Clinical Study Results

Research Sponsor:	Biogen
Drug Studied:	Dimethyl fumarate (BG00012, Tecfidera®)
ClinicalTrials.gov Identifier:	NCT02555215
EudraCT Number:	2015-003282-29
Protocol Number:	109MS311
Study Dates:	February 2016 to September 2018
Short Study Title:	A study to learn about the long-term safety of dimethyl fumarate in children and adolescents with relapsing forms of multiple sclerosis

Thank you!

A clinical study participant belongs to a large community of clinical research participants around the world.

By taking part in a study, the participants help researchers answer important health questions and evaluate new potential medical treatments.

This clinical study helped researchers learn about the long-term safety of the study drug, dimethyl fumarate, in adolescents with relapsing forms of multiple sclerosis. Dimethyl fumarate is also known as BG00012 and Tecfidera®. Dimethyl fumarate is called DMF in this summary.

Biogen, the sponsor of this study, is grateful to those who took part. We believe it is important to share the overall results of the study. If you have questions, please speak with the doctor or staff at your study research center.

Why was the research needed?

Researchers are looking for a better way to treat children and adolescents with multiple sclerosis, also known as MS. This disease happens when a person's immune system attacks a fatty layer of cells that helps cover and protect nerves in the body. When the layer is damaged, signals between the brain and the rest of the body are slowed down or blocked. People with MS may have problems with vision, thinking and memory skills, muscle movements, and coordination.

In this study, the patients were children or adolescents with relapsing forms of MS. In this kind of MS, old symptoms can return or new symptoms can form after the disease seemed to be gone for some time.

While there are some treatment options for adults with relapsing forms of MS, there is only 1 approved treatment option for children and adolescents with relapsing forms of MS.

The study drug, DMF, can be used to treat adults with relapsing forms of MS. The patients in this study finished the first study testing DMF treatment in children and adolescents with relapsing forms of MS. In this study, the researchers wanted to know about the long-term safety of DMF in these patients who continued taking DMF.

The main question the researchers wanted to answer was:

- What adverse events did the patients have? Adverse events are medical problems that may or may not be caused by the study drug.

What happened during the study?

This study took over 2 years to complete. It included 20 patients at 12 research centers in Belgium, Bulgaria, the Czech Republic, Germany, Kuwait, Latvia, Lebanon, Poland, Turkey, and the United States. The patients in this study were children and adolescents with relapsing forms of MS. These patients had finished an earlier study with DMF treatment. At the start of this study, the age range of the patients was 14 years to 18 years.

When the study ended, the sponsor reviewed the data and created a report of the results. This is a summary of that report.

This study was **"open-label"**. This means that the patients, the study doctors, other study staff, and the researchers knew that each patient was taking DMF. In this study, all the patients took DMF pills by mouth. Doses were measured in milligrams, also called mg.

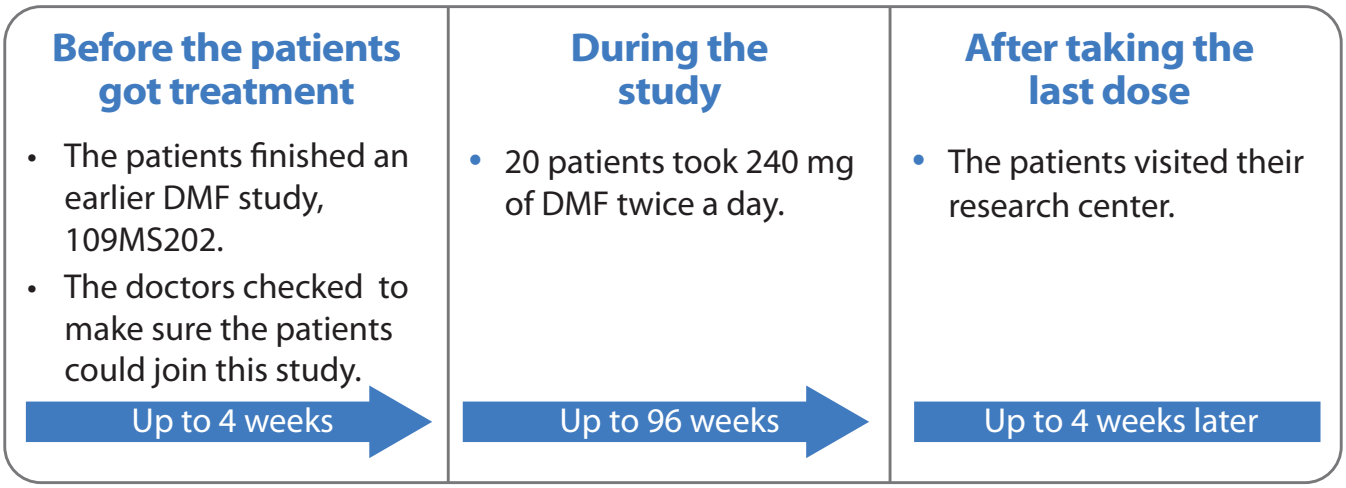
Before the patients got treatment, they visited their research center. At this visit, the doctors examined each patient to make sure they could join the study. This visit was either the same as the last visit for the earlier DMF study, or within 4 weeks of starting this study.

During the study, 20 patients took 240 mg of DMF twice a day by mouth. The patients took DMF for up to 96 weeks.

Throughout the study, the doctors asked each patient how they were feeling and what medicines they were taking.

After taking the last dose, the patients visited their research center 4 weeks later for a follow-up.

The figure below shows how the study was done.



What were the study results?

The information below tells you what the researchers learned while trying to answer their main questions. Below is an overall summary of the results and the key questions the researchers asked during the study.

What adverse events did the patients have?

A lot of research is needed to know whether a drug causes a medical problem, also called an adverse event. An adverse event is considered "serious" when it results in death, is life-threatening, causes lasting problems, or requires hospital care. Learning about any adverse events during long-term treatment was the main goal of this study. When drugs are being studied, researchers keep track of all adverse events that patients have. This includes during the study and after it ends. Not everyone experiences them, and they may or may not be caused by the study drug.

In this study, the researchers learned more about the long-term safety of DMF in children and adolescents. The adverse events in patients in this study were similar to the adverse events in the previous DMF study.

How many patients had adverse events in this study?

During this study, most of the patients had adverse events. Some of the patients had serious adverse events. None of the patients left the study because of adverse events.

The table below shows how many patients had adverse events during this study.

Adverse events during this study

	DMF Out of 20 patients (%)
How many patients had adverse events?	18 (90%)
How many patients had serious adverse events?	2 (10%)
How many patients left the study because of adverse events?	0 (0%)

What serious adverse events did the patients have?

During this study, there were 2 patients who had serious adverse events. These serious adverse events were:

- relapse of MS
- stomach pain

None of the patients died due to adverse events during this study.

What were the most common adverse events?

During this study, the most common adverse event was flushing, a condition where the skin turns red. This happened in 25% of the patients in this study. This was 5 out of 20 patients.

The table below shows the adverse events that happened in at least 15% of the patients during this study. There were other adverse events, but they happened in fewer patients.

Most common adverse events during this study

	DMF Out of 20 patients (%)
Flushing (a condition where the skin turns red)	5 (25%)
Relapse of MS	4 (20%)
Cough	3 (15%)
Headache	3 (15%)
Infection of the upper airways	3 (15%)
Period cramps	3 (15%)
Stomach pain	3 (15%)
Viral infection of the upper airways	3 (15%)

Where can I learn more about the study?

You can find more information about the study online at www.clinicaltrials.gov. Once on the site, type **"NCT02555215"** into the search box and click **"Search".**

You can also find more information online at www.clinicaltrialsregister.eu. Once on the site, click **"Home and Search"** then type **"2015-003282-29"** in the search box and click "Search".

If you have questions about DMF or the results of this study, please speak with the doctor or staff at your study research center.

Official study title: A Multicenter Extension Study to Determine the Long-Term Safety and Efficacy of BG00012 in Pediatric Subjects With Relapsing-Remitting Multiple Sclerosis

Biogen, the sponsor of this study, has its headquarters in Cambridge, Massachusetts (USA).

The results presented here are from a single study. Do not make changes to your therapy based on these results without first consulting a doctor. Further studies with DMF in children or adolescents with relapsing forms of MS are ongoing.

Thank you!

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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 helped prepare this summary of the study results. CISCRP is not involved in recruiting participants for clinical trials, nor is it involved in conducting clinical trials.

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