



University of Dundee

Irradiance, as well as body site and timing of readings, is important in determining ultraviolet A minimal erythema dose. (Response to Gambichler et al. July BJD)

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3 **Irradiance, as well as body site and timing of readings, is important in**
4 **determining ultraviolet A minimal erythema dose.**
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3 Dear Sir,
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7 **Irradiance, as well as body site and timing of readings, is important in**
8 **determining ultraviolet A minimal erythema dose.** (Response to Gambichler *et*
9 *al.* July BJD)
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15 Gambichler *et al.* demonstrated that, in their population, using a 25 mWcm^{-2}
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17 ultraviolet A-1 (UVA-1) source the median *24-hour* delayed minimal erythema dose
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19 (MED) on the *inner forearm* was $> 130\text{ Jcm}^{-2}$.¹ This differs from the 20 Jcm^{-2} to 28
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21 Jcm^{-2} median MED reported from our centre.² The authors suggested the disparity
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23 might be explained by different methodologies. We agree and wish to expand on this
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25 point. Rather than being contradictory, the studies by Gambichler *et al.* and Beattie *et*
26
27 *al.* are in excellent agreement.
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31 The first main difference between the studies was the time when the MED was
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33 determined. Beattie *et al.* demonstrated that UVA-1 erythema peaked between 4 and
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35 8 hours (h) with the MED being approximately half that at 24 hours.²
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39 A second difference between the two studies was the site of testing. The inner
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41 forearm was tested in the Gambichler study whilst both back and inner forearm were
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43 tested in the Dundee study. Our study demonstrated that the back is around twice as
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45 sensitive to UVA1 as the inner forearm.
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49 In recognition of this, in their discussion Gambichler *et al.* noted that their result at 24
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51 h on the inner forearm should be compared with the Beattie result at the same time
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53 point and in the same body location, that is a median MED of 68 Jcm^{-2} .
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3 Critical, however, is a third difference between the two studies. In a study by Kagetsu
4 *et al.* it was demonstrated that UVA-induced erythema is irradiance dependent,³ at
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6 24 hour observations. They showed that a higher irradiance gave a lower MED.
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11 The irradiance of the Gambichler *et al.* study was 25 mWcm⁻² and the Beattie study
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13 was 70 – 77 mWcm⁻². Taking the median MED from the recent study and correcting
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15 for time of observation, site of testing and irradiance of light source results in a
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17 reduction in MED from >130 Jcm⁻² to >24 Jcm⁻², similar to the median MED of
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19 20 Jcm⁻² – 28 Jcm⁻² reported by Beattie *et al.*
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23 This highlights that variables including body site, time point *and irradiance*, must
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25 be considered when interpreting ultraviolet threshold erythema dose
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27 characteristics.
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30 31 **References:**

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