NIHR | Innovation Observatory

HEALTH TECHNOLOGY BRIEFING SEPTEMBER 2021

Ritlecitinib for alopecia areata

NIHRIO ID	13710	**NICE ID**	10419
Developer/Company	Pfizer Limited (UK)	**UKPS ID**	655014

Licensing and market availability plans	Currently in phase III clinical trials.

SUMMARY

Ritlecitinib is in clinical development for the treatment of patients with alopecia areata (AA). AA is a disease that develops when the body attacks its own hair follicles (where the hair grows from), which can cause hair loss as small round patches of baldness anywhere on the body. Most commonly, this occurs on the scalp and has high rates of recurrence. There are also psychological implications such as increased levels of anxiety and depression in people with AA.

Ritlecitinib is an inhibitor of proteins called janus kinases (JAKs) and is administered orally. JAKs play a major role in signalling for hair follicle growth, specifically JAK inhibitors impede the immune system (the body's defence against germs), including pathways involved in antiviral immunity, which appear to be active in AA. If licensed, ritlecitinib would offer an additional treatment option for those with AA.

PROPOSED INDICATION

Treatment of adolescent and adult patients with alopecia areata (AA) including alopecia totalis (AT) and universalis (AU).[1]

TECHNOLOGY

DESCRIPTION

Ritlecitinib (PF-06651600, JAK3/TEC) is in the class of covalent kinase inhibitors that have high selectivity for Janus kinase 3 (JAK3) and members of the tyrosine kinase expressed in hepatocellular carcinoma (TEC) kinase family.[2] JAK3 is essential for signal transduction of cytokines utilizing the common γ chain (CD132/γC) and its absence results in immunodeficiency. Thus, it has been assumed that specific inhibition of JAK3 kinase function would have therapeutic potential as a selective and safe immunosuppressive principle.[3] Janus kinase inhibitors can selectively act on the pathogenesis of alopecia areata by inhibiting the JAKSTAT pathway which commonly mediates the signal transduction of cytokines that play a key role in the autoimmune mechanism. Furthermore, the application of JAK inhibitors to healthy mouse and human tissue regulates the activation of hair germs and subsequently induces anagen onset and hair growth.[4]

Ritlecitinib is currently in phase II and III clinical development for treatment of adolescents and adults (⩾12 years old) with AA (NCT04517864; NCT04006457; NCT03732807).[1,2,5,6] During the NCT03732807 trials, patients were randomized to receive ritlecitinib 50 mg or 30 mg (with or without one month of initial treatment with once-daily ritlecitinib 200 mg), ritlecitinib 10 mg or placebo.[2]

INNOVATION AND/OR ADVANTAGES

Ritlecitinib is the first in a new investigational class of covalent kinase inhibitors that have high selectivity for JAK3 and TEC kinases.[2] As ritlecitinib is selective for JAK3 only, it has the potential to offer better anti-inflammatory properties as compared to inhibiting signalling of a broader spectrum of cytokines with JAK1 inhibitors.[7]

The phase 2b/3 ALLEGRO trial met the primary efficacy endpoint of improving scalp hair regrowth. All participants entered the study with at least 50 percent scalp hair loss due to alopecia areata, as measured by the Severity of Alopecia Tool (SALT) score. A statistically significantly greater proportion of patients who took ritlecitinib 30 mg or 50 mg once-daily, with or without a four-week initial treatment of 200 mg once-daily, had 20 percent or less scalp hair loss (an absolute SALT score ⩽20) after 24 weeks of treatment compared with placebo.[2]

DEVELOPMENT STATUS AND/OR REGULATORY DESIGNATIONS

Ritlecitinib does not currently have Marketing Authorisation in the EU/UK for any indication.

Ritlecitinib was granted Breakthrough Therapy designation from the U.S. FDA for the treatment of AA in September 2018.[2]

Ritlecitinib is currently in phase II/III clinical development for:[8]

- Crohn's disease
- Rheumatoid arthritis

- Ulcerative colitis
- Non-segmental vitiligo

PATIENT GROUP

DISEASE BACKGROUND

AA is a complex genetic, immune mediated disease that target anagen hair follicles, although the hair follicle does not usually sustain permanent damage and maintains its potential to regrow hair.[9] This polygenic autoimmune disease causes hair loss that can range from circular patches on the scalp to complete hair loss.[10] AA is a chronically relapsing inflammatory disorder, like most other autoimmune diseases which suggests a cyclic recurrence of disease-promoting events.[11] Due to the chronic relapsing-remitting nature and pathophysiology of AA, it is notoriously difficult to manage and study in clinical trials.[12]

Collapse of the anagen hair bulb immune privilege may play a crucial part in the pathogenesis of AA.[11] The target antigen is still not clearly defined, however, melanocytes are often targeted by the immune system and are involved during the active pigment production phase of the anagen phase of the hair cycle. It is suggested that downregulation of major histocompatibility complex (MHC) class I expression in anagen hair bulbs sequesters autoantigens from being presented to CD8+ T-cells. Additionally, local production of immunosuppressant molecules such as transforming growth factor (TGF)-β1, interleukin (IL)-10, and α-melanocyte-stimulating hormone (MSH) are thought to contribute to this immune privilege.[12]

Triggers such as stress/trauma to the skin can cause increased intrafollicular secretion of interferon (IFN)-γ, which induces T helper (Th)1 chemokines CXC motif ligand 10 MHC class I expression leading to cytotoxic T (Tc)1 and Th1 cells accumulating around hair bulbs. This leads to immune privilege loss and the autoimmune attack of anagen follicles results in prematurely entering the catagen phase. Furthermore, animal models show that the production of IFN-γ signals, via JAK1 and JAK2, to stimulate production of IL-15 in the hair follicle. IL-15 binds to CD8+ T cells, further stimulating JAK1 and JAK3 to produce IFN-γ. Human studies show an overexpression of IFN-γ, JAK1, JAK2, and to a greater extent JAK3.[12]

One of the major concerns with AA patients is the increased likelihood of higher anxiety and depression levels, combined with lower self-esteem, poorer quality of life, and poorer body image.[13]

Currently, there is no cure and whilst complete regrowth can occur within a year without treatment, further episodes of hair loss can occur in the future. Additionally, if there is extensive hair loss from the start, the chances of it regrowing are not as good. For example, those with more than half of their hair lost at the start of the condition or with complete hair loss at any stage have an approximate 1 in 10 chance of full recovery. The chances of regrowth are also smaller in young children and those with the condition affecting the hairline at the front, back or side.[14]

CLINICAL NEED AND BURDEN OF DISEASE

AA affects up to 2% of the general population.[12] In the UK it is estimated to affect approximately 15 in 10,000 people.[15] Based on the 2020 estimate of the UK population, AA is estimated to affect 100,622 people.[15,16]

A recent population-based study in the UK demonstrated that the onset of AA was observed at all ages, and peaked between ages 25-29. It was slightly more common in females and was

also more common in people living in deprived areas and in urban areas. The frequency was higher in non-white ethnic groups, particularly in those of Asian backgrounds where it was three times as common as in those of white ethnicity.[17]

Hospital Episodes Statistics for England for the period of 2019-2020 recorded a total of 159 finished consultant episodes (FCEs), 159 admissions of which 156 were day cases and 3 FCE bed days for the primary diagnosis of AA (ICD-10 Code L63).[18]

PATIENT TREATMENT PATHWAY

TREATMENT PATHWAY

NICE suggests for management purposes that the natural history of the condition and treatment options be discussed. Discuss whether treatment is required based on regrowth or lack thereof. If treatment is an option, this may be done on a 3-month trial basis. Additionally, cosmetic options for camouflaging hair loss should be discussed (e.g., wigs). Referral to a dermatologist should be arranged if hair loss does not respond to treatment in primary care or if treatment is declined, the diagnosis is uncertain, or a child, pregnant or breastfeeding woman is affected.[19]

Common treatment pathways include the use of local steroid injections, which can be used on the scalp and brows (most effective on small patches of hair loss). Injections can be repeated every four to six weeks and are stopped once regrowth is achieved. Special care must be taken around the eyes as injecting too much may cause glaucoma. Steroid tablets, large doses may result in hair regrowth. However, when the treatment stops AA often recurs. There are many possible side effects including raised blood pressure, diabetes, stomach ulcers, cataracts, and osteoporosis. Contact sensitisation treatment where a patient is made allergic to a substance (usually diphencyprone) and this is then applied in very weak strengths to the bald patches, commonly once a week. Depigmentation can occur and it must be used with caution in those with dark skin. This treatment is only available in specialised centres. Ultraviolet light treatment (PUVA) could be utilised, which involves taking a tablet or applying cream that makes the skin sensitive to light, then exposing the bald patches to ultraviolet (UV) light (two or three times a week). Relapse of AA is common when treatment is stopped and there is a possible long-term risk of skin cancers.[14]

CURRENT TREATMENT OPTIONS

For AA treatment the British Association of Dermatologists (BAD) and Alopecia UK recommend the following:[14,20]

- Topical corticosteroids (creams and scalp applications) applied to the bald patches (usually twice a day for a limited time).
- Intralesional corticosteroids (local steroid injections); such as hydrocortisone acetate and triamcinolone acetonide.
- Systemic corticosteroids (steroid tablets or injection into the muscle); such as oral prednisolone or intramuscular triamcinolone acetonide.
- Dithranol (anthralin) cream may stimulate some hair growth, although the evidence is weak.
- Contact immunotherapy (sensitisation treatment); such exposure to diphenylcyclopropenone (DPCP) to cause a local allergic reaction and stimulate hair growth.
- Minoxidil lotion, which is available over the counter, can be applied to bald patches and may help some people but the hair is often fine.

- Immunosuppressant tablets, including sulfasalazine, methotrexate, ciclosporin, and azathioprine. They suppress the immune system and are occasionally used to treat severe AA which is unresponsive to other treatments. Evidence is limited and severe side effects can occur.
- Prostaglandin analogs, including eye drops, latanoprost and bimatoprost (which may cause hair growth on the eyelids), further studies are needed to confirm its effect on scalp AA.

Some of the above mentioned treatment options are off-label.[21] Additionally, the use of systemic corticosteroids is usually avoided as they can cause serious side effects.[20]

PLACE OF TECHNOLOGY

If licensed, ritlecitinib would offer an alternative treatment option for patients with AA.

CLINICAL TRIAL INFORMATION

Trial	**ALLEGRO-LT; NCT04006457; 2019-001084-71;** A Phase 3 Open-Label, Multi-Center, Long-Term Study Investigating the Safety and Efficacy of PF-06651600 in Adult and Adolescent Participants with Alopecia Areata **Phase III**- Recruiting **Location(s):** 4 EU countries, UK, USA, Canada, and other countries **Primary completion date:** July 2024
Trial design	Non-randomised, parallel assignment, open label, multicenter
Population	N = 960, patients with a clinical diagnosis of AA with no other cause of hair loss, patients aged 12 years and older
Intervention(s)	• 200 mg ritlecitinib, given as four 50 mg tablets once daily (QD) for 1 month, followed by 50 mg ritlecitinib given QD for 35 months. • 50 mg ritlecitinib given QD for 36 months.
Comparator(s)	No comparator
Outcome(s)	Primary outcomes: • Number of subjects reporting treatment-emergent adverse events [Time Frame: Baseline through Month 36] • Number of subjects reporting serious adverse events [Time Frame: Baseline through Month 36] • Number of subjects reporting adverse events leading to discontinuation [Time Frame: Baseline through Month 36] • Number of subjects with clinically significant abnormalities in vital signs [Time Frame: Baseline through Month 36] • Number of subjects with clinically significant abnormalities in clinical laboratory values [Time Frame: Baseline through Month 36] • Vaccine sub-study: Percentage of subjects with a tetanus booster response [Time Frame: Vaccine sub-study Month 1] See trial record for full list of other outcomes

Results (efficacy)	-
Results (safety)	-

Trial	**ALLEGRO-2b/3; NCT03732807; 2018-001714-14;** A Phase 2B/3 Randomized, Double-Blind, Placebo-Controlled, Dose-Ranging Study to Investigate the Efficacy and Safety of PF-06651600 in Adult and Adolescent Alopecia Areata (AA) Subjects with 50% or Greater Scalp Hair Loss **Phase III** - Completed **Location(s):** 5 EU countries, UK, USA, Canada, and other countries **Study completion date:** June 2021
Trial design	Randomised, double-blind, placebo-controlled, dose-ranging, parallel assignment, quadruple masking
Population	N = 718, patients with a clinical diagnosis of alopecia areata with no other cause of hair loss, patients aged 12 years and older
Intervention(s)	• Induction doses given QD for 4 weeks followed by maintenance doses given QD for up to 48 weeks across 5 experimental arms
Comparator(s)	Matched placebo
Outcome(s)	• Percentage of subjects achieving an absolute Severity of Alopecia Tool (SALT) Score <=20 (For Overall Study Reporting/FDA/PMDA) [Time Frame: Week 24] • Percentage of subjects achieving an absolute Severity of Alopecia Tool (SALT) Score <=10 (For EMA/VHP Countries) [Time Frame: Week 24] See trial record for full list of other outcomes
Results (efficacy)	Topline results show a statistically significantly greater proportion of patients who took ritlecitinib 30 mg or 50 mg once-daily, with or without a four-week initial treatment of 200 mg once-daily, had 20 percent or less scalp hair loss (an absolute SALT score $\leqslant 20$) after 24 weeks of treatment compared with placebo.[2]
Results (safety)	The safety profile seen with ritlecitinib was consistent with previous studies. Overall, the percentage of patients with adverse events (AEs), serious AEs and discontinuing due to AEs was similar across all treatment groups. The most common AEs seen in the study were nasopharyngitis, headache and upper respiratory tract infection. There were no major adverse cardiac events (MACE), deaths or opportunistic infections in the trial. Eight patients who were treated with ritlecitinib developed mild to moderate herpes zoster (shingles). There was one case of pulmonary embolism in the ritlecitinib 50 mg group, which was reported to have occurred on Day 169. There were two malignancies (both breast cancers) reported in the ritlecitinib 50 mg group, which were reported to have occurred on Day 68 and Day 195. Both participants were discontinued from the study.[2]

Trial	**Allegro2a; NCT04517864; 2020-001509-21;** A Phase 2a, Randomized, Double-Blind, Placebo Controlled Study Investigating the Safety of Ritlecitinib (PF-06651600) in Adult Participants with Alopecia Areata **Phase II** – Active, not recruiting **Location(s):** 1 EU country, USA, Canada, and Australia. **Primary completion date:** December 2021
Trial design	Randomised, parallel assignment, triple masking, double-blind, placebo-controlled
Population	N = 70, patients with a diagnosis of AA, including AT and AU, patients aged between 18 years to 50 years
Intervention(s)	Ritlecitinib 200 mg QD (four 50 mg tablets) for 4 weeks then ritlecitinib 50 mg tablet QD through month 24
Comparator(s)	Matched placebo
Outcome(s)	Change from baseline in I-V interwave latency on brainstem auditory evoked potential (BAEP) at a stimulus intensity of 80 decibels (dB) at Month 9. [Time Frame: Baseline, Month 9] See trial record for full list of other outcomes
Results (efficacy)	-
Results (safety)	-

Trial	**NCT02974868; 2016-004048-13**, A Phase 2A Randomized, Double-Blind, Placebo-Controlled, Multicenter Study to Evaluate the Efficacy and Safety Profile of PF-06651600 and PF-06700841 in Subjects with Moderate to Severe Alopecia Areata with a Single-Blind Extension Period and a Cross-Over Open Label Extension Period **Phase II** - Completed **Location(s):** USA, Canada, and Australia **Study completion date:** May 2019
Trial design	Randomised, double-blind, placebo-controlled, multicenter, triple masking
Population	N = 142, patients with moderate to severe alopecia areata , patients aged between 18 years to 75 years
Intervention(s)	• Ritlecitinib 200 mg QD during induction and 50 mg QD during maintenance • Breprocitinib 60 mg QD during induction and 30 mg QD during maintenance
Comparator(s)	Matched placebo
Outcome(s)	Primary outcomes: • Change From Baseline in SALT Score at Week 24 [Time Frame: Baseline, Week 24] • Number of Participants With Treatment-emergent Adverse Events (All-causality and Treatment-related) - Single-Blind Extension (SBE) Period [Time Frame: Week 28 up to Week 52] • Number of Participants With Treatment-emergent Adverse Events (All-causality and Treatment-related)

	- Cross-Over Extension (COE) Period [Time Frame: COE day 1 up to end of study] • Number of Participants With Laboratory Abnormalities During SBE Period [Time Frame: Week 28 up to Week 52 for non-responders and responders in the withdrawal segment, AT day 1 up to AT Week 24 for retreatment segment (AT=active treatment)] • Numbers of Participants With Specific Clinical Laboratory Abnormalities During COE Period [Time Frame: COE day 1 up to end of study] See trial record for full list of other outcomes
Results (efficacy)	At week 24, least-squares mean difference from placebo in SALT score change from baseline was 31.1 (95% confidence interval [CI], 18.8-43.5) for ritlecitinib and 49.2 (95% CI, 36.6-61.7) for brepocitinib (P < 0.0001 for both comparisons with placebo). SALT30 was achieved by 50% (90% CI, 38%-62%) of patients receiving ritlecitinib, 64% (90% CI, 51%-75%) receiving brepocitinib, and 2% (90% CI, 0%-9%) receiving placebo.[22]
Results (safety)	AEs were reported in 35 of 47 (74%), 32 of 48 (67%), and 36 of 47 (77%) of patients in the placebo, ritlecitinib, and brepocitinib groups, respectively. The most common AEs were upper respiratory tract infection, nasopharyngitis, head-ache, acne, and nausea. There were no cases ofopportunistic infections. Two patients receiving brepocitinib experienced the serious AE of rhabdo-myolysis not accompanied by acute kidney injury; both were preceded by strenuous physical activity and resolved without sequelae. AEs that led to study drug discontinuation occurred in 3 (6%), 2 (4%), and 4 (9%) patients in the placebo, ritlecitinib, andbrepocitinib groups, respectively.In all 3 treatment groups, there were noclinically relevant changes from baseline in haematology tests, electrocardiogram findings, or vital signs.[22]

ESTIMATED COST

The cost of ritlecitinib is not yet known.

RELEVANT GUIDANCE

NICE GUIDANCE

No relevant guidance identified.

NHS ENGLAND (POLICY/COMMISSIONING) GUIDANCE

- 2013/14 NHS Standard Contract For Specialised Dermatology Services (All Ages). A12/S/a.

OTHER GUIDANCE

- Ramos PM; Anzai A; Duque-Estrada B; et al. Consensus on the treatment of alopecia areata - Brazilian Society of Dermatology. November-December 2020.[23]
- Rossi A; Muscianese M; Piraccini BM; et al. Italian Guidelines in diagnosis and treatment of alopecia areata. 2019.[24]
- Messenger AG; McKillop, J; Farrant P; et al. British association of dermatologists' guidelines for the management of alopecia areata. 2012.[25]

ADDITIONAL INFORMATION

REFERENCES

1 ClinicalTrials.gov. *PF-06651600 for the Treatment of Alopecia Areata (ALLEGRO-2b/3). Trial ID: NCT03732807*. 2018. Status: Completed. Available from: https://clinicaltrials.gov/ct2/show/record/NCT03732807 [Accessed 25th Aug 2021].

2 Pfizer. *Pfizer Announces Positive Top-Liner Results from Phase 2B/3 Trial of Ritlecitinib in Alopecia Areata.* 2021. Available from: https://www.pfizer.com/news/press-release/press-release-detail/pfizer-announces-positive-top-line-results-phase-2b3-trial [Accessed 25th Aug 2021].

3 Thoma G, Nuninger F, Falchetto R, Hermes E, Tavares G, Vangrevelinghe E, et al. Identification of a Potent Janus Kinase 3 Inhibitor with High Selectivity within the Janus Kinase Family. *J Med Chem*. 2010;54(1):284-8. Available from: https://doi.org/10.1021/jm101157q

4 Park H, Yu D, Kwon O. Janus kinase inhibitors: An innovative treatment for alopecia areata. *The Journal of Dermatology*. 2019;46(8):724-30. Available from: https://doi.org/10.1111/1346-8138.14986

5 ClinicalTrials.gov. *Placebo-Controlled Safety Study of Ritlecitinib (PF-06651600) in Adults with Alopecia Areata (Allegro2a). Trial ID: NCT04517864. Trial ID: 24 Aug*. 2020. Status: 2021. Available from: https://clinicaltrials.gov/ct2/show/NCT04517864 [Accessed 25th Aug 2021].

6 ClinicalTrials.gov. *Long-Term PF-06651600 for the Treatment of Alopecia Areata (ALLEGRO-LT). Trial ID: NCT04006457. Trial ID: 24 Aug*. 2019. Status: 2021. Available from: https://clinicaltrials.gov/ct2/show/study/NCT04006457 [Accessed 25th Aug 2021].

7 Telliez J, Dowty M, Wang L, Jussif J, Lin T, Li L, et al. Discovery of a JAK3-Selective Inhibitor: Functional Differentiation of JAK3-Selective Inhibition over pan-JAK or JAK1-Selective Inhibition. *ACS Chem Biol*. 2016;11(12):3442-51. Available from: https://doi.org/10.1021/acschembio.6b00677

8 ClinicalTrials.gov. *PF-06651600 | Recruiting, Not yet recruiting, Active, not recruiting, Enrolling by invitation Studies | Phase 2, 3*. Available from: https://clinicaltrials.gov/ct2/results?term=PF-06651600&Search=Apply&recrs=b&recrs=a&recrs=f&recrs=d&age_v=&gndr=&type=&rslt=&phase=1&phase=2 [Accessed 25th Aug 2021].

9 Hordinsky M. Overview of Alopecia Areata. *Journal of Investigative Dermatology Symposium Proceedings*. 2013;16(1):PS13-S5. Available from: https://doi.org/10.1038/jidsymp.2013.4

10 Jabbari A, Dai Z, Xing L, Cerise J, Ramot Y, Berkun Y, et al. Reversal of Alopecia Areata Following Treatment With the JAK1/2 Inhibitor Baricitinib. *EBioMedicine*. 2015;2(4):351-5. Available from: https://doi.org/10.1016/j.ebiom.2015.02.015

11 Kulkarni S, Punia R, Kundu R, Thami G, Mohan H. Direct Immunofluorescence Pattern and Histopathological Staging in Alopecia Areata. *Int J Trichology*. 2014;6(4):164-7. Available from: https://doi.org/10.4103/0974-7753.142859

12 Pourang A, Mesinkovska N. New and Emerging Therapies for Alopecia Areata. *Drugs*. 2020;80:635-46. Available from: https://doi.org/10.1007/s40265-020-01293-0

13 Hunt N, McHale S. The psychological impact of alopecia. *BMJ*. 2005;331:951. Available from: https://doi.org/10.1136/bmj.331.7522.951

14 British Association of Dermatologists. *Alopecia Areata.* Available from: https://www.bad.org.uk/for-the-public/patient-information-leaflets/alopecia-areata/?showmore=1#.YSUh_Y5Kg2x [Accessed 25th Aug 2021].

15 Tidy C. *Alopecia Areata.* 2020. Available from: https://patient.info/skin-conditions/alopecia-areata [Accessed 25th Aug 2021].
16 Office for National Statistics (ons). *Population estimates.* 2021. Available from: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates [Accessed 25th Aug 2021].
17 Harries M, Macbeth AE, Holmes S, Chiu WS, Gallardo WR, Nijher M, et al. The epidemiology of alopecia areata: a population-based cohort study in UK primary care. *British Journal of Dermatology*. 2021. Available from: https://doi.org/https://doi.org/10.1111/bjd.20628.
18 NHS Digital. *Hospital Admitted Patient Care Activity 2019-20: Diagnosis.* 2020. Available from: https://digital.nhs.uk/data-and-information/publications/statistical/hospital-admitted-patient-care-activity/2019-20 [Accessed 25th Aug 2021].
19 National Institute for Health and Care Excellence (NICE). *Alopecia areata.* 2018. Available from: https://cks.nice.org.uk/topics/alopecia-areata/ [Accessed 25th Aug 2021].
20 Alopecia UK. *Common Treatments for Alopecia Areata.* Available from: https://www.alopecia.org.uk/faqs/common-treatments-for-alopecia-areata [Accessed 25th Aug 2021].
21 Hordinsky MK. Current Treatments for Alopecia Areata. *J Investig Dermatol Symp Proc*. 2015 Nov;17(2):44-6. Available from: https://doi.org/10.1038/jidsymp.2015.41.
22 King B, Guttman-Yassky E, Peeva E, Banerjee A, Sinclair R, Pavel AB, et al. A phase 2a randomized, placebo-controlled study to evaluate the efficacy and safety of the oral Janus kinase inhibitors ritlecitinib and brepocitinib in alopecia areata: 24-week results. *J Am Acad Dermatol*. 2021 Aug;85(2):379-87. Available from: https://doi.org/10.1016/j.jaad.2021.03.050.
23 Ramos P, Anzai A, Duque-Estrada B, Melo D, Sternberg F, Santos L, et al. Consensus on the treatment of alopecia areata – Brazilian Society of Dermatology. *Anais Brasileiros de Dermatologia*. 2020;95:39-52. Available from: https://doi.org/10.1016/j.abd.2020.05.006
24 Rossi A, Muscianese M, Piraccini B, Starace M, Carlesimo M, Mandel V, et al. Italian Guidelines in diagnosis and treatment of alopecia areata. *G Ital Dermatol Venereol*. 2019;154:609-23. Available from: https://doi.org/10.23736/S0392-0488.19.06458-7
25 Messenger A, McKillop J, Farrant P, McDonagh A, Sladden M. British Association of Dermatologists' guidelines for the management of alopecia areata 2012. *British Journal of Dermatology*. 2012;166(5):916-26. Available from: https://doi.org/10.1111/j.1365-2133.2012.10955.x

NB: This briefing presents independent research funded by the National Institute for Health Research (NIHR). The views expressed are those of the author and not necessarily those of the NHS, the NIHR or the Department of Health.