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MINI-REVIEW

The Light of Hope in Antidepressant Strategies

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Light therapy (LT) is both an old and a new treatment because of major new insights and evidence that have been accumulated over last decades. LT shows efficacy as a first-line monotherapy in treating seasonal and non-seasonal depression, for both unipolar and bipolar disorders. LT can be used as an add-on/augmentation strategy and increases the response to antidepressant drugs (AD), but recent findings confirmed also the need to change practices and recommend a first-line combination treatment in order to maximize patients' response rates, as a clear superiority of the combination exist compared with antidepressants alone. LT has the advantage of being also effective in improving both sleep, alertness and circadian rhythms, which may be altered in depression, contrary to AD that target mainly mood. LT effects are dependent on the light dose (determined by light irradiance level, duration of exposure, distance and angle from the light source), light color spectrum, and on the time of day of light exposure. Further research are warranted to determine the most efficient lighting parameters to use depending on depression characteristics, as well as identifying predictive biomarkers of response and tolerability.

Key Words: Phototherapy; Light therapy; Depression; Major depressive disorder; Bipolar disorders

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INTRODUCTION

Light therapy (LT) benefited from major new insights and evidence that have been accumulated over last decades. It is time to consider LT as a first-line treatment in depression and this brief review offers a snapshot of where the actual scientific knowledge stands.

BRIEF LIGHT THERAPY HISTORY OF ITS CLINICAL MOOD EFFECTS

LT is both an old and a new treatment. Old, because LT is used since the Antiquity with sun therapies that were applied in ancient Chinese, Hindu and Egyptian medicine over 15 centuries BC [1]. New, because psychiatry benefited from a recent growing interest in LT since the publication of a case-series of patients successfully treated for seasonal affective disorder (SAD) by Rosenthal et al. [2] in 1984. Since this first documentation of LT in SAD, numerous studies have been published in seasonal depressions and several meta-analyses of randomized trials have confirmed that LT is more efficient than placebo in subjects with both unipolar depression [3] and bipolar depression [4] with seasonal patterns. Interestingly, LT appeared also efficient in non-seasonal unipolar depression [3,5]. LT has been assessed not only as a monotherapy, but is also commonly used as an augmentation strategy to antidepressant drugs (AD) in non-seasonal depression, for both unipolar and bipolar disorders [6,7]. Indeed, in up to 50% to 60% of patients who did not respond to AD monotherapy [8], LT used as an add-on/augmentation strategy increased the response [6]. In addition, a recently published meta-analysis [9] confirmed the need to change practices and recommend a first-line combination treatment in order to maximize patients' response rates, rather than using LT as a second- or third-line augmentation strategy. This meta-analysis evidence that LT and antidepressants have no superiority among each other, when introduced as a first-line treatment in major depressive episodes (MDE) with and without seasonal pattern, and with a clear superiority of the combination of the two compared with antidepressants alone [9]. This is supporting LT use as an additional excellent first-line antidepressant strategy [9]. Moreover, LT is thus not

only the cornerstone treatment of SAD [2], but also should be used as a first-line monotherapy or combination therapy in non-seasonal MDE. In this indication, LT appears also well tolerated in the treatment of adults with moderate to severe non-seasonal unipolar depression, with effect sizes equivalent to those observed in trials using selective serotonin reuptake inhibitors [3,5], as in bipolar disorder [10].

OTHER EFFECTS OF LIGHT IN MOOD DISORDERS

LT has the advantage of being also effective in improving both sleep and circadian rhythms, which may be altered in depression, contrary to AD that target mainly mood [11]. Interestingly first evidence of possible LT efficacy comes from basic neurosciences reporting in 1979 that phase shifts of circadian rhythms could have an antidepressant effect [12] and in 1980 that light suppresses melatonin secretion and so impacts circadian rhythms in humans, like for all other mammals [13]. Thus antidepressant effect of LT may be link to both a phase advance and/or alignment of circadian rhythms, first confirmed by Kripke et al. [14,15] and Lewy et al. [16], but also to more direct effects [17]. Indeed, LT effects are associated with mechanisms that are independent of the circadian clock and act directly on monoaminergic pathways, as suggested with observed efficacy even at midday [17,18]. These direct and indirect effects may explain why light exerts a strong direct and rapid effect on mood [18,19]. LT also enhances alertness with such direct and rapid effect [20] and increases the sleep homeostasis, which regulates the sleep intensity [21]. LT has also demonstrated to improve sleepiness and sustained attention [22]. This multiple possible interesting effects, depending on the clinical manifestations, are dependent on the light dose (determined by light irradiance level, duration of exposure, distance and angle from the light source), light color spectrum, and on the time of day of light exposure [23-25]. Further research are warranted to determine the most efficient lighting parameters to use [26]. Figure 1 summarizes the parameters and effects of LT in mood disorders. Table 1 summarizes the standard protocols for LT in MDE [27].

PERSPECTIVES

It remains critical to evaluate whether LT can be used as a maintenance treatment, as well as identifying predictive biomarkers of response and tolerability. In addition, light effects and tolerance may depend on depression subtypes, warranting specific further studies. Indeed, depression encompasses very heterogeneous entities such as SAD, unipolar or bipolar subtypes, psychotic, melancholic, etc., which may benefit from different efficient lighting parameters, as in bipolar disorders where patients should be pretreated with an anti-manic mood stabilizer and light be titrated with a daily exposure time starting with 15 minutes (instead of 30 min in unipolar depression) and increased slowly to avoid manic switch [27]. Nevertheless this agenda is possible and very expected only because from a clinical level LT appears as a clear efficient antidepressant strategy that deserve his place in the first-line therapeutic armamentarium of MDE. In line with this, the International Society for Bipolar Disorders (ISBD) task force recently published

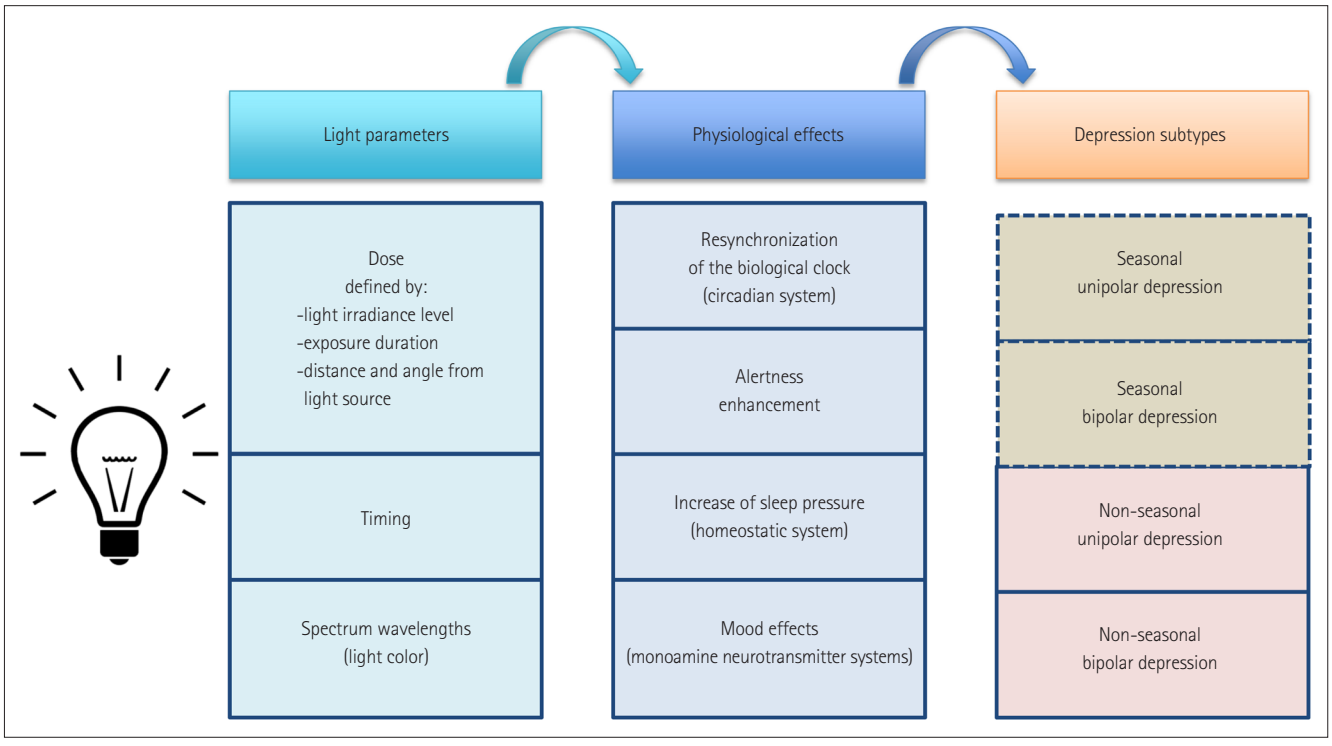

Figure 1. Parameters and effects of light therapy in mood disorders.

Table 1. Standard protocols for light therapy in major depressive episode

Light therapy use in major depressive episode	
Dose	
Light irradiance level depends on exposure duration	10,000 lux for 30 min/day; or 5,000 lux for 1 h/day; or 2,500 lux for 2 h/day cf) If bipolar disorders: slower increase, for instance—5,000 lux with increase of 15 min per week until 60 min at one month (depending on efficacy and tolerance)
Distance and angle from light source	Lamp at eye level; distance of 30–80 cm (depending on the device recommendations); direct exposition
Timing	-Early morning (for instance: 8 AM, chronotype may be considered) -Daily, with regular schedules cf) If bipolar disorders: consider midday (especially if there is an history of manic switch) or early morning
Onset of response	1 week
Treatment duration	Until reduction of depressive symptoms or maintained in case of relapse when stopped; or If seasonal patterns: until the period of usual spontaneous remission in the spring or summer
Prevention	Possibility to treat by light therapy a few weeks before the usual seasonal depressive relapse period
Manic switch prevention	Only with a mood stabilizer with antimanic properties in case of bipolar disorders
Adverse effects	Manic switch; Mild side effects: headache, eyestrain, nausea, agitation
Contraindications	Ophthalmic disorders (cataract, macular degeneration, glaucoma, retinitis pigmentosa) and disorders affecting the retina (retinopathy, diabetes, herpes, etc.)

Adapted from Maruani and Geoffroy. Front Psychiatry 2019;10:85 [27].

practice recommendations for LT as a first-line treatment in bipolar depression [28].

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None

Conflicts of Interest

The author has no potential conflicts of interest to disclose.

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