



## A Case Report of Curing Major Depression Disorder Only via Light Therapy and Physical Therapy

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### Abstract

Major Depression Disorder (MDD) is a kind of common severe mental disorders with high morbidity and disability rate, of which the principal manifestation is shown as depressed emotion, thinking retardation and abulia. The treatment methods are primarily based on medications, but often accompanied with slow effects, more severe adverse reactions and bad treatment compliance. Previous studies demonstrated obvious efficacy of light therapy and physical therapy when treating MDD. This article introduces a case report of curing major depression disorder only via light therapy and physical therapy for reference.

**Keywords:** Major Depression Disorder; Physical Therapy; Light Therapy

### Introduction

MDD is a kind of common severe mental disorder with syndrome of depressed emotion, thinking retardation, and attention withdraws, hypomnesia, inappetence, sleep disorder and some somatization symptoms [1]. MDD have been the primary and independent risk factor for human disability from the report of World Health Organization in 2017 [2]. The number of patients with MDD have reached 54,000,000 ranking second in burdens of diseases. With obscure pathogenesis and absent radical treatment methods, the lifetime prevalence rate of MDD reaches 15% to 20%. The treatment methods of MDD are mainly based on medications with only 60% to 70% clinical cure rate and 31% to 60% incidence rate of adverse reactions including suicide, serotonin syndrome, metabolic syndrome, cardiovascular and gastrointestinal side effects, of which the manifestation is shown as insomnia, excessive perspiration, sexual dysfunction, weight gain, diarrhea, constipation, headache and nausea [3,4]. These adverse reactions result in the bad treatment compliance and high recurrence rate [5]. The latest studies demonstrated the obvious efficacy of light therapy and physical therapy on depression; however, the parameters of time and intensity are still in controversy [6,7]. This article introduces a case report of curing major depression disorder only via light therapy and physical therapy, who couldn't tolerate long-term antidepressants.

### Datum of Case

#### Medical history

Male 48 years old, who had obvious depression syndrome because of love-related problems since February 2005. The severe conditions significantly destroyed his life and work, leading to poor confidence, no will to attend social activities, being in chaos all day, being late for work, and irritation. So, the patient went to Shanghai Mental Health Center and was diagnosed with MDD. His emotion, mental state and physical strength were improved after the administration of venlafaxine (150 mg/d) for three months. And then he quit the treatment after eight months when the depression symptoms were obviously improved. But his MDD relapsed in October 2006, which was manifested as depressed emotion, being listless and muddleheaded, no will to contact with others, and worse ability of daily life and work, accompanied with obvious somatic symptoms such as arthralgia, Achilles' tendon avulsion, irritable bowel syndrome, and rhinitis. He was hospitalized twice as MDD patient from March 2007 to April 2007 and April 2008 to June 2008, respectively. The patient was administrated with 4 to 5 kinds of antidepressants including venlafaxine and fluoxetine (the patient could not remember the concrete names of these medications and their doses). He

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got high fever, headache, nausea, vomit, great weakness, loss of 7 teeth and sweated profusely, accompanied with poor curative effect. So, the patient could not adhere to medications, who lay in long-term depression with no stomach for anything, and could not take on normal family responsibility, but without self-injured or suicide behavior.

### Treatment

The patient started light therapy and physical therapy under the encouragement of his family since May 2005. The program was as follows: The patient went to Urho Gobi desert (at 40°C and strong sun light), Xinjiang, to pick up jades from 9:00 to 18:00 on weekend, which were bought by his family as rewards. He needs to walk around and bend over to pick up jade, and walk on the Gobi Desert carrying jade bag than 10 kilograms. He drank lots of water and meanwhile sweated profusely. The symptoms of MDD were relieved and he could learn and do some housework on his own initiative after five tasks (successive 2 days per week as one task, totally 10 days). His emotion, sleep, appetite and physical power were gradually recovered after sixteen tasks. The patient quit picking up jades for cold weather since Sep. After stop picking up jades, he felt a lack of interests. Then he started his fitness program which began from 40-min ride to 45-min ride combined with 45-min apparatus exercise per day in gym. The depression symptoms disappeared without any help of medication after 7-week fitness.

### Prognosis

The patient has been living a normal life since December 2016. He could regulate his mood by himself and finally finish the work. He has been keeping stable mood, optimistic mind, regular sleep and healthy conditions except wrist pain sometimes. It has been four years since the symptoms disappeared. There're no fluctuations in his disease, work and life even not insisting on light therapy, physical therapy and any medication. He began to learn calligraphy, carving and painting, and he felt that his learning ability was very strong. Calligraphy, painting, and carving have made great progress in two or three years after improving.

### Discussion

The mechanism of light therapy is considered to be relative to serotonin (5-TH) and Melatonin (MLT). Studies have showed that light therapy increases the concentration of 5-TH *via* the following pathways: Firstly, it improves the efficiency of 5-TH transporter [8]; secondly, it increases the content of tetrahydrobiopterin which is the key coenzyme in producing 5-TH [9]; thirdly, it activates tryptophan decarboxylase which is one of the most important enzymes for the generation of 5-TH [10]. It was reported that significant anti-depression effects would occur within one week when the intensity reached more than 5000lux × h [6]. Clinical studies had also demonstrated that light therapy increased the concentration of MLT in patients with MDD at night to improve their sleep quality [11]. Wirz et al. let 29 patients with recurrent depression receive light therapy for three months with intensity of 5000lux, which showed great improvement in their moods [12]. The patient in this case report picks up jades at Urho Gobi Desert, Xinjiang from 9:00 to 18:00 in two successive days every week, which lasted 16 weeks. Urho is located at E85°19', N46°06', with more than 2,637 cumulative sunshine hours each year and an annual total illumination of more than  $9 \times 10^9$ lux, which is far more intense than the basic intensity of 5000lux × h. And the efficacy of this patient is consisted with previous researches. Aerobic exercise also has positive effect on MDD. The mechanisms

are described as follows: Firstly, it flushes toxins out of the body by sweat; secondly, it activates sympathetic nerve to enhance epinephrine concentration to produce feeling of pleasantness; thirdly, it stimulates the secretion of endorphin to avoid the influence of negative moods [13]; fourthly, it enhances the utilization efficiency of monoamine neurotransmitters such as 5-TH, dopamine and norepinephrine to relieve depression [14]. Perraton et al. [15] analyzed 14 randomized controlled trials related to aerobic exercise and found that depression could be obviously relieved after 8-week aerobic exercise (thrice per week, maintaining 60% to 80% of the maximal heart rate for 30 min). It is considered that light therapy is more effective on atypical depression, and that more ideal efficacy will be gained via the combination of light therapy and physical therapy [16]. The guideline of Canadian Network for Mood and Anxiety Treatments in 2016 recommended physical therapy and light therapy as the first-line or second-line treatment for mild to moderate depression, the second-line treatment for moderate to severe depression [17]. The patient in this case report had pick up jades in Gobi desert of Xinjiang since 2015 which contained light therapy and physical therapy. And then he did physical exercise 40 min to 90 min every day in 2016. The above therapies made him recover from depression, which is consistent with previous studies. The loss of pleasantness is one of the core symptoms of MDD, which lead to lacking of interests, being at loose ends and idleness. Thus, it's very difficult for patients with MDD to participate social activities or have good compliance. So, the patient in this case report was encouraged to pick up jades at Gobi Desert of Xinjiang and was rewarded if got jades, so as to provoke his interest in treatment. The transform from passively receiving light therapy and physical therapy to initiatively adhering to physical exercise in this patient sheds some light on MDD treatment. And the applications of light therapy and physical therapy may provide a new method to enhance the cure rate of MDD without adverse reactions.

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