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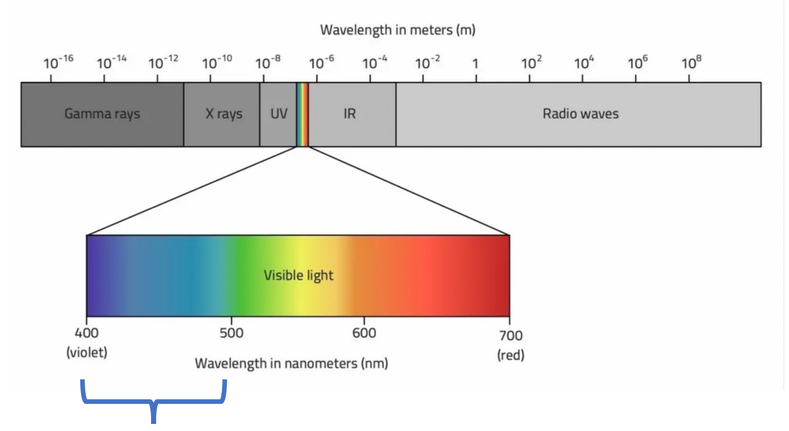


Evaluation of the effectiveness and safety of blue light emitted by LED lamps using the PHLECS device in the treatment of inflammatory skin diseases

Introduction

UV-free blue light phototherapy has emerged as a promising option due to its reported efficacy and minimal adverse effects. This study aims to evaluate the effectiveness of full-body blue light irradiation in both adult and pediatric atopic dermatitis (AD) patients, assessing its impact on skin condition and mood regulation by investigating serum concentrations of serotonin and kynurenine pathway metabolites.

Methods

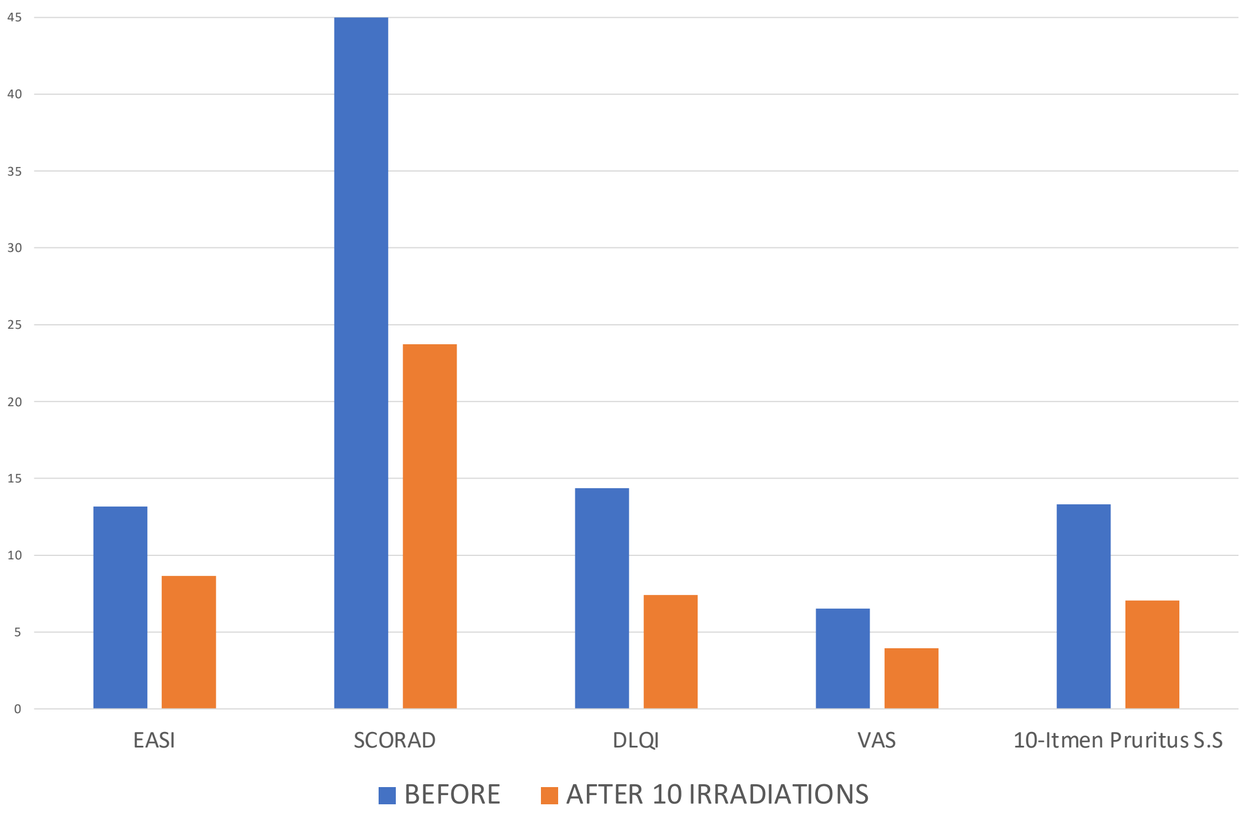
20 patients (age 9 - 45) with moderate and severe AD were included in the study. Treatment consisted of 10 irradiations with Full Body Blue device (453nm). Serum concentrations of serotonin, quinolinic acid, kynurenic acid, tryptophan, and kynurenine were measured before and after irradiations.

Results

After 10 sessions of full blue light therapy (453 nm) statistically significant improvements were observed in Eczema Severity Index - EASI (13.16 vs. 8.65; p = 0.00016), SCORIng Atopic Dermatitis - SCORAD (44.99 vs. 23.73; p<0.00001), Visual Analogue Scale - VAS (6.53 vs. 3.95; p = 0.00251), 10-item pruritus severity scale (13.32 vs. 7.05; p< 0.00001). Moreover, statistically significant decrease in Dermatology Life Quality Index - DLQI was noted (14.37 vs. 7.42; p = 0.00351). Additionally, increase in the serum concentration of serotonin was observed after completing 10 irradiation sessions (median 139.77 mg/ml vs. 274.92 mg/ml; p < 0.00001).

Conclusion

Blue light may be a promising and safe treatment in atopic dermatitis patients. It might also positively influence the mood. Further investigations are needed to confirm those findings.



Full-body blue treatment in 20 patients with AD

EASI (13.16 vs. 8.65; p = 0.00016), SCORAD (44.99 vs. 23.73; p<0.00001), DLQI (14.37 vs. 7.42; p = 0.0035), VAS (6.53 vs. 3.95; p = 0.00251), 10-item pruritus severity scale (13.32 vs. 7.05; p< 0.00001).

assesments	before the treatment	DAY 0 - before the treatment	after 10 irradiation session
informed consent	X		
demografic information: age, sex	X	X	X
photo documentation		X	X
skin phototype according to Fitzpatrick's scale		X	X
medical history	X	X	X
comorbidities	X	X	X
concomitant medications	X	X	X
skin examination	X	X	X
scales completion: DLQI, 10-item pruritus severity scale, SCORAD, EASI, VAS		X	X
blood sample collection		X	X
safety: adveres events			X

	Before the treatment		After 10 irradiations		
	median	stand. dev.	median	stand. dev.	p-value
Serotonin (mg/ml)	139.77	38.05	274.92	13.95	< .00001*
Quinolinic acid (mg/ml)	48.08	13.95	45.07	16.81	0.60942
Kynurenic acid (mg/ml)	67.32	16.58	60.62	16.36	0.24883
Tryptophan (mmol/l)	81.52	28.48	70.84	21	0.31383
kynurenine (mmol/l)	3.32	1.56	3.1	1.5	0.98835

	Before the treatment		After 10 irradiations		
	median	stand. dev.	median	stand. dev.	
EASI	13.16	3.59	8.65	2.06	0.00016*
SCORAD	44.99	8.50	23.73	3.09	< .00001*
DLQI	14.37	7.65	7.42	5.65	0.00351*
VAS	6.53	2.44	3.95	1.79	0.00251*
10-Item Pruritus S.C.	13.32	3.60	7.05	3.82	< .00001*

*statistically significant

Why carry out this study?

- Both topical and systemic treatments in AD pose the risk of developing adverse effects, blue light therapy might be a possible alternative with high safety profile.
- The aim of this study was to assess the effectiveness of full body blue irradiations in the treatment of AD in adult and pediatric populations. Furthermore, we aimed to investigate whether blue light had an impact on serum concentrations of serotonin and kynurenine pathway metabolites involved in mood regulation as patients with AD, due to the chronic and recurrent nature of the disease along with the distressing itch, sleeplessness, are at risk of developing mood disorders and depression.

What was learned from the study?

- After 10 sessions of full blue light therapy statistically significant improvements were observed in EASI, SCORAD, VAS , 10-item pruritus severity scale, DLQI and statistically significant increase in the serum concentration of serotonin was observed.
- Blue light seems to be a promising and safe treatment in atopic dermatitis patients and might be enhancing the mood, but further investigations are needed to confirm those findings
- Blue light could be a possible therapy for patients with contraindications to conventional therapies or as a combined therapy with conventional methods