

Q2: Can oral Psoralen + UVA (PUVA) be used to treat a child with morphea?

A: It is correct to be cautious about PUVA use in children, there are a number of concerns to be carefully considered.

One concern about oral PUVA for young children, is that the lens, and vitreous humor, is likely to be more transparent at a young age thereby allowing some ultraviolet, not only visible light, to reach the retina. There have been few studies showing that in younger people more ultraviolet reaches the retina [1]. The (theoretical) concern is that psoralen and ultraviolet A could cause retinal damage if there is incomplete adherence to standard eye protection advice. For children a cautious approach of suitable glasses for daylight hours during 24 hours after taking the tablets is appropriate. Retinal damage could be serious, so although unlikely it is important to consider.

Another issue is as regards increased cataract risk: the reasons for being extra-cautious in children are that a) some children might be less good than adults at following protection advice [2] and b) a child is likely to have more years during which a problem might develop. Topical PUVA, even with bathwater exposure, reduces the ocular risk as the amount of psoralen absorption, except in erythroderma, is low (similar to dietary psoralen exposure).

If starting PUVA therapy at a young age there is more time for sufficient exposures to increase skin cancer (mainly SCC) risks: this is a similar concern regardless of the route (topical or oral) of the psoralen. In practice this is more of a worry regarding conditions like psoriasis (likely to continue to recur when it starts at a young age) than morphea (hopefully will eventually “burn-out”).

A potential issue at certain times of year, is that the child will be more prone to “sunburn” throughout the photochemotherapy course - most sensitive during the few hours after taking psoralen tablets twice a week, but also more sensitive than usual even on the days between PUVA – once monoadducts form after first psoralen-UVA interaction occurs there is increased sensitivity even after psoralen blood, and presumable skin, levels have fallen.

An alternative to PUVA for morphea is broadband UVA (PUVA cubicle but no psoralens) – higher doses such as 20 J/cm² [3] are likely to cause a problem in someone of low skin phototype (no problems in the Egyptian population studied) but lower doses might be effective [4]. No one has directly compared with UVA1 but it is possible that in those of fairer skin phototypes, who cannot get much UVA1 without limiting erythema from UVA2 from broadband UVA lamps, as used also for PUVA, broadband UVA will be less effective than UVA1.

The ultraviolet options are therefore

- 1) use oral PUVA (if bath PUVA not an option) being sure that the child and family fully understand the importance of eye protection

- 2) try broadband UVA (“PUVA” lamps but no psoralen)
- 3) refer to a specialist centre (such as Ninewells Hospital in Dundee) for assessment and consideration of UVA1 phototherapy.

References:

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2. Ling, T.C., T.H. Clayton, J. Crawley, L.S. Exton, V. Goulden, S. Ibbotson, K. McKenna, M.F. Mohd Mustapa, L.E. Rhodes, R. Sarkany, and R.S. Dawe, *British Association of Dermatologists and British Photodermatology Group guidelines for the safe and effective use of psoralen-ultraviolet A therapy 2015*. Br J Dermatol, 2016. **174**(1): p. 24-55.
3. El-Mofty, M., H. Zaher, M. Bosseila, R. Yousef, and B. Saad, *Low-dose broadband UVA in morphea using a new method for evaluation*. Photodermatol Photoimmunol Photomed, 2000. **16**(2): p. 43-9.
4. El-Mofty, M., W. Mostafa, M. El-Darouty, M. Bosseila, H. Nada, R. Yousef, S. Esmat, M. El-Lawindy, M. Assaf, and G. El-Enani, *Different low doses of broadband UVA in the treatment of morphea and systemic sclerosis*. Photodermatol Photoimmunol Photomed, 2004. **20**(3): p. 148-56.