

EXPOSURE TIME TO SUNLIGHT FOR PUVASOL

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Exposure time to sunlight for PUVASOL is often arbitrarily determined. This can lead to either inadequate or over-exposure. We have evolved a computer programme from which the exposure time can be determined. The programme takes into consideration the variations of UV light at different times of the day. We hope to extend this pilot study to various places in India.

Key words : PUVASOL, Computer programme, Exposure time.

PUVASOL is an effective treatment for psoriasis. However, exposure time to sunlight is arbitrarily determined. As the quantum of UV light in sunlight varies from place to place, at different times of the day and altitude,¹ the arbitrary exposure time may result in excessive or inadequate joules of UV light. There may also be marked variations of UV light received by the patient during each exposure. In this pilot study, we have evolved a computer programme which presents in a tabulated form the exposure time and increment time for given joule.

Materials and Methods

UVA light from sunlight was measured by a UV photometer at 9 a.m., 10 a.m., 11 a.m., 3 p.m., 4 p.m. and 5 p.m. Readings were taken for two angles, 60° east and 120° west. East and West were determined by a compass and the angles were ascertained by a protractor. To calculate the exposure time to sunlight, the amount of UVA in joules/cm² was first determined. The usual dose is 5.5 to 11 j/cm² in Asiatics, the increments are usually 1 J per exposure.² Once the number of joules per dose is decided, the exposure time is determined by the formula $16.7 \times \frac{\text{prescribed dose of UVA (J/cm}^2\text{)}}{\text{reading from the photometer (mw/cm}^2\text{)}}$.² A computer programme using

PASCAL, a computer language, has been evolved into which the various data such as time, angle etc can be entered. Following entry of the data, the computer print-out would give information regarding the exposure time (Table I).

Results

The computer print-out (Table I) shows the exposure time to sunlight at different times and angles for a given number of joules. For example at 11 a.m., a patient facing the sun at 60°E would have to be exposed to sunlight for 12 minutes and 59 seconds so as to receive a dose of 7 joules/cm².

Comments

This study has been done to evolve a cheap method to utilize the solar ultraviolet light most effectively for the treatment of psoriasis. The study is in progress in Manipal, situated on the western coast. We intend to extend the study and hope to evolve a similar table for various regions. The table would provide exposure time for different seasons at different times of the day. Readings are taken for two angles (east and west) to ascertain if effective exposure can be carried out during evening hours also. We however appreciate that exposure time may not be accurate if the centre does not possess a photometer but still it would be far more accurate than the arbitrary time of exposure now recommended. However, the additive effect of UVB and its effect on exposure time has not been taken into consideration in this study.

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Table I. Exposure and increment time to sunlight at different times and angles for PUVASOL.

Time	Angle in degrees	Photometer reading (mw/cm ²)	The exposure time in minutes(m) and seconds(s) when the dose in joules/cm ² was								
			0.5 m.s.	1 m.s.	6 m.s.	7 m.s.	8 m.s.	9 m.s.	10 m.s.	11 m.s.	12 m.s.
9.00 a.m.	60	6.5	1.16	2.32	15.17	17.50	20.23	22.56	25.29	28.2	30.35
	120	1.25	6.40	13.21	80.9	93.31	106.52	+	+	+	+
10.00 a.m.	60	7	1.11	2.23	14.18	16.41	19.5	21.28	23.51	26.14	28.37
	120	2	4.10	8.20	50.5	58.26	66.47	75.8	82.29	91.50	100.11
11.00 a.m.	60	9	0.5	1.51	11.7	12.59	14.50	16.41	18.33	20.24	22.15
	120	5	1.31	3.2	18.13	21.15	24.17	27.19	30.21	33.23	36.26
3.00 p.m.	60	2	4.10	8.20	50.5	58.26	66.47	75.8	83.29	91.50	100.11
	120	8.5	0.58	1.57	11.47	13.45	15.43	17.40	19.38	21.36	23.34
4.00 p.m.	60	1	4.38	9.16	55.39	64.56	74.13	83.29	92.46	102.3	111.19
	120	8	1.2	2.5	12.31	14.36	16.41	18.47	20.52	22.57	25.2
5.00 p.m.	60	1.25	6.37	13.5	79.31	92.46	106.1	119.17	120	120	120
	120	3.7	6.37	4.30	27.4	31.35	36.6	40.37	45.8	49.38	54.9

References

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