

Overview of Medical Therapies and Phototherapy in Vitiligo Based on Their Pathogenetic Action and the Role of Platelet-Rich Plasma

Numerous medical therapies have been tried in vitiligo with varying results, depending on the age, site, type, extent, duration of vitiligo, stability of disease, and its disease activity.^[1,2] But only nonsurgical therapies can address the varied pathogenetic aspects of vitiligo. In fact, as can be seen in Table 1, agents [narrow band ultraviolet rays - B (NBUVB), psoralens and ultraviolet rays - A (PUVA)] that work on multiple steps have a higher efficacy and lower relapse rates.^[8] A plethora of novel medical therapies is available with some having remarkable scientific basis but the *in vivo* results belie the hopes that the original researchers claim. A classic example is afamelanotide, which does not address the autoimmune aspects of the disease and hence does not achieve long-lasting or satisfactory results.^[9] In the din of novel nonmedical therapies, platelet-rich plasma (PRP) had been tried earlier with unsatisfactory results. A recent trial combining it with NBUVB found better results, but NBUVB itself has superlative results and most clinicians are wary of studies where combinations of a superior mode of therapy are conjoined with a minor intervention.^[10] In

one more study, it was found that PRP alone is not effective in treating vitiligo.^[11] In fact, most topical agents, including tacrolimus (0.1%), calcipotriol, and afamelanotide, are better in combination with NBUVB.^[3,9,12]

There are many issues with the use of PRP in vitiligo, one amongst them is lack of logical mechanistic propositus. How, for example, can a therapy that works in melasma, work for a diametrically opposite disorder such as vitiligo is unexplained.^[13] The proposed mechanism of PRP does not address the main steps in the causation of vitiligo [Table 1]. Probably the method might just work on melanocyte stimulation, but this is conjectural. Also the repeated injections at twice weekly interval are not a very feasible option and arguably a painful option in a real-life scenario, especially as this itself will induce Koebnerization. In addition, it is difficult to comment based on the existing literature on PRP about the ideal site for this intervention. Also PRP does not help the sites that are difficult to pigment including elbows, pressure-bearing area, or acrofacial sites. The results of the medical therapies

Table 1: Overview of the medical therapies in vitiligo with a focus on their effect on pathogenetic steps in the disease^[3-7]

Medical therapy	Melanocytes	T lymphocytes	B lymphocytes	Cytokines(-)	Dendritic cells	Neuropeptides	Inflammasome	Oxidative stress
Corticosteroids	+	+++	++	Tumor necrosis factor (TNF)- α , interferon (IFN)- γ , interleukin (IL)-6, and IL-2	+++	--	--	++
Minocycline	--	--	--			--	--	++
Antioxidants	--	--	--		--	--	--	++
Statins	--	+	+	TNF- α , IFN- γ , IL-6, and IL-2	--	--	--	++
Methotrexate	--	++	--	IFN- γ and IL-2	--	--	--	--
Janus kinase inhibitor	--	++	++	--	--	--	--	--
Rituximab	--	++	+++	--	--	--	--	+
NBUVB, PUVA	+++	++	--	+	+++	++	--	++
Afamelanotide	++	--	--	--	--	--	--	+
Latanoprost	++	++	++	++	--	--	--	
Tacrolimus	++	+++	++	++	++	--	--	+

+ = mild action; ++ = moderate action; +++ = major action; -- = no action

such as mometasone furoate (65%) and tacrolimus (94%) in ideal scenarios are immeasurably better [Table 1].

Phototherapy remains the most effective nonsurgical therapy to date. This is in terms of its multifaceted mode of action, stability of pigment, and lack of significant side effects. A broad scale of intergroup comparison suggests that broad band ultraviolet rays B > NB-UVB = (PUVA/BB-UVA) > psoralen UVA (solar radiation as source of UVA) [PUVA-sol]. In terms of saving health-care resources, PUVA-sol is ideal in a country such as India with abundant sunlight.^[4,8] Pathak *et al.*^[5] had reported in a seminal work that a combination of 0.3mg 8-methoxypsoralen and 0.6mg trimethylpsoralen/kg (60%) achieved 75%–100% repigmentation of the head and neck. The chest, abdomen, and back were repigmented nearly as well and better than the arms and legs. This study is crucial in India not just because of the cost-effectiveness of therapy, but is relevant as in the study of PRP, the exposed sites could have responded, consequent to the sufficient and abundant ambient ultraviolet (UV) flux. We had shown that the results of a drug such as tacrolimus are to be seen in the light of UV exposure in a tropical country such as India. Only a substantial improvement on unexposed sites would be of clinical consequence, which was incidentally observed on mucosal sites with tacrolimus.^[14]

Thus, as PRP has little demonstrable mechanistic effect on the major steps of vitiligo causation, still a lot is to be researched on this measure and we cannot share the enthusiasm of the authors, though for a disorder of vitiligo, there is a need for more modalities, which is the probable rationale of using PRP. As has been the experience of various authors, a combination of phototherapy and medical therapy would eventually be the ideal therapeutic measure wherein, in view of the profound action of phototherapy, this probably may be credited with the therapeutic response.^[6,7,15]

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Conflicts of interest

There are no conflicts of interest.

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