has consistently been reported in AD skin (Tsoi L, et al. *Journal of Investigative Dermatology*. 2019;139(7):1480-1489; Bieber T. *Allergy*. 2020;75(1):54-62) and some reports suggest a relationship between IL-13 expression and the severity of disease (La Grutta S, et al., Allergy 60:391-5, 2005). Increased IL-13 has also been reported in the serum of AD patients (Novak N, et al., J Invest Dermatol 2002;119:870–5; WO2016149276), and several studies have reported an increase in IL-13-expressing T cells in the blood of AD patients (Akdis M, et al., J Immunol 1997;159:4611–9; Aleksza M, et al., Br J Dermatol 2002;147:1135–41; La Grutta S, et al., Allergy 2005;60:391–5).

[0005] The therapeutic approach to AD consists primarily of trigger avoidance, skin hydration with bathing, the use of moisturizers, and anti-inflammatory therapies such as topical corticosteroids (TCS). In many patients, treatment with TCS provides some symptomatic relief but does not always adequately control the disease. In those patients who have persistent moderate-to-severe disease not responding adequately to TCS, the step-up options include topical calcineurin inhibitors (TCNIs), phototherapy, and immunosuppressive agents such as oral corticosteroids, cyclosporine, azathioprine, methotrexate, and mycophenolate mofetil. These medicines are not available for patients across the globe. Amongst these, cyclosporine is approved for treatment of moderate to severe AD in many European countries and its use is limited to patients aged 16 years and over (for a maximum of 8 weeks [NEORAL®]). Cyclosporine is a potent immunosuppressant that could lead to increased susceptibility to infections and decreased cancer immunosurveillance. Other commonly recognized toxicities of cyclosporine include hypertension and impaired renal and hepatic function.

[0006] For childhood AD, the systemic immunosuppressants are often not recommended by current guidelines as they are associated with a substantial risk of side-effects (Chu, *Clin Rev Allergy Immunol*. 2021;61(2):114-127). In addition to the well described safety concerns, poor patient satisfaction with treatment is reportedly common. Less than one third of patients report satisfaction with their current treatment regimens.

[0007] There remains an unmet medical need for safe and effective therapies and treatment regimens for moderate to severe AD in children.

SUMMARY

[0008] Provided herein are methods, uses and pharmaceutical compositions of anti-IL-13 antibodies, such as lebrikizumab, for treating atopic dermatitis in pediatric patients.

Also provided herein are doses and dosing regimens for the methods and uses of anti-IL-13 antibodies, such as lebrikizumab, for treating atopic dermatitis in pediatric patients.

[0009] In one example, provided herein are methods of treating moderate to severe atopic dermatitis in a patient in need thereof, and such methods comprise administering lebrikizumab to the patient, wherein the patient is 6 months to 12 years of age and has a weight of at least 6 kilogram (kg). In some examples, provided herein are methods of treating moderate to severe atopic dermatitis, and such methods comprise: selecting a patient who has moderate to severe atopic dermatitis and is 6 months to 12 years of age and has a weight of at least 6 kg, and administering lebrikizumab to the patient. In some examples, the patient is treated for a treatment period of 16 weeks. During the treatment period, lebrikizumab is administered to the patient at a dose and frequency selected based on the patient's weight. In some examples, when the patient has a weight of 40 kg or greater, lebrikizumab is administered to the patient at 500 mg at Week 0 and Week 2, and 250 mg once every two weeks from Week 4 to Week 14 (e.g., at Week 4, Week 6, Week 8, Week 10, Week 12, Week 14). In some examples, when the patient has a weight of 15 kg to less than 40 kg, lebrikizumab is administered to the patient at 250 mg at Week 0 and 250 mg once every four weeks from Week 2 to Week 14 (e.g., at Week 2, Week 6, Week 10, Week 14). In some examples, when the patient has a weight of 6 kg to less than 15 kg, lebrikizumab is administered at 125 mg at Week 0 and 125 mg once every four weeks from Week 2 to Week 14 (e.g., at Week 2, Week 6, Week 10, Week 14).

[0010] In another example, provided herein are methods of treating moderate to severe atopic dermatitis in a patient in need thereof, and such methods comprise administering lebrikizumab to the patient, wherein the patient is 12 years to 18 years of age and has a weight of less than 40 kg. In some examples, provided herein are methods of treating moderate to severe atopic dermatitis, and such methods comprise: selecting a patient who has moderate to severe atopic dermatitis and is 12 years to 18 years of age and has a weight of less than 40 kg, and administering lebrikizumab to the patient. In some examples, the patient is treated for a treatment period of 16 weeks. During the treatment period, lebrikizumab is administered to the patient at a dose and frequency selected based on the patient's weight. In some examples, when the patient has a weight of 15 kg to less than 40 kg, lebrikizumab is administered to the patient at 250 mg at Week 0 and 250 mg once every four weeks from Week 2 to Week 14 (e.g., at Week 2, Week 6, Week 10, Week 14). In some examples, when the patient has a weight of 6 kg to less than 15 kg, lebrikizumab is administered at 125 mg at

Week 0 and 125 mg once every four weeks from Week 2 to Week 14 (e.g., at Week 2, Week 6, Week 10, Week 14).

[0011] In another example, provided herein are methods of treating moderate to severe atopic dermatitis, and such methods comprising: selecting a patient who has moderate to severe atopic dermatitis and a weight of 6 kg to less than 15 kg, and administering lebrikizumab to the patient at 125 mg at Week 0 and 125 mg once every four weeks from Week 2 to Week 14. In some examples, the patient is 6 months to 12 years of age. In some examples, the patient is 12 years to 18 years of age.

[0012] In another example, provided herein are methods of treating moderate to severe atopic dermatitis, and such methods comprising: selecting a patient who has moderate to severe atopic dermatitis and a weight of 15 kg to less than 40 kg, and administering lebrikizumab to the patient at 250 mg at Week 0 and 250 mg once every four weeks from Week 2 to Week 14. In some examples, the patient is 6 months to 12 years of age. In some examples, the patient is 12 years to 18 years of age.

[0013] In another example, provided herein are methods of treating moderate to severe atopic dermatitis, and such methods comprising: selecting a patient who has moderate to severe atopic dermatitis and a weight of 40 kg or greater, and administering lebrikizumab to the patient at 500 mg at Week 0 and Week 2, and 250 mg once every two weeks from Week 4 to Week 14. In some examples, the patient is 6 months to 12 years of age.

[0014] In some examples, the patient has an Eczema Area and Severity Index (EASI) score of 16 or greater, an Investigator Global Assessment (IGA) score of 3 or greater, and more than 10% of body surface area (BSA) affected by atopic dermatitis, before administration of lebrikizumab. In some examples, the patient had inadequate response to topical corticosteroids before administration of lebrikizumab. In some examples, the patient has atopic dermatitis for at least 12 months when the patient is 6 years of age or older. In some examples, the patient has atopic dermatitis for at least 6 months when the patient is 6 months to less than 6 years of age.

[0015] In some examples, the methods further comprise determining the EASI score of the patient after the treatment period, e.g., at Week 16. In some examples, the EASI score determined after the treatment period, e.g., at Week 16, is reduced by 75% or greater compared to the EASI score determined prior to administration of lebrikizumab. In some examples, the EASI score determined after the treatment

period, e.g., at Week 16, is reduced by 90% or greater compared to the EASI score determined prior to administration of lebrikizumab.

[0016] In some examples, the methods further comprise determining the IGA score of the patient after the treatment period, e.g., at Week 16. In some examples, the IGA score determined after the treatment period, e.g., at Week 16, is 0 or 1 and the IGA score determined after the treatment period, e.g., at Week 16, is reduced by 2 points or greater compared to the IGA score determined prior to administration of lebrikizumab.

[0017] In some examples, the methods further comprise determining the Pruritus numeric rating scale (NRS) score of the patient after the treatment period, e.g., at Week 16. In some examples, the Pruritus NRS score determined after the treatment period, e.g., at Week 16, is reduced by 4 points or greater compared to the Pruritus NRS score determined prior to administration of lebrikizumab.

[0018] In some examples, the methods further comprise determining one or more of the following characteristics of the patient at Week 16: (i) percentage of BSA affected by atopic dermatitis; (ii) DLQI, cDLQI, and/or IDLQI; (iii) PRISM; (iv) SCORAD; (v) PROMIS Anxiety, PROMIS Depression, PROMIS Sleep Disturbance, and/or PROMIS Sleep-Related Impairment; (vi) POEM; (vii) EQ-5D-Y and/or EQ-5D-5L; (viii) mSQAAQ; (ix) DFI; (x) WPAI-AD-CG.

[0019] In some examples, lebrikizumab is administered subcutaneously to the patient. In some examples, lebrikizumab is administered to the patient using a subcutaneous administration device, e.g., a prefilled syringe, disposable pen injection device, microneedle device, microinfuser device, needle-free injection device, or autoinjector device.

[0020] In another example, provided herein are lebrikizumab, or pharmaceutical composition comprising lebrikizumab, for use in treating moderate to severe atopic dermatitis in a patient who is 6 months to 12 years of age and has a weight of at least 6 kg. Also provided are uses of lebrikizumab in the manufacture of a medicament for treating moderate to severe atopic dermatitis in a patient who is 6 months to 12 years of age and has a weight of at least 6 kg.

[0021] In another example, provided herein are lebrikizumab, or pharmaceutical composition comprising lebrikizumab, for use in treating moderate to severe atopic dermatitis in a patient who is 12 years to 18 years of age and has a weight of less than 40 kg. Also provided are uses of lebrikizumab in the manufacture of a medicament for treating

moderate to severe atopic dermatitis in a patient who is 12 years to 18 years of age and has a weight of less than 40 kg.

[0022] In another example, provided herein are lebrikizumab, or pharmaceutical composition comprising lebrikizumab, for use in treating moderate to severe atopic dermatitis in a patient who has a weight of 6 kg to less than 15 kg. Also provided are uses of lebrikizumab in the manufacture of a medicament for treating moderate to severe atopic dermatitis in a patient who has a weight of 6 kg to less than 15 kg. In some examples, lebrikizumab is to be administered to such patient at 125 mg at Week 0 and 125 mg once every four weeks from Week 2 to Week 14. In some examples, the patient is 6 months to 12 years of age. In some examples, the patient is 12 years to 18 years of age.

[0023] In another example, provided herein are lebrikizumab, or pharmaceutical composition comprising lebrikizumab, for use in treating moderate to severe atopic dermatitis in a patient who has a weight of 15 kg to less than 40 kg. Also provided are uses of lebrikizumab in the manufacture of a medicament for treating moderate to severe atopic dermatitis in a patient who has a weight of 15 kg to less than 40 kg. In some examples, lebrikizumab is to be administered to such patient at 250 mg at Week 0 and 250 mg once every four weeks from Week 2 to Week 14. In some examples, the patient is 6 months to 12 years of age. In some examples, the patient is 12 years to 18 years of age.

[0023a] In an aspect, provided herein is use of lebrikizumab in the manufacture of a medicament for treating moderate to severe atopic dermatitis in a patient having a body weight of at least 6 kg and less than 40 kg, wherein the lebrikizumab is to be administered to the patient at a dose of:

(a) 125 mg, when the patient has a body weight of 6 kg to less than 15 kg; or

(b) 250 mg, when the patient has a body weight of 15 kg to less than 40 kg,

wherein the said dose is to be administered at Week 0 and once every four weeks from Week 2 to Week 14.

[0024] In another example, provided herein are lebrikizumab, or pharmaceutical composition comprising lebrikizumab, for use in treating moderate to severe atopic dermatitis in a patient who has a weight of 40 kg or greater. Also provided are uses of lebrikizumab in the manufacture of a medicament for treating moderate to severe atopic dermatitis in a patient who has a weight of 40 kg or greater. In some examples, lebrikizumab is to be administered to such patient at 500 mg at

Week 0 and Week 2, and 250 mg once every two weeks from Week 4 to Week 14. In some examples, the patient is 6 months to 12 years of age.

[0025] In some examples, the methods, uses, and pharmaceutical compositions described herein further comprise administrating one or more topical corticosteroids to the patient. In some examples, the topical corticosteroid is triamcinolone acetonide, hydrocortisone, or a combination of triamcinolone acetonide and hydrocortisone. In some examples, the topical corticosteroid is administered concomitantly with lebrikizumab.

CLAIMS

1. Use of lebrikizumab in the manufacture of a medicament for treating moderate to severe atopic dermatitis in a patient having a body weight of at least 6 kg and less than 40 kg, wherein the lebrikizumab is to be administered to the patient at a dose of:
   (a) 125 mg, when the patient has a body weight of 6 kg to less than 15 kg; or
   (b) 250 mg, when the patient has a body weight of 15 kg to less than 40 kg,
   wherein the said dose is to be administered at Week 0 and once every four weeks from Week 2 to Week 14.

2. The use according to claim 1, wherein the patient has a body weight of 6 kg to less than 15 kg, and lebrikizumab is to be administered at 125 mg at Week 0 and 125 mg once every four weeks from Week 2 to Week 14.

3. The use according to claim 1, wherein the patient has a body weight of 15 kg to less than 40 kg, and lebrikizumab is to be administered at 250 mg at Week 0 and 250 mg once every four weeks from Week 2 to Week 14.

4. The use according to any one of claims 1 to 3, wherein the patient is 6 months to 12 years of age.

5. The use according to any one of claims 1 to 3, wherein the patient is 12 years to 18 years of age.

6. The use according to any one of claims 1 to 5, wherein the patient is to be treated for a treatment period of 16 weeks.

7. The use according to any one of claims 1 to 6, wherein the lebrikizumab is to be administered subcutaneously to the patient.

8. The use according to claim 7, wherein the lebrikizumab is to be administered using a subcutaneous administration device selected from a prefilled syringe, a disposable pen injection device, a microneedle device, a microinfuser device, a needle-free injection device and an autoinjector device.

9. The use according to any one of claims 1 to 8, wherein the patient has, before administration of lebrikizumab, an Eczema Area and Severity Index (EASI) score of 16 or greater, an Investigator Global Assessment (IGA) score of 3 or greater, and more than 10% of body surface area (BSA) affected by atopic dermatitis.

10. The use according to any one of claims 1 to 9, wherein the patient had an inadequate response to topical corticosteroids before administration of lebrikizumab.

11. The use according to any one of claims 1 to 10, wherein the patient is 6 years of age or older and has had atopic dermatitis for at least 12 months.

12. The use according to any one of claims 1 to 4 or 6 to 10, wherein the patient is 6 months to less than 6 years of age and has had atopic dermatitis for at least 6 months.

13. The use according to any one of claims 1 to 12, wherein the EASI score of the patient determined at Week 16 is to be reduced by 75% or greater compared with the EASI score determined prior to administration of lebrikizumab.

14. The use according to claim 13, wherein the EASI score of the patient determined at Week 16 is to be reduced by 90% or greater compared with the EASI score determined prior to administration of lebrikizumab.

15. The use according to any one of claims 1 to 14, wherein the IGA score of the patient determined at Week 16 is 0 or 1 and is to be reduced by 2 points or greater compared with the IGA score determined prior to administration of lebrikizumab.

16. The use according to any one of claims 1 to 15, wherein the Pruritus Numeric Rating Scale (NRS) score of the patient determined at Week 16 is to be reduced by 4 points or greater compared with the Pruritus NRS score determined prior to administration of lebrikizumab.

17. The use according to any one of claims 1 to 16, wherein one or more topical corticosteroids is to be administered to the patient concomitantly with lebrikizumab.

18. The use according to claim 17, wherein the one or more topical corticosteroids is triamcinolone acetonide, hydrocortisone, or a combination of triamcinolone acetonide and hydrocortisone.