

Light Therapy for Depression, and Other Treatment of Seasonal Affective Disorder

A Systematic Review

*Revision of Chapter 9 in SBU report
Treatment of Depression (2004), no 166/2*

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Summary and Conclusions of the SBU Report:

Light Therapy for Depression, and Other Treatment of Seasonal Affective Disorder

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SBU's Conclusions

Conclusions

- ❑ The value of therapy with a light box for seasonal affective disorder (SAD or seasonal depression) can be neither confirmed nor dismissed. Thus, although a number of studies have been published since SBU released its “Treatment of Depression” report in 2004, the therapy should still be regarded as experimental. There is no significant difference between placebo and light therapy with regard to the number of patients who improve by at least 50%. The results are contradictory when it comes to the number of patients who experience remission. SBU’s meta-analysis of studies that use light boxes shows that the therapy reduces the severity of depression on a rating scale somewhat more than placebo during the first few weeks but that the effect is temporary (Evidence Grade: Insufficient Scientific Evidence).
- ❑ The evidence is insufficient to determine the effect of light therapy, whether as monotherapy or as an adjunct to antidepressants, on non-seasonal depression.
- ❑ Although treatment in light therapy rooms is well established in Sweden, no satisfactory, controlled studies have been published on the subject. Thus, there is a great need to conduct such studies with enough participants to draw reliable conclusions. Approximately 100 participants are required to establish whether the therapy is moderately more effective than placebo. The studies should also take health economic aspects into consideration.

Fact Box 1 Study Quality and Relevance, Evidence Grade.

Study quality and relevance refers to the scientific quality of a particular study and its ability to reliably address a specific question.

Evidence Grade refers to the total scientific evidence for a conclusion, ie, how many high-quality studies support it.

Evidence Grade 1 – Strong Scientific Evidence

A conclusion assigned Evidence Grade 1 is supported by a good systematic literature overview with a meta-analysis or at least two studies with high quality and relevance among the total scientific evidence. If some studies are at variance with the conclusion, the Evidence Grade may be lower.

Evidence Grade 2 – Moderately Strong Scientific Evidence

A conclusion assigned Evidence Grade 2 is supported by a systematic literature overview with a meta-analysis that fails to meet the requirements for a good systematic overview in some respect or at least one study with high quality and relevance and two studies with medium quality and relevance among the total scientific evidence. If some studies are at variance with the conclusion, the Evidence Grade may be lower.

Evidence Grade 3 – Limited Scientific Evidence

A conclusion assigned Evidence Grade 3 is supported by a systematic literature overview with a meta-analysis that fails to meet the requirements for a good systematic overview in several respects or at least two studies with medium quality and relevance among the total scientific evidence. If some studies are at variance with the conclusion, the scientific evidence may be regarded as insufficient or contradictory.

Insufficient Scientific Evidence

If no studies meet the quality and relevance criteria, the scientific evidence is rated as insufficient to draw any conclusions.

Contradictory Scientific Evidence

If different studies are characterised by equal quality and relevance but generate conflicting results, the scientific evidence is rated as contradictory and no conclusions are drawn.



SBU's Summary

Background

In 1984, Dr Norman Rosenthal, a psychiatrist and National Institute of Mental Health researcher, first described a condition that he called seasonal affective disorder (SAD or seasonal depression). SAD included people who previously had major depression or bipolar disease, who had depressive episodes during two consecutive autumns or winters, and who recovered during the brighter part of the year. SAD now refers to seasonal depression during the spring and summer as well. Epidemiological studies suggest that 1–10% of the population, the higher figures occurring in North America, is affected. However, many of the studies have used the Seasonal Pattern Assessment Questionnaire (SPAQ) self-rating scale, which tends to overestimate the prevalence of the disease in the view of more recent research¹.

Because SAD tends to be associated with the dark time of the year, the idea that exposure to light could alleviate its symptoms was proposed early on. Many studies have subsequently examined the efficacy of therapy with various sources and intensities of light, durations of exposure and times of day. Light therapy has also been tried for other conditions, particularly major depression.

¹ Magnusson A, Partonen T. The diagnosis, symptomatology, and epidemiology of seasonal affective disorder. *CNS Spectr* 2005;10:625–34.

SBU assessed the literature on light therapy as part of a 2004 report entitled “Treatment of Depression”². On the basis of studies that had been published prior to summer 2003, the report concluded that light therapy was no more effective than placebo. Given that a number of new studies have been published since that time, those conclusions needed review. Meanwhile, the Swedish National Board of Health and Welfare has requested an update in connection with its effort to lay down national guidelines for anxiety and depressive disorders.

SBU decided to perform a systematic review of the literature on the use of light therapy for depression. The efficacy of other methods for treating SAD was also to be assessed.

The review was intended to address the following questions:

- Is light therapy more effective than placebo in treating SAD?
- Are there other effective (drug) therapies for SAD?
- Does the effect of antidepressants on non-seasonal depression set in more rapidly when light therapy is used as an adjunct treatment?
- Is light therapy a more effective monotherapy than placebo in treating non-seasonal depression?

Methodology

The PubMed database was searched for literature, and bibliographies in overviews were checked. The review covered randomised, controlled trials with at least 10 participants in each treatment group. The light source had to emit bright white light. Studies that used light as an adjunct to wake therapy, which is not administered in Sweden, were excluded. The outcome measure had to

² SBU. Treatment of depression. A systematic review. stockholm: The Swedish Council on Technology Assessment in Health Care (SBU); 2004. SBU report no 166/2.

be scores on the Hamilton Depression Rating Scale (HDRS) or Structured Interview Guide for the Hamilton Depression Rating Scale – Seasonal Affective Disorder Version (SIGH-SAD).

The project followed SBU's process for literature reviews. All studies included were reviewed by three independent referees in the project group on the basis of SBU's quality template for psychiatric projects. Studies that met the criteria for high or medium quality and internal validity provided the scientific basis for drawing conclusions about treatment effects. The conclusions were assigned evidence grades in accordance with the fact box above.

The project also involved performing meta-analyses when possible in order to assess the magnitude of treatment effects, as well as conducting a survey of clinical practice.

Results of the Literature Review

The 18 studies that met the inclusion criteria form the basis of SBU's conclusions. Two meta-analyses that were part of the review suffered from such serious methodological flaws that they could not contribute to the conclusions.

Question 1:

Is light therapy more effective than placebo in treating SAD?

Six studies of medium quality and relevance served as a basis for addressing this question. The efficacy of light therapy was difficult to assess. A meta-analysis performed by the project group showed that, measured as the difference between depression scores before and after two or three weeks of treatment, light therapy had a small but significant advantage over placebo. The difference subsequently disappeared. If the outcome measure was response (a reduction of at least 50% on the depression score), there was no difference between the two groups. The most relevant clinical measure is remission involving a 50% reduction on the score combined with a pre-defined top score upon completion of treatment.

Measured in terms of the number of patients who experienced full remission, the results were contradictory.

Question 2:

Are there other effective (drug) therapies for SAD?

Four studies of medium quality and relevance served as a basis for addressing this question. Two of them compared selective serotonin reuptake inhibitors (SSRIs) with placebo, but the effects were equivocal. The other two studies compared SSRIs with light therapy and found that they were equally effective. Given that the studies lacked placebo groups, the results are difficult to assess and no conclusions can be drawn.

Question 3:

Does the effect of antidepressants on non-seasonal depression set in more rapidly when light therapy is used as an adjunct treatment?

This question relates to a hypothesis that light therapy can alleviate the symptoms of depression before the effect of the antidepressant has set in. Four studies of medium quality and relevance, one of which examined the impact of discontinuing light therapy, served as a basis for addressing this question. The results were highly heterogeneous, and the results were contradictory. Thus, no conclusions can be drawn about the efficacy of light therapy as an adjunct treatment.

Question 4:

Is light therapy a more effective monotherapy than placebo in treating non-seasonal depression?

Five studies were identified, but only two were of medium quality and relevance. Because they examined the effect on totally different patient populations and the results were contradictory, no conclusions can be drawn from the evidence.

Overall Assessment

The literature shows that light therapy has at best a small and temporary effect on SAD, while the evidence that it relieves non-seasonal depression is insufficient. All studies used light boxes, normally used in the home of the patient.

The responses to a questionnaire sent to directors of psychiatric units indicated that light therapy is well established in Sweden. Based on the method developed in Stockholm during the 1990s, the treatment in Sweden is usually administered in a light therapy room. Due to a lack of satisfactory controlled trials that have studied the efficacy of light therapy rooms, this treatment should still be regarded as experimental.

One appropriate response to the lack of evidence would be to earmark resources for the healthcare profession to study the efficacy of light therapy rooms during the dark part of the year. A co-ordinated effort to resolve this issue as quickly as possible would be advisable. Such a study should also take health economic aspects into consideration.

That would give patients with SAD the opportunity to choose between participate in a scientific study using light therapy or to receive customary treatment for depression. A pilot study using cognitive behavioural therapy showed a beneficial, long-term effect, but additional studies are needed to investigate the value of the method for SAD.

Reports *published by SBU*

SBU Reports in English

Obstructive Sleep Apnoea Syndrome (2007), no 184E
Interventions to Prevent Obesity (2005), no 173E
Moderately Elevated Blood Pressure (2004), Volume 2, no 172/2
Sickness Absence – Causes, Consequences, and Physicians' Sickness Certification Practice, Scandinavian Journal of Public Health, suppl 63 (2004), 167/suppl
Radiotherapy for Cancer (2003), Volume 2, no 162/2
Treating and Preventing Obesity (2003), no 160E
Treating Alcohol and Drug Abuse (2003), no 156E
Evidence Based Nursing: Caring for Persons with Schizophrenia (1999/2001), no 4E
Chemotherapy for Cancer (2001), Volume 2, no 155/2
CABG/PTCA or Medical Therapy in Anginal Pain (1998), no 141E
Bone Density Measurement, Journal of Internal Medicine, Volume 241 Suppl 739 (1997), no 127/suppl
Critical Issues in Radiotherapy (1996), no 130E
Radiotherapy for Cancer, Volume 1, Acta Oncologica, Suppl 6 (1996), no 129/1/suppl
Radiotherapy for Cancer, Volume 2, Acta Oncologica, Suppl 7 (1996), no 129/2/suppl
Mass Screening for Prostate Cancer, International Journal of Cancer, Suppl 9 (1996), no 126/suppl
Hysterectomy – Ratings of Appropriateness... (1995), no 125E
Moderately Elevated Blood Pressure, Journal of Internal Medicine, Volume 238 Suppl 737 (1995), no 121/suppl
CABG and PTCA. A Literature Review and Ratings... (1994), no 120E
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Stroke (1992), no 116E
The Role of PTCA (1992), no 115E
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Light Therapy for Depression, and Other Treatment of Seasonal Affective Disorder (2007), no 510-37
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Prevention, Diagnosis & Treatment of Venous Thromboembolism (2002), no 510-18
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Surgical Treatment of Rheumatic Diseases (1998), no 510-2
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SBU Evaluates Health Care Technology

Below is a brief summary of the mission assigned to SBU by the Swedish Government:

- SBU shall assess healthcare methods by systematically and critically reviewing the underlying scientific evidence.
- SBU shall assess new methods as well as those that are already part of established clinical practice.
- SBU's assessments shall include medical, ethical, social and economic aspects, as well as a description of the potential impact of disseminating the assessed health technologies in clinical practice.
- SBU shall compile, present and disseminate its assessment results such that all parties concerned have the opportunity to take part of them.
- SBU shall conduct informational and educational efforts to promote the application of its assessments to the rational use of available resources in clinical practice, including dental care.
- SBU shall contribute to the development of international co-operation in the field of health technology assessment and serve as a national knowledge centre for the assessment of health technologies.



Light Therapy for Depression, and Other Treatment of Seasonal Affective Disorder

The SBU report is based on a systematic and critical review of the scientific literature. It is one of a series of scientific reports published by SBU (The Swedish Council on Technology Assessment in Health Care).

The Summary and Conclusions of the report, presented in this booklet, have been approved by the SBU Board of Directors and the Scientific Advisory Committee.