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INVITED COMMENTS

Current treatment options for port wine stain birthmarks

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Port wine stain birthmarks;
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I applaud Qin et al. for their publication, ''Photodynamic therapy of port wine stains — a report of 238 cases'' [1]. Such extensive experience with photodynamic therapy (PDT) for port wine stains (PWS) is impressive and I believe, unequaled in the Western world. In the United States and Europe, pulsed lasers and light sources, especially the pulsed dye laser (PDL; wavelengths = 585 or 595 nm) are the treatment of choice for PWS and it is unusual for other treatment modalities to be utilized [2]. However, physicians familiar with PDL therapy for PWS agree that while dramatic results can be achieved, many lesions are resistant and complete removal is uncommon. Lesions in older patients (non-infants) and in those with darker skin types are particularly difficult to treat.

This report by Qin et al. confirms what Chinese physicians have known for a decade or more, PDT is an alternative option with a significant degree of success, and could be considered the treatment option of choice for some PWS patients. Response rates reported are similar to those associated with PDL therapy. However, only 1—4 treatments were required (PDL treatment for PWS generally requires 6 or more treatments). The authors note that the greatest success was achieved in patients 5—20 years old. Light dosing was more difficult and scarring more common in those under 5. This is in contrast to PDL therapy, where the greatest lesion lightening has been reported in young patients [3]. Further research is required, but perhaps PDL treatment is optimal when therapy is begun in those under 5 years, with PDT being an option for those 5 and older.

The PDT protocol reported in this paper results in photosensitivity for a prolonged period (the authors report patients ''stayed away from sunlight exposure for 4 weeks''). This does not occur with PDL (although patients are advised to protect themselves from the sun to minimize adverse effects such as post-inflammatory pigmentary change). Use of alternative photosensitizers such as benzoporphyrin derivative monoacid ring A would shorten the period of photosensitivity [4] (2—5 days). Development of additional photosensitizers with even faster elimination times may be possible [5].

My research group has explored the possibility of combining PDT and PDL (PDT + PDL), in an effort to take advantage

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of the benefits while minimizing the limitations of each of these therapies. For our experiments, we have used BPD as the photosensitizer in combination with 576 nm light for PDT and a 585 nm pulsed dye laser. In preliminary proof-of-concept studies in a chick chorioallantoic membrane model, PDT + PDL intervention resulted in significantly more vascular damage than other study groups: 127% more than PDT ($p < .01$) and 47% more than PDL alone ($p < .01$) [6]. Further studies in a rodent dorsal skin fold model, achieved a reduction in perfusion in all intervention groups, with PDT + PDL resulting in the greatest reduction in vascular perfusion (56%) [7]. Clinical trials are on-going, but in test spots we have similarly achieved improved blanching in the PDT + PDL spots as compared to PDT or PDL alone [8].

Additional exciting potential treatment strategies include use of agents which may affect vascular formation such as Akt (a signaling pathway) inhibitors or rapamycin [9]. Such agents may one day be used as treatments for vascular malformations or perhaps as adjuncts to augment responses achieved with PDT, PDL and PDT + PDL approaches.

Perhaps the most important point of this discussion is that there are multiple ways to approach treatment of PWS birthmarks. Clinicians and scientists around the world have varying areas of expertise and perhaps with international collaboration we could determine methods to consistently and completely remove these birthmarks, eliminating a lifetime of heartache for these patients.

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