AstraZeneca

Clinical Study Results

Research Sponsor: AstraZeneca AB

Drug Studied: Benralizumab

Study Title: A study to find out how benralizumab works in participants with asthma

Protocol Number: D3250C00040

Thank you!

Thank you for taking part in the clinical study for the study drug benralizumab.

You and all of the participants helped researchers learn more about benralizumab to help people with asthma.

AstraZeneca AB sponsored this study and believes it is important to share the results of the study with you and the public. An independent non-profit organization called CISCRP helped prepare this summary of the study results for you. We hope it helps you understand and feel proud of your important role in medical research.

If you participated in the study and have questions about the results, please speak with the study doctor or staff at your study site.

Overview of this study

Why was the research needed?

Researchers are trying to find out how benralizumab works in the body. Before a treatment can be approved for participants to take, researchers do clinical studies to find out how it works and how safe it is.

What treatments did the participants take?

The participants in this study got benralizumab or a placebo. A placebo looks like a treatment but does not have any medicine in it.

What were the results of the study?

The main questions the researchers wanted to answer in this study were:

> **Did benralizumab affect the participants' allergic responses in their lungs?**

Yes. Overall, the researchers found that benralizumab did affect some of the participants' allergic responses in their lungs compared with the placebo.

> **Did benralizumab affect the amount of air the participants could breathe out after an allergic trigger?**

No. Overall, the researchers found that there were some small changes in the amount of air the participants could breathe out in both groups of participants. But, these changes were too small for the researchers to know if benralizumab affected the participants' breathing compared with the placebo.

> **What medical problems did the participants have during the study?**

There were 8.7% of participants who had medical problems that the study doctors thought might be related to the study drug during the study. The most common medical problem was migraine. More details about the results of this study are included later in this summary.

Where can I learn more about this study?

You can find more information about this study on the websites listed on the last page. When a full report of the study results is available, it can also be found on those websites.

Who took part in the study?

The researchers asked for the help of men and women with mild allergic asthma, also called allergen-induced asthma. The participants in this study were 19 to 64 years old when they joined. The participants all had asthma symptoms due to environmental allergies. These are allergies caused by triggers that are inhaled, such as plant pollens and pet dandruff or fur.

The study included 46 participants in Canada.

Why was the research needed?

Researchers are trying to find out how benralizumab works in the body. Before a treatment can be approved for people to take for different medical problems, researchers do clinical studies to find out how it works and how safe it is.

In this study, the researchers wanted to find out if benralizumab works in a number of participants with allergic asthma. They also wanted to find out if the participants had any medical problems during the study.

Allergic asthma is triggered by having an allergic reaction in the lungs. The specific trigger that an individual person is allergic to is called an allergen.

Allergic asthma happens when the allergen gets in the lungs and the cells in the immune system try to attack it which leads to inflammation. One of these types of cells involved in inflammation is called an eosinophil. People with allergic asthma may have too many eosinophils in their lungs, which can lead to inflammation and tightening of the airways during an asthma attack. The eosinophils can also cause the lung mucus to increase and become thick and heavy. The inflammation, tightened airways, and mucus all make it hard to breathe and result in asthma symptoms.

Researchers think that getting benralizumab regularly can help get rid of the extra eosinophils and other immune cells. This could help control asthma symptoms.

In this study, the researchers wanted to find out if benralizumab affected the allergic response in the participants' lungs and if it affected their breathing.

What was the purpose of this study?

The main questions the researchers wanted to answer in this study were:

- Did benralizumab affect the participants' allergic responses in their lungs?
- Did benralizumab affect the amount of air the participants could breathe out after an allergic trigger?
- What medical problems did the participants have during the study?

The answers to these questions are important to understand how benralizumab helps improve the health of people with asthma.

What treatments did the participants take?

In this study, the participants got either benralizumab or a placebo. A placebo looks like a drug but does not have any medicine in it. Researchers use a placebo to help make sure any of the effects they see in the participants who get the drug are actually caused by the drug.

This was a "double-blind" study. This means none of the participants, researchers, study doctors, or other study staff knew what treatment each participant was getting. Some studies are done this way because knowing what treatment the participants are getting can affect the results of the study. When the study ended, the research sponsor found out which treatment the participants got so they could create a report of the study results.

A computer program was used to randomly choose the treatment each participant got. This helps make sure the groups are chosen fairly. Researchers do this so that comparing the results of each treatment is as accurate as possible.

The participants got benralizumab or the placebo as an injection into the skin. They got 1 dose every 4 weeks for a total of 3 doses. The dose of benralizumab was 30 milligrams, also known as mg.

In this study:

- 23 participants got benralizumab
- 23 participants got the placebo

What happened during the study?

Each participant was in the study for about 6 months. But, the entire study took 3 years to finish.

The study started in October 2016 and ended in October 2019.

At different points throughout the study, the study doctors measured the participants' allergic responses by triggering a controlled allergic reaction. This is known as an "allergen challenge". This is done in a safe environment with doctors around in case there are any medical problems.

The chart below shows what happened during the study.

Before the participants took study treatment

6 visits

The study doctors:

- checked the health of the participants to make sure they could join the study
- did a physical exam and asked about the participants' medications and any medical problems
- checked the participants' heart health using an electrocardiogram, also called an ECG
- checked the participants' lung health and measured the amount of air they could breathe out
- took blood, urine, and mucus samples
- triggered an allergen challenge in the participants
- looked in the participants' lungs using a small camera, also called a bronchoscopy, for some participants
- took bone marrow samples through a needle into the hip bone, for some participants

Up to 6 weeks

While the participants took study treatment

10 visits

The study doctors:

- did a physical exam and asked about the participants' medications and any medical problems
- checked the participants' lung health and measured the amount of air they could breathe out
- gave the participants an injection of benralizumab or the placebo once every 4 weeks
- took blood, urine, and mucus samples
- triggered an allergen challenge 2 more times
- did a bronchoscopy at some visits for some participants
- took bone marrow samples at some visits for some participants

12 weeks

After the participants took study treatment

2 visits

The study doctors:

- did a physical exam and asked about the participants' medications and any medical problems
- checked the participants' lung health and measured the amount of air they could breathe out
- took blood and urine samples
- did an ECG

Up to 8 weeks

What were the results of the study?

This is a summary of the main results from this study overall. The results each participant had might be different and are not in this summary. A full list of the questions researchers wanted to answer can be found on the websites listed at the end of this summary. When a full report of the study results is available, it can also be found on these websites.

Researchers look at the results of many studies to decide which treatments work best and are safest. Other studies may provide new information or different results. Always talk to a doctor before making any treatment changes.

There was 1 participant who did not finish getting all of their measurements or doses of study treatment. So, the results below are for 45 out of 46 participants.

Did benralizumab affect the participants' allergic responses in their lungs?

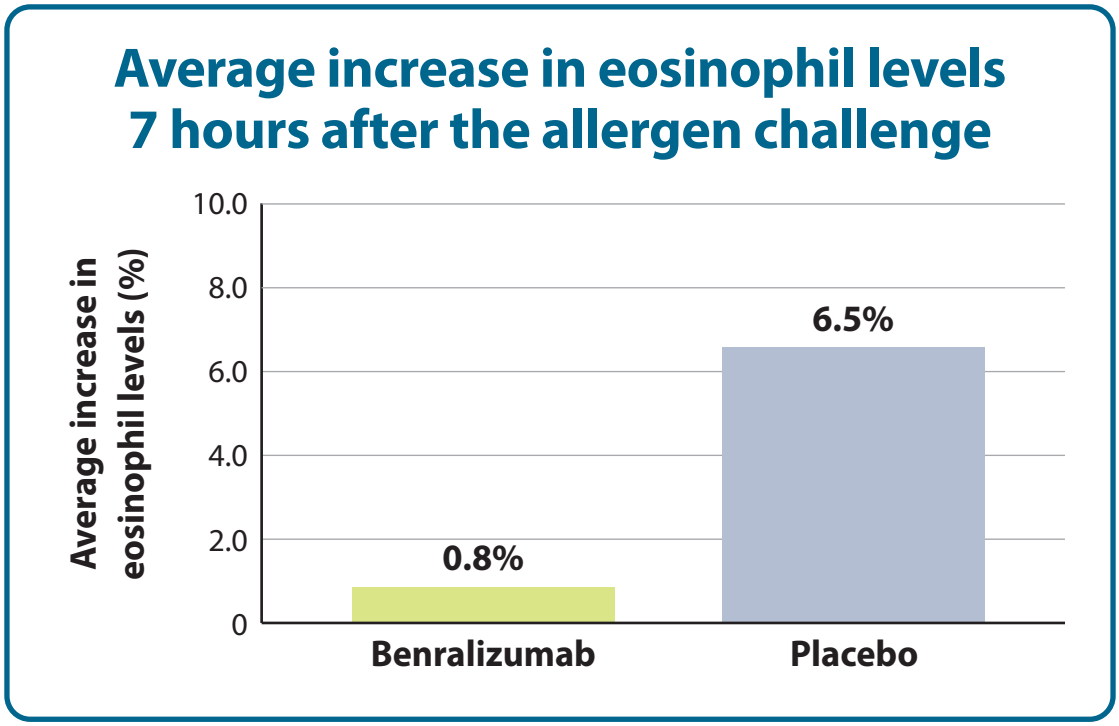
Yes. Overall, the researchers found that benralizumab did affect the participants' allergic responses in their lungs compared with the placebo.

To answer this question, the researchers measured the participants' allergic responses by triggering a controlled allergic reaction. This is known as an allergen challenge. This is done in a safe environment with doctors around in case there are any medical problems.

The participants did an allergen challenge after taking study treatment for 8 weeks. The researchers measured the average number of eosinophil cells in the participants' lung mucus. They did this before this allergen challenge and 7 hours after this allergen challenge. The researchers measured the change in eosinophils as a percentage.

The researchers found that 7 hours after the allergen challenge, the participants' eosinophil levels increased by an average of:

- 0.8% for the participants who got benralizumab
- 6.5% for the participants who got the placebo



Did benralizumab affect the amount of air the participants could breathe out after an allergic trigger?

No. Overall, the researchers found that there were some small changes in the amount of air the participants could breathe out in both groups of participants. But, these differences were too small for the researchers to know if benralizumab affected the participants' breathing compared with the placebo.

To answer this question, the researchers measured the average amount of air the participants could breathe out in 1 second.

The researchers measured this during the allergen challenge that was done after 8 weeks of taking study treatment. The researchers did this before the allergen challenge and throughout the 7 hours after the allergen challenge. They calculated the change in the breathing measurements as percentages.

The researchers found that 7 hours after the allergen challenge, the amount of air the participants could breathe out in 1 second decreased by an average of:

- 15.2% for the participants who got benralizumab
- 16.3% for the participants who got the placebo

What medical problems happened during the study?

This section is a summary of the medical problems the participants had during the study that the study doctors thought might be related to the study drug. These medical problems are called "adverse reactions". An adverse reaction is considered "serious" when it is life-threatening, causes lasting problems, or requires hospital care.

These adverse reactions may or may not be caused by the study drug. A lot of research is needed to know whether a drug causes an adverse reaction. These adverse reactions have been, and will continue to be, reviewed together with all of the available data for the study drug.

The websites listed at the end of this summary may have other information about adverse reactions or other medical problems that happened during this study.

Did any adverse reactions happen during this study?

There were 8.7% of participants who had adverse reactions during the study. This was 4 out of 46 participants.

4.3% of participants who got benralizumab had adverse reactions during the study. This was 1 out of 23 participants.

13.0% of participants who got the placebo had adverse reactions during the study. This was 3 out 23 participants.

None of the participants had serious adverse reactions.

None of the participants stopped taking study treatment due to adverse reactions.

What adverse reactions happened during this study?

The most common adverse reaction was a migraine.

The table below shows the adverse reactions that happened during the study. Some participants may have had more than 1 adverse reaction.

Adverse reactions during this study

Adverse reaction	Benralizumab (out of 23 participants)	Placebo (out of 23 participants)
Migraine	4.3% (1)	4.3% (1)
Flushing	4.3% (1)	0.0% (0)
Injection site pain	4.3% (1)	0.0% (0)
Itchiness	0.0% (0)	4.3% (1)
Muscle pain	0.0% (0)	4.3% (1)

How has this study helped patients and researchers?

This study helped researchers learn more about how benralizumab works in the body of participants with asthma.

Researchers look at the results of many studies to decide which treatments work best and are safest. This summary shows only the main results from this one study. Other studies may provide new information or different results.

Further clinical studies to understand how benralizumab works in people with asthma are ongoing.

Where can I learn more about this study?

You can find more information about this study on the websites listed below. If more information about the study results is available, it can also be found here.

- www.clinicaltrials.gov. Once you are on the website, type **"NCT02821416"** into the search box and click **"Search"**.
- www.AstraZenecaClinicalTrials.com. Once you are on the website, type **"D3250C00040"** into the search box, and click **"Find a Study"**.

Full Study Title: A Double-Blind, Randomized, Parallel Group, Placebo-Controlled Multi-Centre Study to Evaluate the Effect of Benralizumab on Allergen-Induced Inflammation in Mild, Atopic Asthmatics

AstraZeneca AB Protocol Number: D3250C00040

National Clinical Trials number: NCT02821416

AstraZeneca AB sponsored this study and has its headquarters in Södertälje, Sweden.

The phone number for the AstraZeneca Information Center is +1-877-240-9479.

Thank you!

Clinical study participants belong to a large community of people who take part in clinical research around the world. They help researchers answer important health questions and find medical treatments for patients.

CISCRP

The Center for Information & Study on Clinical Research Participation (CISCRP) is a non-profit organization focused on educating and informing the public about clinical research participation. CISCRP is not involved in recruiting participants for clinical studies, nor is it involved in conducting clinical studies.

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