Clinical Study Results

Pearl™
A member of the AstraZeneca Group

Research Sponsor: Pearl Therapeutics, Inc.

Drugs studied: Budesonide, Glycopyrronium, and Formoterol Fumarate

Study Title: A study to learn how budesonide, glycopyrronium, and formoterol fumarate taken together in different ways act in the body

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Thank you!

Thank you to the participants who took part in the clinical trial for the study drugs budesonide, glycopyrronium, and formoterol fumarate.

Pearl Therapeutics, Inc. sponsored this study and thinks it is important to share the results. An independent, non-profit organization called CISCRP helped prepare this summary of the study results for you.

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

What is happening with the study now?

The participants were in the study for about 13 weeks.

The study started in October 2017 and ended in December 2017.

The sponsor reviewed the data collected when the study ended and created a report of the results. This is a summary of that report.

Why was the research needed?

Researchers are looking for a better way to treat chronic obstructive pulmonary disease, also known as COPD. Before a treatment can be approved for patients to take, researchers do clinical studies to find out how safe it is and how it works.

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

- How did the 3 drugs taken together in different ways act in the body?
- What medical problems did the participants have during the study?

The answers to these questions are important to know before other studies can be done that help find out if the 3 drugs taken together in different ways can help improve the health of people with COPD.

COPD is a disease that can cause swelling in the lungs, which can make it difficult to breathe. Budesonide, glycopyrronium, and formoterol fumarate are approved drugs that are taken in an inhaler to treat COPD. In this study, researchers wanted to learn if these drugs would act differently in the body depending on how people took them.

What kind of study was this?

This was an “open-label” study. This means the researchers and the participants knew what the participants were taking.

There were 4 treatments in this study. All of the participants took all 4 of the treatments, but in a different order. The treatments in this study were taken through an inhaler.

The participants in this study took some of their inhaler treatments with a “spacer”. Spacers are tubes or masks that are attached to the mouthpiece of inhalers. When a person uses an inhaler with a spacer, the drug is held inside of the spacer. This makes it easier to breathe in more of the drug so it ends up in the lungs.

The participants in this study also took some of their inhaler treatments with charcoal in liquid form through the mouth before and after using the inhaler. Charcoal stops the study drug from getting into the stomach. Using charcoal in this study helped the researchers measure the amount of the study drugs that reached the lungs only.

A computer program was used to randomly choose the treatment each participant took. 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.

What happened during the study?

Before the study started, the doctors:

- did a physical examination
- checked the heart health of the participants using an electrocardiogram, also known as an ECG
- took blood and urine samples
- asked about the medical history of the participants, how they were feeling, and what medicines they were taking

During the study, the participants visited their study site 4 more times. They took 1 of the 4 inhaler treatments during each visit until they had taken all 4 treatments.

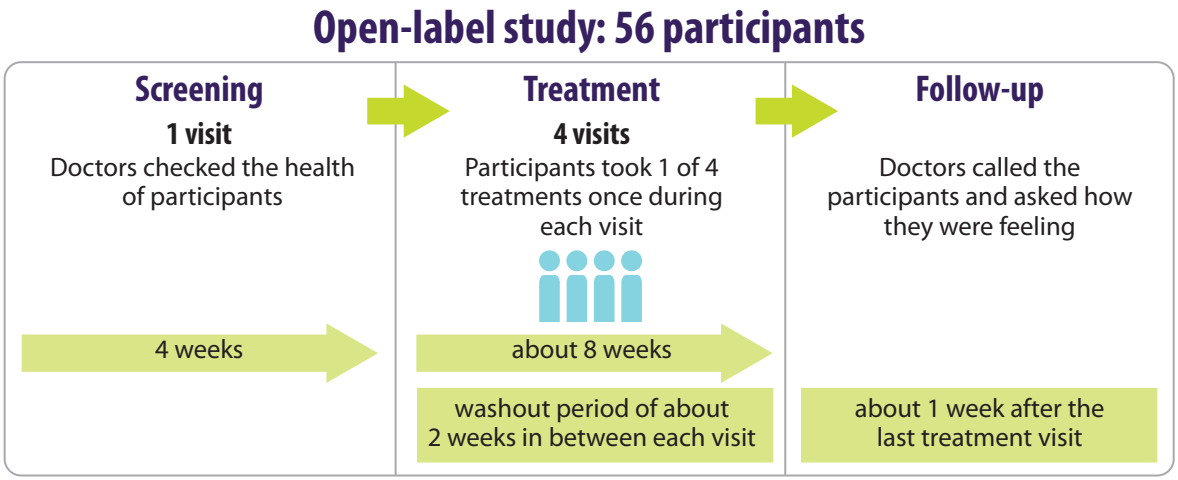
There was a “washout period” of about 2 weeks in between these visits. During this time, the participants were not allowed to take certain medicines. This means that their bodies had processed all of the medicines in their blood, and the medicines had “washed out” of their bodies.

The participants took the same dose of budesonide, glycopyrronium, and formoterol fumarate each time, but in a different order. They also took each treatment in a different order in an inhaler in these 4 ways:

- without charcoal, but with a spacer
- without charcoal or a spacer
- with both charcoal and a spacer
- with charcoal, but without a spacer

At the end of the study, the doctors called the participants about 1 week after their last treatment dose and asked how they were feeling and what medicines they were taking.

The figure below shows how the study was done.



What were the results of the study?

This is a summary of the main results from this study overall. The results each individual participant had might be different and are not in this summary. 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 change.

The websites listed at the end of this summary may have a full report of the study results.

How did the 3 drugs taken together in different ways act in the body?

In general, the researchers found that a higher overall and average amount of the 3 drugs reached the body when the participants took the treatments that included spacers compared to when they took the treatments without spacers.

To answer this question, the researchers measured:

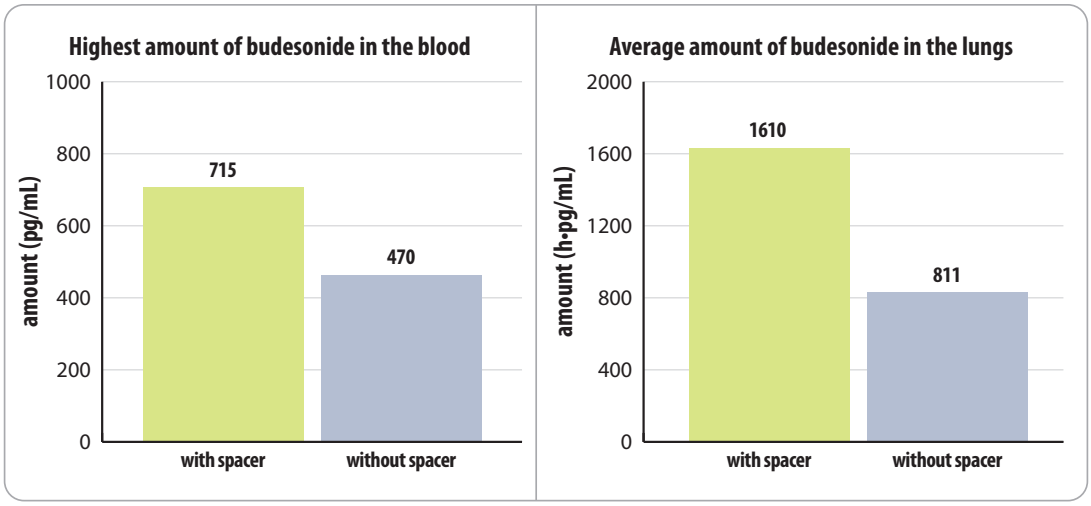
- the highest amount of the 3 drugs in the blood at any time during the study
- the average amount of the 3 drugs in the lungs over 2 days

The researchers measured the highest amount of the drugs in the blood using picograms per milliliter, also known as pg/mL. They measured the average amount of the drugs in the lungs using picogram hours per milliliter, also known as h•pg/mL.

In general, the researchers found that budesonide:

- reached a highest amount in the blood of 715 pg/mL when taken with a spacer
- reached a highest amount in the blood of 470 pg/mL when taken without a spacer
- reached an average amount in the lungs of 1610 h•pg/mL when taken with a spacer
- reached an average amount in the lungs of 811 h•pg/mL when taken without a spacer

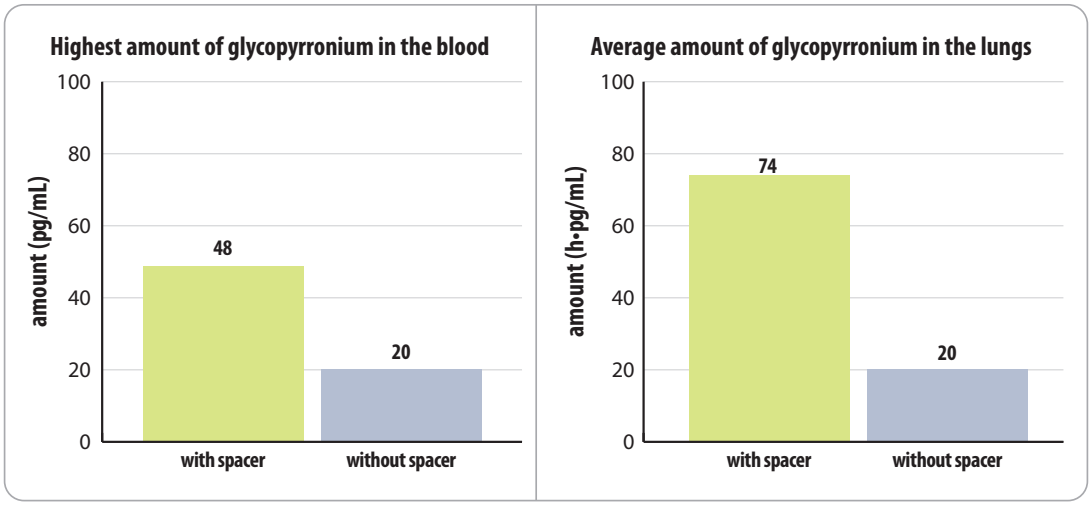
The figures below show these results.



In general, the researchers found that glycopyrronium:

- reached a highest amount in the blood of 48 pg/mL when taken with a spacer
- reached a highest amount in the blood of 20 pg/mL when taken without a spacer
- reached an average amount in the lungs of 74 h•pg/mL when taken with a spacer
- reached an average amount in the lungs of 20 h•pg/mL when taken without a spacer

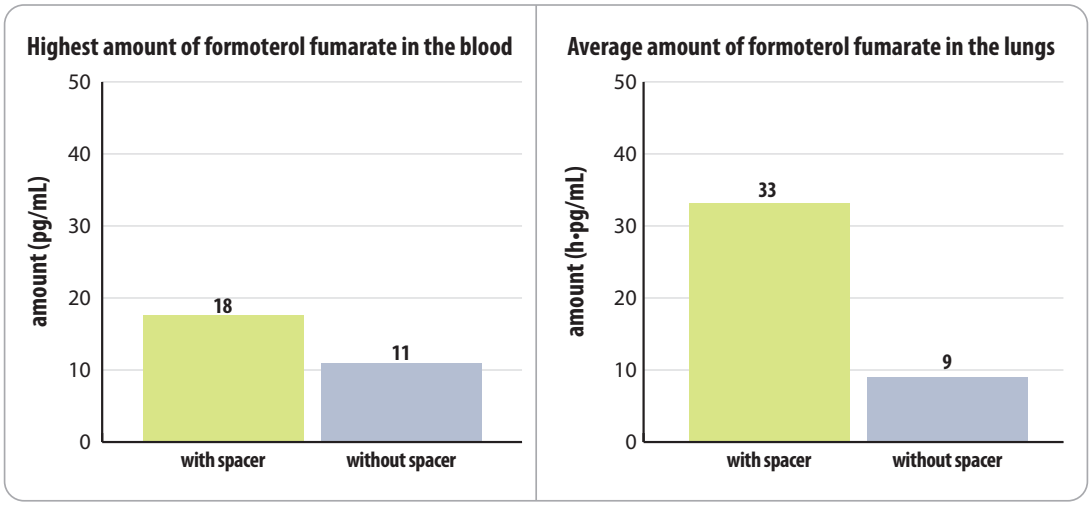
The figures below show these results.



In general, the researchers found that formoterol fumarate:

- reached a highest amount in the blood of 18 pg/mL when taken with a spacer
- reached a highest amount in the blood of 11 pg/mL when taken without a spacer
- reached an average amount in the lungs of 33 h•pg/mL when taken with a spacer
- reached an average amount in the lungs of 9 h•pg/mL when taken without a spacer

The figures below show these results.



What medical problems did the participants have during the study?

This section is a summary of the medical problems that participants had during the study that the study doctors thought might be related to the study drugs. 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 drugs. A lot of research is needed to know whether a drug actually causes an adverse reaction.

The adverse reactions that happened in this study are not in this summary. Because there was a very small number of participants, leaving this information out helps protect their identities. The websites listed at the end of this summary may have other information about medical problems that happened in this study.

How has this study helped patients and researchers?

This study helped researchers learn how budesonide, glycopyrronium, and formoterol fumarate act in the body when taken together in different ways.

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 with budesonide, glycopyrronium, and formoterol fumarate are planned.

Where can I learn more about this study?

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

- www.clinicaltrials.gov. Once you are on the website, type **"NCT03311373"** into the search box and click **"Search"**.
- www.AstraZenecaClinicalTrials.com. Once you are on the website, type **"PT010011"** into the search box, and click **"Find a Study"**.

Full study title: A Randomized, Open-Label, Single-Dose, Single-Center, Crossover Study in Healthy Subjects to Assess the Relative Bioavailability of PT010 Administered With and Without a Spacer, and With and Without Oral Charcoal

Protocol number: PT010011

Pearl Therapeutics, Inc., a member of the AstraZeneca Group, sponsored this study and has its headquarters at 280 Headquarters Plaza, Morristown, NJ 07960.

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 participants.

CISCRP
THE CENTER FOR INFORMATION & STUDY ON CLINICAL RESEARCH PARTICIPATION

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 patients for clinical studies, nor is it involved in conducting clinical studies.

CISCRP
One Liberty Square, Suite 510
Boston, MA 02109

1-877-MED-HERO • www.ciscrp.org