DQ response

Tacrolimus is a topical calcineurin inhibitor and macrolide antibiotic. It is the recommended evidence-based treatment for Vitiligo recommended in a 2015 Cochrane review, the 2013 European Academy of Dermatology and Venereology Guidelines (Rodrigues et al., 2017, Whitton, 2015). Do not use Topical tacrolimus 0.1% in children under 2 and 15 years, use a topical 0.03% solution for children ages 2 to 15 years (ASHSP, n.d.). Drug interactions include dietary restrictions from eating or drinking grapefruit while taking this medication. If you miss a dose, skip it, and continue with your regular schedule.

Adverse effects of Tacrolimus can include hypertension, hyperlipidemia, hyperglycemia, hyperkalemia, alopecia, neurotoxicity (hand tremors, headache, seizures) nephrotoxicity, and risk for infection (Whalen, 2018). There are fewer adverse reactions with topical treatment versus systemic oral treatments. The side effects of the ointment can include skin burning, stinging, redness, soreness, tingling, itching, acne, swollen or infected hair follicles, increase sensitivity to hot/cold temperatures, headache, muscle or back pain, flu-like symptoms, stuffy or runny nose, and nausea (ASHSP, n.d.). Serious side effects that require an immediate call to your doctor include swollen glands, hands, feet, ankles or lower legs, rash, cold sores, crusting, oozing, blistering or other signs of a skin infection.

According to Lee et al. (2019) systematic review and meta-analysis, TCI mechanisms of action can be categorized five different ways. First, as an immune suppressant through the down regulation of proinflammatory cytokines including TNF and induction of inflammatory cytokines such as IL-10 in the vitiligo lesion. Second, as a promotor of melanocyte migration and proliferation through elevated Matrix Metalloproteinase (MMP-2) levels and endothelin B receptor expression on melanoblasts. Third, TCI proliferate and promote melanogenesis by increasing Tyrosinase expression which blocks CD8+ T cell activation and proliferation. Tacrolimus binds to FK-binding proteins and inhibiting the translocation of NFAT transcription factors that lead to the downregulation of IL-2, IL3, IL-4, TNF-alpha and CD40L (Hardinger and Magee, n.d., Lee et al., 20019 and Whalen, 2018). Finally, cyclic treatments of topical tacrolimus reduce oxidative stress (ROS) and improved antioxidant capacity in clinical studies (Lee et al., 2019, p931).

**References:**

American Society of Health-System Pharmacists (ASHSP) (n.d.). Topical tacrolimus. Medline Website. <https://medlineplus.gov/druginfo/meds/a602020.html>

Hardinger, K. and Magee, C. (n.d.) Pharmacology of cyclosporin and tacrolimus. UPTODATE. <https://www.uptodate.com/contents/pharmacology-of-cyclosporine-and-tacrolimus>

Lee, J. H., Kwon, H. S., Jung, H. M., Lee, H., Kim, G. M., Yim, H. W., & Bae, J. M. (2019). Treatment Outcomes of Topical Calcineurin Inhibitor Therapy for Patients with Vitiligo: A Systematic Review and Meta-analysis. JAMA dermatology, 155(8), 929–938. <https://doi.org/10.1001/jamadermatol.2019.0696>

Rodrigues, M., Ezzedine, K., Hamzavi, I., Pandya, A. G., Harris, J. E., & Vitiligo Working Group (2017). Current and emerging treatments for vitiligo. Journal of the American Academy of Dermatology, 77(1), 17–29. <https://doi.org/10.1016/j.jaad.2016.11.010>

Whalen, K. (2018). Lippincott© illustrated reviews: Pharmacology (7th ed.). Wolters Kluwer Health. Chapter 36

Whitton, M. E., Pinart, M., Batchelor, J., Leonardi-Bee, J., González, U., Jiyad, Z., Eleftheriadou, V., & Ezzedine, K. (2015). Interventions for vitiligo. The Cochrane database of systematic reviews, (2), CD003263. https://doi.org/10.1002/14651858.CD003263.pub5