

## Aimovig newly developed drug and its treatment for migraine

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### ABSTRACT

Neurological diseases are not paid as much as attention as the other diseases. These diseases hold as much importance as any other kind. One such disease is migraine, which is neglected to be taken care of as most of the people think it just a headache. In reality headache and migraine are two different terms and are very differently cured. Migraine is usually caused by an aura at a specific region of your brain. Current diagnosis is unable to treat migraine. The recent development by Novartis and Amgen had made possible to treat migraine and this drug is called Aimovig. Aimovig is a neuropeptide and specifically react against the migraine stimulating receptor known as Calcitonin gene-related peptide. This new drug verified by the FDA is a very useful medication for this particular type of diseases and not many types of drugs are available to treat migraine.

**Keywords:** Aimovig, CGRP, headache, migraine, neuropeptide.

### I. Introduction

#### 1.1 Headache vs. Migraine

Healthy is a state of a person's physical as well as mental well being. A person's mental well being is equally as important as one's physical well being. One such neurological disease is Migraine.

Often, people get confused headache with migraine. Headache is considered a common form of pain caused by stress and anxiety whereas migraine is not just any headache but a severe form of it. Unlike headache which is pain in apart of head, migraine is a neurological disease. Migraine is condition of throbbing in a specific part of brain resulting in multiple symptoms like nausea, vomiting, palpitations and most importantly sensitive to light and sound.

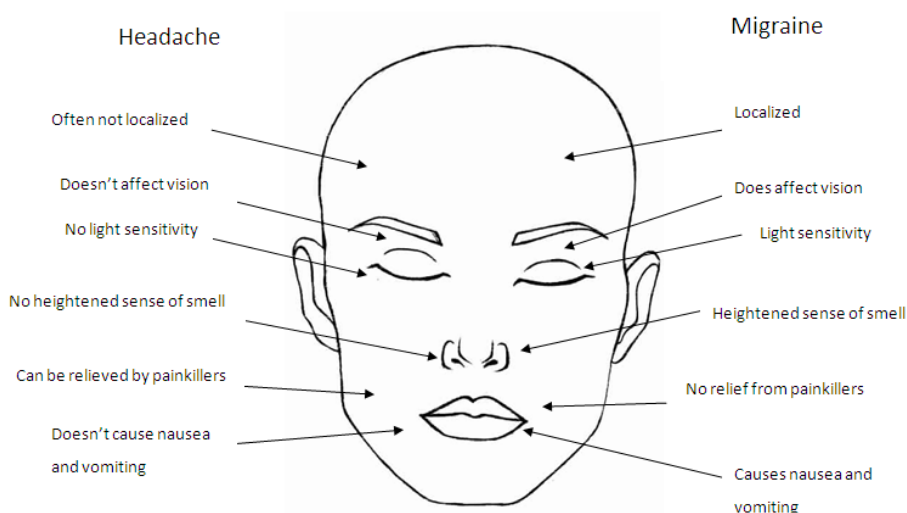


Fig 2: differences between headache and migraine

#### 1.2 Two major categories include:

##### 1.2.1 Migraine with Aura:

It is also known as complicated migraine. Aura is associated with sensory disturbances including vision, hearing and sensing. Aura more often is a indication of migraine attack beforehand. This disorder includes unable to speak clearly, hallucination, loss of sight, sensation of tingling in the body etc. these aura happens before the migraine attack and last for around 20 minutes.

**1.2.2 Migraine without Aura:**

Migraine aura also known as the common migraine, doesn't experience the aura sensations like the signals of visuals and sensory like that of migraine with aura. Symptoms are more or less same as that of migraine with aura for example vomiting, pain on a specific side of the brain, photophobia and phonophobia.

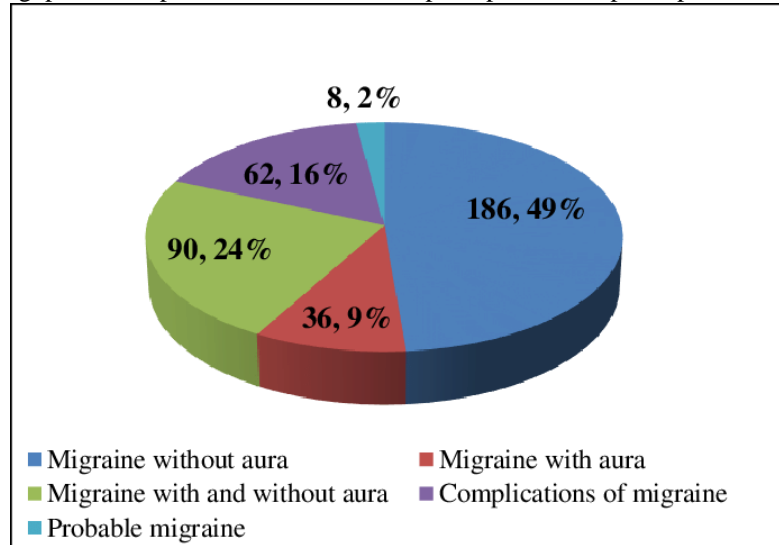


Fig 2: Division of major types of migraine.



Fig 3: Migraine is the one of the leading disease.

**1.3 Migraine trigger factors:**

<b>1.Stress</b>	Emotion	Altered sleep pattern	fatigue	Light glare
<b>2.Physical Exertion</b>	alcohol	smoking	Excessive caffeine	tobacco
<b>3.Odours</b>	perfumes	Exhaust fumes	Paint	solvents
<b>4.Food</b>	MSG	nitrates	Aspartame	Tyramine
<b>5.Drugs</b>	Estrogen	Excessive analgesic use	cocaine	cimetidine

## 1.4 Theories of migraine

### 1.4.1 Vascular theory

Graham and Wolff in 1938 gave the theory of Vascular which is based on the motor and sensory instability in migraine with aura. It views the theory in two stages.

The first stage known as the prodromal phase also recognized as the premonitory phase (PS) is the reason for focal cerebral ischemia and momentary neurologic symptoms. These symptoms are characterized by vasospasm. Second stage is the result from dilation of extra cranial and intracranial vasculature. Prodromal phase is considered as a warning signal for the migraine attack in future. According to vascular theory in an aura, vasoconstriction occurs and thereafter dilation of vasculature leads to migraines.

### 1.4.2 Neuronal theory

This theory is not widely accepted as not much research has been done to explain it. This replaced the vascular theory. This theory says migraine with aura is not the based on sensory and motor instability but rather is based on paroxysmal depolarization of neuron in cortex.

### 1.4.3 Trigemino-vascular theory

Trigemino-vascular theory model is the widely accepted model .It says that depolarization of the cortical neurons followed by reduction in the blood flow of posterior cerebral. Patient's aura is the cause of cortical depression in the occipital region.

## 1.5 Calcitonin gene –related peptide (CGRP) targeted therapy

CGPR are a class of neuropeptide that are now used to treat migraine related neurological diseases. CGRP plays a huge role in the pathophysiology of migraine hence by blocking the pathway of CGRP, migraine can be prevented. Aimovig, newly developed drug and FDA approved in the year 2018 is used to block the receptor of CGRP further preventing migraine attacks.

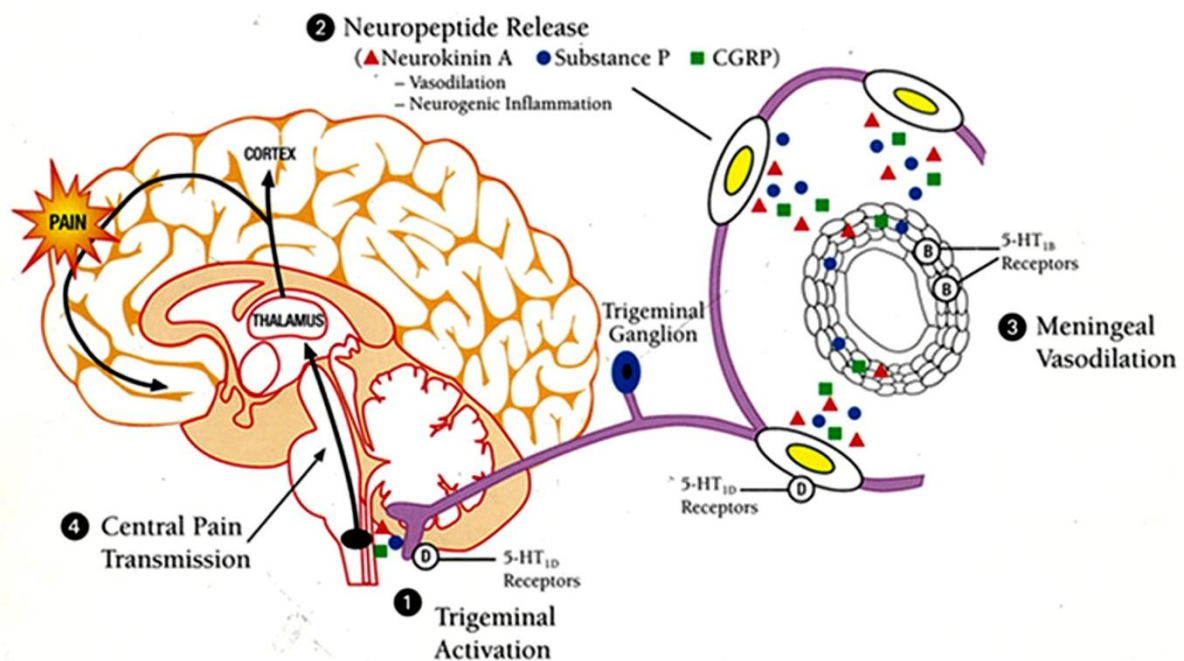


Fig 4: pathophysiology of CGRP

It is a monoclonal antibody of human immunoglobulin G2 having a good affinity for binding to CGRP receptor. It is produced through ovaries of Chinese hamster (CHO) cells by using recombinant DNA technology techniques. CGRP molecules of small chain of peptides are present in many organs particularly the brain. These molecules are the reason for the blood vessels to expand and cause inflammation thereby.

## 1.6 Aimovig

Aimovig (erenumab) was approved by the U.S. Food and Drug Administration (FDA) on May 17, 2018. This drug has been manufactured by Novartis and Amgen Pharmaceuticals jointly. Many of the migraine medicines

work against CGRP protein but Aimovig works against CGRP receptor. Working against the receptor is more beneficial than against the protein for the migraine to occur.

### **1.7 Dosage**

Aimovig should be only given or prescribed by the Doctor. It's given through self injection once a month with an auto injector. The initial dosage accounts for 70mg per month and can range up to 140mg per month.

## **II Conclusion**

Migraine is a type of disease which is often mistaken to be considered as headache and hence is left untreated mostly. This neurological disease has now become a one of the leading cause of death. Earlier there was no such specific treatment for migraine but with drug development advancement, Amgen and Novartis has co-developed a drug for curing this migraine related symptoms named as Aimovig. Aimovig holds a very important place in the future for treating migraine. This drug was verified by the FDA in May 2018.

## **II Acknowledgment**

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