Food allergy occurs when the body's immune system reacts unusually to specific foods. Peanuts are one of the most common causes of food allergy. Symptoms of peanut allergy include: having an itchy mouth, developing a rash, bodily swelling, difficulty swallowing, wheezing or shortness of breath, feeling dizzy or light headed, feeling sick, abdominal pain and hay fever-like symptoms.

The prevalence of food allergy in Europe and North America has been reported to range from 6% to 8% in children up to the age of 3 years. Prevalence in adults has been estimated at 1 to 2%.

AR101 is a form of treatment for peanut allergy. This treatment is administered orally with the aim of re-educating the body's immune system, in order to increase the level at which the body reacts to peanuts, or to reduce the allergic response. The drug is targeted at adults and children with severe peanut allergy.

Phase III clinical trials are currently being conducted in adults and children.

A peanut desensitisation service is not currently provided by the NHS.
TARGET GROUP

Adults and children with severe peanut allergy.

TECHNOLOGY

DESCRIPTION

AR101 is a form of oral immunotherapy for the treatment of peanut hypersensitivity (peanut allergy). This treatment contains the protein profile found in peanuts. A very small amount of an allergen (insufficient to cause a reaction) is administered in a gradual, controlled, up-dosing manner (with ongoing daily maintenance) until de-sensitisation to a certain amount of the allergen has been achieved. This process can re-educate the body’s immune system, increasing the threshold of reactivity to an allergen or diminishing the allergic response.

An on-going phase III clinical trial aims to evaluate the safety and efficacy of AR101 for desensitising peanut-allergic patients to a level sufficient to reliably protect them from allergic reactions upon accidental exposures to peanuts. In this trial, AR101 is administered orally in capsules and sachets using a dose escalation method for a period of approximately 22 weeks, to reach the maintenance dose of 300 mg per day. Subsequently, participants continue with daily maintenance at 300 mg per day for approximately six months. At the end of the maintenance period, patients will undergo an exit double-blind, placebo-controlled food challenge.

A peanut desensitisation service is not currently provided by the NHS. However, current NICE guidelines state that some people may need allergen-specific immunotherapy, which should be supervised by allergy specialists and should only be provided by physicians and nurses with specialist knowledge.

INNOVATION and/or ADVANTAGES

If licensed for this indication, AR101 could provide a novel way of treating adults and children with peanut allergy.

Reaching a tolerated dose of peanut protein of 300 mg could be a key milestone in the immunotherapy treatment of highly peanut-sensitive individuals at very high risk of allergic reactions, as this could mean ability to tolerate most trace levels of undeclared peanut protein in food products.

DEVELOPER

Aimmune Therapeutics.
Food allergies occur when the body’s immune system mistakenly treats proteins found in food as a threat. Immunoglobulin E mediated food allergies are most common and involve a greater risk of rapid reactions and anaphylaxis, which is an acute, potentially fatal, allergic reaction that is characterised by rapidly developing airway, breathing and circulation problems.

Peanut allergy is a major cause of food-induced deaths and having the allergy is associated with a reduced quality of life.

Reported prevalence of peanut allergy in children in the UK varies depending on the source; figures ranging from 2 in 1,000 to 19 per 1,000 have been reported. About 20% of children outgrow their peanut allergy.

In England in 2015/16, there were 4,673 hospital admissions due to adverse food reactions (T78.0 and T78.1), resulting in 1,882 bed days and 4,877 finished consultant episodes. Over half of these episodes were in paediatric patients aged between 0 and 14. Annually, about 10 deaths are caused by food allergies in England and Wales.

### CURRENT TREATMENT OPTIONS

There is currently no approved treatment for peanut allergy. Avoidance of the food through a peanut-free diet is the best way of preventing allergic reactions, and auto-injector pens (epinephrine) are used in emergency situations when a severe allergic reaction occurs.\(^6\,^7\) However, avoidance of exposure to trace amounts of peanut protein capable of eliciting an allergic reaction is very difficult due to the nearly ubiquitous presence of peanuts in the food industry, the potential for cross-contamination, and incorrect ingredient information in restaurants and on product labels.

Other forms of immunotherapy have also been explored in an effort to find treatments for peanut allergy. Subcutaneous, sublingual and oral immunotherapy have all been trialled and have induced clinical benefits but with varying levels of adverse reactions.\(^7\,^11\)

### EFFICACY and SAFETY

<table>
<thead>
<tr>
<th>Trial</th>
<th>PALISADE; NCT02635776; AR101 vs placebo; phase III trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponsor</td>
<td>Aimmune Therapeutics Inc.</td>
</tr>
<tr>
<td>Status</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Source of Information</td>
<td>Company website,(^1,^3) trial registry,(^12) Adis Insight(^2)</td>
</tr>
<tr>
<td>Location</td>
<td>Canada, Denmark, Ireland, Netherlands, Spain, Sweden, USA, United Kingdom</td>
</tr>
<tr>
<td>Design</td>
<td>Randomised, double-blind, placebo-controlled</td>
</tr>
<tr>
<td>Participants</td>
<td>Approximately 500 patients aged 4-55, with a clinical history of allergy to peanuts or peanut-containing foods.</td>
</tr>
</tbody>
</table>
Patients undergo a dose escalation period of approximately 22 weeks to reach the maintenance dose of 300 mg per day, then continue with daily maintenance at 300 mg per day for approximately six months. At the end of the maintenance period, patients undergo an exit double-blind, placebo-controlled food challenge.

Peanut allergy de-sensitisation [Time Frame: 12 months]
The proportion of subjects who tolerate at least 1043 mg cumulative of peanut protein with no more than mild symptoms at the exit double blind placebo controlled food challenge.

Not reported

Estimated Primary Completion Date: November 2017 (Final data collection date for primary outcome measure).

The cost of AR101 is not yet known.

Reduced symptoms or disability

Reduced symptoms or disability

No impact identified

Increased use of existing services

Decreased use of existing services

Need for new services
Other: potential requirement for new staff training

None identified

IMPACT ON COSTS and OTHER RESOURCE USE

Increased drug treatment costs

Reduced drug treatment costs

Other increase in costs: provision of a new mode of immunotherapy if provided within the NHS

Other reduction in costs: potential reduction in peanut allergy related hospital attendance if desensitisation is achieved and anaphylaxis avoided

Other

None identified

OTHER ISSUES

Clinical uncertainty or other research question identified:

None identified

REFERENCES


