiley Periodicals, Inc.

Keywords: anorexia nervosa; hospitalization; adolescents; family therapy

Introduction

The cost of treatment for adolescent anorexia nervosa (AN) is relatively high for a psychiatric disorder; the main cause of this high cost being the use of hospitalization.1 Although a number of studies suggest that inpatient treatment is effective at promoting weight gain in the short-term, long term benefits have not been demonstrated.2 Two studies suggest that Family Based Treatment (FBT) is a specific form of family therapy that reduces the use of hospitalization in adolescent AN. Lock et al.3 found that significantly fewer adolescents who were treated with FBT were hospitalized than those who received individual therapy. Similarly Agras et al. found participants who received FBT gained weight significantly more quickly in treatment and used fewer hospital days than those who received Systemic Family Therapy (SyFT).4 The purpose of the current exploratory study is to shed further light on hospitalization use by adolescent AN patients during treatment by examining the process of hospitalization in the above study5 that compared FBT to SyST to describe patterns of hospital use, hospital effects on outcome, and predictors and moderators of hospitalization.

Method

The study was conducted between September 2005 and April 2012 and involved a randomized parallel comparison of FBT and SyFT. The study was approved by the...
Institutional Review Board at each site. After describing the study to the participating families, written informed consent was obtained from the parents and an assent from the adolescent. Details describing this study’s protocol and primary outcomes are available elsewhere. For this study we examined the hospitalization data for each of the participants together with relevant baseline data. Medical and psychiatric hospitalization admission and discharge decisions were made by clinicians blind to the treatment randomization of participants. Medical hospitalizations, the main type utilized in this study, were based on guidelines by the Society of Adolescent Medicine for the inpatient treatment of adolescents with anorexia nervosa.

Measures

The following measures were used in this study:

1. Hospital days for individuals and by treatment including both medical and psychiatric hospitalizations.
2. Timing (by weeks of treatment) of hospital usage. Hospitalizations were divided into early (during the first 5-weeks of treatment) and late (after 5-weeks of treatment) based on examination of the data.
3. Weight defined as percent mean body weight for age, height and gender using CDC norms.
4. Attrition was defined as either dropping out of treatment or the study.

Other secondary outcome measures used were the Eating Disorder Examination (EDE), Yale-Brown-Cornell-Eating Disorder Scale (YBC-ED), Rosenberg Self-Esteem Scale (RSE), Beck Depression Inventory (BDI), Child-Yale–Brown Obsessive Compulsive Scale (CY-BOCS), Kiddie-Schedule for Affective Disorders and Schizophrenia KSADS, Multidimensional Perfections Scale (MPS) as described in the original article. For purposes of this study only baseline measures were used as potential predictors or moderators of hospitalization.

Statistical Analysis

Because the hospital data were not normally distributed, nonparametric statistics were used as appropriate. Analyses were conducted in line with the intent-to-treat principle. The timing of hospitalization and use of hospital days between the two treatments was investigated by plotting the variables and examining the effects on hospitalization by treatment group. We also examined the effect of hospitalization on dropout from treatment and on clinical outcome. In addition, we examined all baseline variables as potential moderators of treatment assignment effect on early hospitalization in line with the McArthur approach. We used logistic regression analysis for our investigation of moderators and non-specific predictors of early hospitalization. In this exploratory analysis we relaxed the significance level (alpha = .10) to allow detection of potential moderators in this relatively small sample.

Results

Participants

Data used in this study were collected from 158 (78 in FBT, 80 in SyFT) adolescents (ages 12 to 18 years of age) who met DSM-IVTR criteria for AN (exclusive of the amenorrhea criteria). The mean age of participants was 15.3 (1.8) years, 89.2% were female, the average duration of AN was 13.5 (13.9) months. Full details of participant characteristics and the study protocol are available elsewhere. As reported in the original article there were no differences between groups for any demographic or baseline variable. There were also no statistically significant differences between treatments for percent ideal body weight, eating disorder symptoms, or comorbid psychiatric disorders at either end of treatment or 1 year follow-up.

Pattern of Hospitalization Use

Figure 1 illustrates two distinct patterns of hospital use during treatment based on treatment assignment (FBT = 12; SyFT = 15). Most hospitalizations (73%) occurred in the first 5 weeks of treatment (early hospitalization). The median number in days for those hospitalized early for FBT was 7 (Interquartile Range = 20) compared with 23 for SyFT (Interquartile Range = 21), Mann-Whitney U = 28.5, \( p = 0.018 \). While hospitalizations continued throughout treatment in SyFT, there were few later hospitalizations (after 5 weeks of treatment) for FBT. For FBT 2 patients (16.6% of early hospitalizations) were rehospitalized after the first 5-weeks of treatment and for SyFT 6 patients (40%) were rehospitalized, accounting for a total of 6 rehospitalizations for FBT and 13 for SyFT because of multiple hospitalizations per patient. The total number of hospital days used in SyFT was 655 and 369 in FBT. As noted previously the median number of days per hospitalization was 21.0 for SyFT and 8.3 for FBT, Mann-Whitney U = 51.0, \( p = 0.02 \). Although not statistically significant, weight gain differed between groups during the first 4-weeks of treatment for those hospitalized early (9.0 lbs for FBT and 0.2 lbs for SyFT).
Effects of Early Hospitalization on Outcomes

There was no effect of early hospitalization on treatment attrition or later hospitalization during the treatment period. However, early hospitalization was a negative predictor (see Table 1) for the percent weight change for both treatment groups.

Participant Characteristics Predictive of Early Hospitalization

In line with our original article,10 we examined 16 baseline variables as potential moderators of treatment effect on early hospitalization. None of these variables were identified as moderators using our a priori significance level of alpha = 0.05 (two-tailed), but six variables were found to be nonspecific predictors of early hospitalization (see Table 1 for descriptive data). That is, regardless of the treatment assignment status (i.e., FBT vs. SyFT), participants with lower baseline scores on the BDI, YBC-ED, MPI, or RSE and lower baseline rates of compensatory behavior and comorbidity were less likely to be hospitalized. Given the possibility of Type 2 error in the moderator analysis in this small sample, we relaxed the Type 1 error rate (i.e., change the alpha from 0.05 to 0.10). In this exploratory analysis, we identified two potential moderators of treatment effect: baseline BDI (p = 0.094) and YBC-ED (p = 0.078). The YBC-ED score has been previously identified as a moderator of treatment effect in studies of FBT on recovery rates.3,16 If these moderators were confirmed in a larger sample of hospitalized patients, this would suggest that FBT decreases early hospitalization specifically for individuals with higher baseline BDI and YBC-ED scores.

Discussion

The current study extends findings from previous studies related to FBT effects on hospitalization by illustrating the difference in timing of hospitalization with FBT compared to SyST (see Fig. 1). When hospitalization occurs in FBT, it occurs early then levels off; whereas in SyFT hospitalization rates not only occur early but continue to increase throughout treatment. These differences in hospitalization patterns are likely the result of greater weight gain early in FBT4 compared to SyFT. Early weight gain during the first 5 weeks of treatment is protective of later hospitalization because it decreases vulnerability to medical instability. Regardless of treatment allocation, hospitalization during treatment was predicted by the presence of obsessive-compulsive symptoms related to eating (i.e., YBC-ED), lower self-esteem, higher perfectionism, depressive symptoms, and greater psychiatric comorbidity. Because the importance of identifying moderators of treatment effect is high15 and the rarity of even moderately large samples of adolescents with AN in treatment studies, we relaxed our significance level to alpha = 0.10 in a highly exploratory hypothesis generating analysis. This yielded two potential moderators: YBC-ED and BDI.

![FIGURE 1 Cumulative hospital days over time and by treatment. FBT (family-based treatment) SyFT (systemic family therapy). [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

TABLE 1. Predictors of early hospitalization

<table>
<thead>
<tr>
<th>Variable</th>
<th>Early Hospitalization (n = 25) (means and standard deviations)</th>
<th>No Early Hospitalization (N = 133) (means and standard deviations)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage weight change at end of treatment</td>
<td>86.14 (10.94)</td>
<td>91.15 (7.92)</td>
<td>t1 = 2.6, p = 0.011</td>
</tr>
<tr>
<td>Beck Depression Inventory</td>
<td>22.16 (10.17)</td>
<td>13.36 (8.07)</td>
<td>p = 0.001</td>
</tr>
<tr>
<td>Yale-Brown-Cornell eating disorder score at baseline</td>
<td>14.48 (8.30)</td>
<td>10.95 (8.07)</td>
<td>p = 0.021</td>
</tr>
<tr>
<td>Frequency of compensatory behaviors at baseline</td>
<td>16% (64%)</td>
<td>54% (41%)</td>
<td>p = 0.024</td>
</tr>
<tr>
<td>Percent co-morbid disorders at baseline</td>
<td>17% (68%)</td>
<td>36 (27%)</td>
<td>p = 0.003</td>
</tr>
<tr>
<td>Multidimensional Perfectionism scale</td>
<td>110.4 (22.06)</td>
<td>100.25 (19.85)</td>
<td>p = 0.009</td>
</tr>
<tr>
<td>Rosenberg Self-Esteem Scale at baseline</td>
<td>27.16 (6.20)</td>
<td>22.7 (6.00)</td>
<td>p = 0.007</td>
</tr>
</tbody>
</table>
Importantly, higher scores on the YBC-ED has been found to moderate clinical outcome (i.e., recovery) in other studies of adolescent AN. These exploratory findings are potentially important in developing hypotheses to be tested in future confirmatory studies.

There are significant limitations to the findings of this study. The sample size of hospitalized participants is relatively small and data were collected from hospital charts, discharge letters, and self-reports rather than from a systematic data base. The sample used in the moderator analysis is likely too small to rule out Type 2 error and therefore there may be moderators which were not able to be identified in this sample despite relaxing the significance level (Type 1 error rate) for this analysis. The results should be considered primarily applicable to settings that use similar medical criteria for hospitalization as those used in this study. Nonetheless, health planners looking to contain costs while providing an effective treatment for adolescents with AN should consider supporting the training and implementation of FBT for this population.

References