Effects of rational-emotive therapy on adherence to fluid restrictions of patients maintained on hemodialysis prior to and after kidney transplantation**

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Abstract

BACKGROUND: Non-adherence to fluid restrictions is common in patients maintained on hemodialysis prior to and after kidney transplantation, which has a profound influence on the development and transfer of illness of the patients. Mental factors have great influences on adherence to fluid restrictions.

OBJECTIVE: To investigate the effects of rational-emotive therapy on adherence to fluid restrictions of patients maintained on hemodialysis prior to and after kidney transplantation.

METHODS: In total 108 patients maintained on hemodialysis were randomly assigned to an intervention group (n = 50) and a control group (n = 50). The control group received the conventional therapy. At the same time, the intervention group received the conventional therapy combined with rational-emotive therapy. All cases were assessed with the Symptom Checklist 90 (SCL-90) and Medical Coping Modes Questionnaire (MCMQ) prior to and after intervention. Clinical indices related to adherence to fluid restrictions were measured three successive times and the average score of each index was calculated.

RESULTS AND CONCLUSION: Forty-eight patients from the intervention group and 44 patients from the control group accomplished the study. After intervention, the scores of the two subscales, confrontation and avoidance, were significantly higher than those in the control group (P < 0.05). However, some scores were significantly lower than those in the control group, including the score of acceptance/resignation subscale of MCMQ, total average score of SCL-90, the score of somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety and additional items, and the score of four clinical indices related to adherence to fluid restrictions (the ratio of interdialysis weight gain to dry weight, mean systolic blood pressure, mean diastolic blood pressure, and mean ultrafiltration volume prior to hemodialysis) (P < 0.05). All these findings suggest that rational-emotive therapy can effectively amend the coping modes and the mental states of the patients, and then improve their adherence to fluid restrictions.

INTRODUCTION

Kidney transplantation is the most effective method of treating end-stage renal disease. Hemodialysis should be a necessary therapy for patients awaiting kidney transplantation. Some patients who received allogenic kidney transplantation still require hemodialysis due to anuria caused by acute tubular necrosis and severe acute rejection. End-stage renal disease patients who undergo hemodialysis over a 3-month period are clinically called maintenance hemodialysis (MHD) patients. Hemodialysis is an incomplete renal replacement therapy, and its therapeutic effects and transfer of illness depend, to a large extent, on the treatment compliance of patients[1-2]. MHD patients generally lack of treatment compliance[3-4]. Adherence to fluid restrictions is most difficult[5-6], and low mental health and strong negative emotion caused by low mental health is one of independent predictive factors[6-7]. Rational-emotive therapy, developed by American psychologist Albert Ellis, helps to uncover irrational beliefs, change passive coping modes, and thereby improve poor emotions and behaviors. This study attempted to investigate the effects of rational-emotive therapy on adherence to fluid restrictions, hopefully providing reference for clinical treatments.

SUBJECTS AND METHODS

DESIGN

A randomized, controlled observation.

TIME AND SETTING

This study was performed at the Hemodialysis Center, Affiliated Hospital of Guangdong Medical College from July 2009 to September 2009.

SUBJECTS

Patients maintained on hemodialysis who received treatment in the Affiliated Hospital of Guangdong Medical College prior to July 10th, 2009, were included in this study. Prior to grouping, patients were screened by the Symptom Checklist 90 (SCL-90)[8], Medical Coping Modes Questionnaire (MCMQ)[9], and Wechsler Adult Intelligence Scale-Revised for China (WAIS-RC)[8] and confirmed by psychiatrists with a professional title of associate chief physician or above. Inclusion criteria: (1) end-stage renal disease patients who received over 3 months of hemodialysis, with stable disease condition, no infection or hemorrhage. (2) Patients receiving hemodialysis twice or three times, 4.0-5.0 hours once. (3) With clear consciousness, no psychiatric history or personality disorder, with normal intelligence. (4) Have received education to some extent, and able to understand investigated items. (5) Cooperate voluntarily; all patients signed informed consent. This study was approved by the Hospital Ethics Committee of Guangdong Medical College and Zhanjiang Medical Ethics Committee.

In total 102 patients met the inclusion criteria, but 2 patients refused to participate in this study, so finally 100 patients were included. The included patients were numbered and randomly divided into an intervention group (n = 50) and a control group (n = 50).
## Methods

During 3-month experimentation, the control group received routine hemodialysis, and the intervention group received rational-emotive therapy in addition to hemodialysis. Prior to intervention, patients and their relatives were informed of the principle, effects, and announcements of rational-emotive therapy to establish a good doctor-patient relationship.

### Precise procedures

First, explanation of basic knowledge regarding psychological health, including (1) generality of emotion (concept of emotion and affection, positive and negative emotion), (2) discussing and elucidating the major causes of mental stress of MHD patients, (3) explaining the relationship between emotion and mental stress, the effects of emotion on treatment, transfer of illness, and quality of life, and the effects of different coping modes on individual physical and mental health. Second, description of rational-emotive therapy, including (1) the basic theory, main contents, and significance of rational-emotive therapy, (2) human nature in rational-emotive therapy, the fundamental principle of ABC theory, and the characteristics of irrational belief. All these could make patients understand a fact that poor emotion and behaviors are not caused by events themselves, but by individual assessment and explanation of these events, i.e., individual irrational belief. In addition, it was very essential to understand characteristics of irrational beliefs and the 11 irrational beliefs that easily lead to emotional disturbance. Third, the procedure of rational-emotive therapy includes three phases: (1) Psychodiagnosis: using ABC theory to find emotional disturbance/improper behavioral manifestations (C), corresponding evoked event (A), and the irrational belief between these two. (2) Comprehension: able to use the five criteria for rational and irrational beliefs and acquiring three comprehensions. (3) Application: able to use rational-emotive therapy to release stress and get rid of emotional disturbance.

### Measurement tools

The Chinese versions of SCL-90[8] and MCMQ[8] were used for their good reliability and validity, and wide application at home and abroad. Four clinical indices related to adherence to fluid restrictions, including ratio of interdialysis weight gain to dry weight (IWGR), mean systolic blood pressure, mean diastolic blood pressure, and mean ultrafiltration volume prior to hemodialysis were measured.

### Measurement methods

Prior to and after intervention, two groups of patients were assessed using the above scales. Patients were assessed by professional persons using unified instruction. They were asked to answer the questions independently. As for the questions that patients could not understand, professional persons made some necessary instructions but would not give a hint. Prior to and after intervention, four clinical indices related to adherence to fluid restrictions were measured for three consecutive times in each patient, and the final value for each index was calculated by averaging the three measurements.

### Design, enforcement and evaluation

The first and second authors designed this study, and the first, third, and fourth authors performed and evaluated experiments.

### Statistical analysis

All data were statistically processed using SPSS 11.5 software. Independent-samples t test was employed for comparison of measurement data between groups. Chi-square test was used for comparison of numerical data between groups.

## RESULTS

### Quantitative analysis of participants

During the whole study process, eight patients dropped out, two from the intervention group (due to aggravated disease), and six from the control group (four due to aggravated disease, and two due to medical evacuation). In total 92 patients including 48 from the intervention group and 44 from the control group were included in the final analysis.

### General information of patients (Table 1)

<table>
<thead>
<tr>
<th>Group</th>
<th>Gender (male/female)</th>
<th>Age (yr, ±s)</th>
<th>Serum creatinine prior to hemodialysis (x±s, μmol/L)</th>
<th>Chronic glomerulonephritis</th>
<th>Chronic renal arteriosclerosis</th>
<th>Chronic renal pelvis nephritis</th>
<th>Diabetes mellitus</th>
<th>Hypertension</th>
<th>Systemic lupus erythematosus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>20/28</td>
<td>48.19±12.62</td>
<td>1 294.06±236.25</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>21/23</td>
<td>44.61±13.13</td>
<td>1 217.11±261.69</td>
<td>15</td>
<td>11</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>(X^2/t)</td>
<td>0.341</td>
<td>1.330</td>
<td>1.482</td>
<td>2.336</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(P)</td>
<td>0.559</td>
<td>0.187</td>
<td>0.142</td>
<td>0.801</td>
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</tr>
</tbody>
</table>

### MCMQ scores of two groups prior to and after intervention

Prior to intervention, the scores of confronce subscale were significantly lower, while the scores of avoidance and resignation subscales were significantly higher[9], in two groups of MHD patients than in healthy populations (\(P > 0.05\)). After intervention, the scores of confronce and avoidance subscales were significantly higher, while the scores of resignation subscale were significantly lower, in the intervention group than in the control group (\(P < 0.05\)) (Table 2).

### SCL-90 scores of two groups prior to and after intervention

Prior to intervention, there was no significant difference in total average score of SCL-90 scale, as well as the score of each factor, between two groups. After intervention, total average scores of SCL-90, as well as the scores of somatization, obsessive- compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety and additional items, were significantly lower in the intervention group than in the control group (\(P < 0.05\)) (Table 3).

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[8] SCL-90: Symptom Checklist Rating Scale; MCMQ: Multidimensional Cognitions Questionnaire

[9] Significance levels: \(P < 0.05\)
Indices related to adherence to fluid restrictions in two groups prior to and after intervention

Prior to intervention, there was no significant difference in IWGR%, mean systolic blood pressure, mean diastolic blood pressure, and mean ultrafiltration volume prior to hemodialysis. After intervention, the mean value of each index above-mentioned was significantly lower in the intervention group than in the control group ($P < 0.05$) (Table 4).

**DISCUSSION**

Prior to intervention, the scores of confrontation subscale were significantly lower, while the scores of avoidance and reservation subscales were significantly higher in MHD patients than in healthy populations. But the mean score of no matter confrontation or avoidance subscale was not high. This indicates that MHD patients generally lack effective coping models, which is in accordance with previous findings.[10-12]

Coping, as an intermediary factor of stress and health, plays an important regulatory role during the process of stress influencing mental health. How to cope stresses directly correlates physical and mental health. Effective coping mode maintains physical and mental health and passive coping mode does harm for health. Confrontation is usually considered a most active coping mode, which makes patients concern disease condition and do their best to cure this disease. But there is slim hope for rehabilitation of MHD patients. In addition, most MHD patients have poor economics, with limited social functions, abundant, severe difficulties, and easy to have helpless feeling. Avoidance is to ignore the existence and severity of mental stress and to focus patients' attention to meaningful, helpful matters, which can not solve the problems directly, but it can help forget pains temporarily, stabilize emotions, and search new methods to solve problems.[13] For MHD patients, avoidance is an effective coping mode. Resignation is a passive coping mode that can increase mental stress, which makes patients to be pessimistic, worldweary, resigned, and self-abandoned.

Results from this study revealed that MHD patients have poor mental health, presenting with total average score and average score of each factor of SCL-90 being > 2, showing a positive tendency, which is consistent with previous findings.[14-15] The average score of no matter somatization related to body condition or additional items related to sleep is over 3. This correlates with patients’ disease and lacks of effective coping mode.

After intervention, the scores of confrontation and avoidance were significantly higher, while the scores of acceptance/resignation were significantly lower, as compared with the control group. At the same time, some scores were also significantly lower than those in the control group, total average score of SCL-90, the...
score of somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety and additional items. These findings suggest that rational-emotive therapy can effectively amend the coping model and elevate the level of mental health. Because this therapy can help patients learn to self-estimate correctly, change irrational belief, thereby use more active coping mode, improve mental states, and alleviate negative emotion.

MHD patients survive depending on treatment. Treatment compliance is an important factor that influences therapeutic effects and patients’ quality of life. It is very common that MHD patients lack treatment compliance, and adherence to fluid restrictions is most difficult.

The change of body weight is the best index for judging adherence to fluid restriction. The interdialysis weight gain should be controlled within 1.5 kg for anuric patients. More than 40% of patients can not well comply with this requirement. Lack of adherence to fluid restrictions is a problem of health education and is also influenced by mental factors. Depression symptom and its severity are independent risk factors of non-adherence to fluid restrictions [3]. With alleviation of negative emotions including depression, patients present reduced self-defeating behaviors and learn to eliminate disturbance, thereby adherence to fluid restrictions is enhanced, as manifested by improvements in four clinical indices above-mentioned after intervention.

REFERENCES