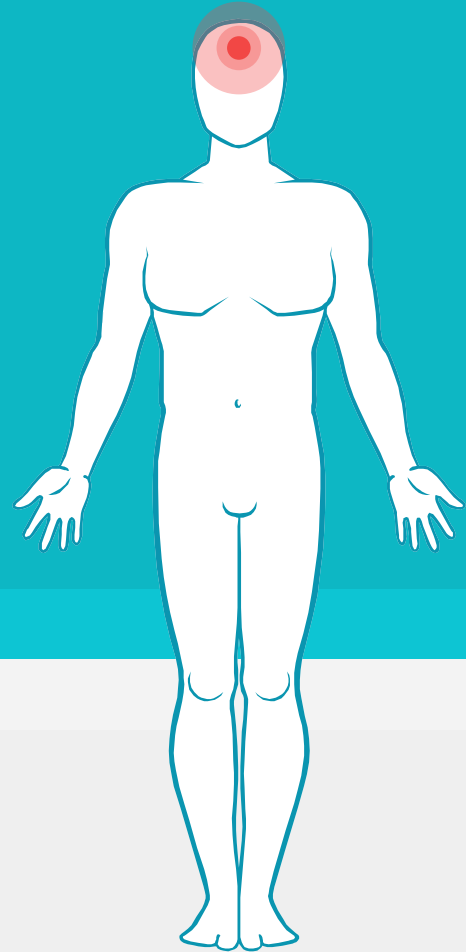


MIGRAINES



RESEARCH PRESENTATION ONE



**GROUP 4 | Miguel Cardoso, Shara Chowdhury,
Sabrina Musto, Harpreet Pabla, Ojan Yarkhani**

LIFESCI 4M03 | Research Seminar
Instructor | Dr. Daniel Yang

1

EPIDEMIOLOGY



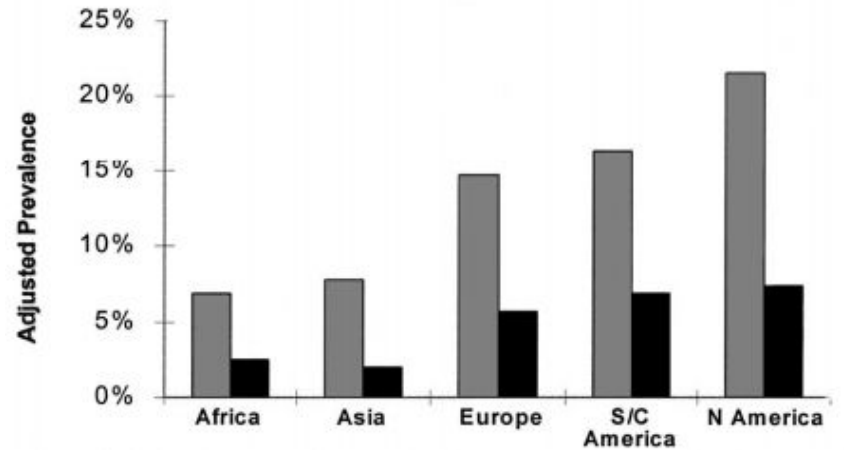
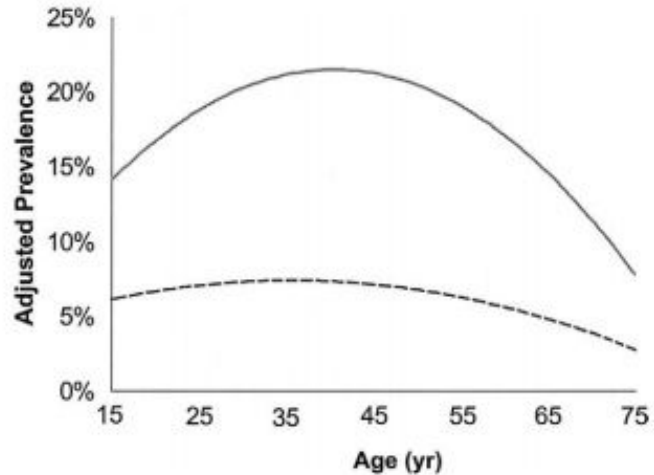
The incidence, distribution, and possible control of a certain disease or illness



WHAT IS A MIGRAINE?

HEADACHES	VS	MIGRAINES
Pain, ache or pressure within the head		Recurring intense headaches
Usually mild or dull in severity		Severity is moderate to severe
Pain not localized		Pain localized to one side of the head
Usually have no additional symptoms		Other symptoms → blind spots light in your vision (aura), dizziness, and nausea

EPIDEMIOLOGY



2

ETIOLOGY



The cause(s) or manner of causation for a disease, illness or condition

1 STRESS & MOOD

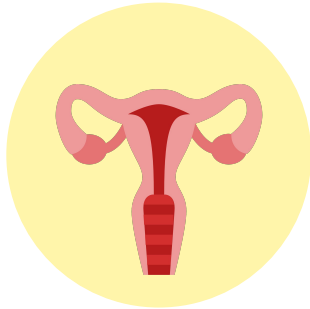
- **Most common self-reported factor, 62%** (Robbins, 1994)
- **Correlated Psychological Factors** (Hashizume et al., 2008)
 - Stress and mood changes examined over time
 - Psychosocial stress precedes migraine onset by 1-3 days
 - Migraine predictability suggested
- **Temporal Relationship** (Holm et al., 1997)
 - Daily temporal relationships between stress, cognitive appraisal, coping, and migraines
 - Stress and migraine are reciprocally related



- **Diet triggers serotonin and norepinephrine release** (Millichap & Yee, 2003)
 - Causes vasoconstriction/vasodilatation
 - Stimulation of trigeminal ganglia, brainstem, cortical neuronal pathways
- **Chocolate** (Gibb et al., 1991)
 - Patients given chocolate or placebo
 - Migraine induced in 5/12 patients given chocolate
 - Migraine induced in 0/8 patients given placebo
- **Red Wine** (Littlewood et al., 1988)
 - Patients given red wine, vodka, or diluted alcohol
 - Red wine provoked a migraine in 9/11 patients
 - Vodka provoked a migraine in 0/8 patients



3 OTHER FACTORS



Menstruation

(Lay & Mascellino, 2001)



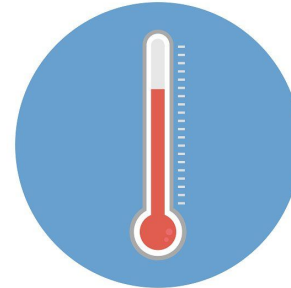
Hunger

(Robbins, 1994)



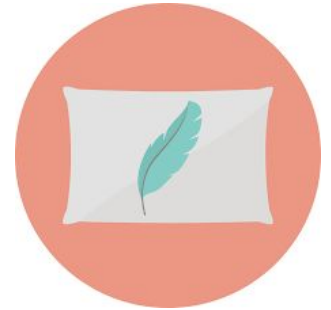
Bright Light

(Robbins, 1994)



Change in Weather

(Hoffman et al., 2011)



Lack of Sleep

(Spierings et al., 2001)

3

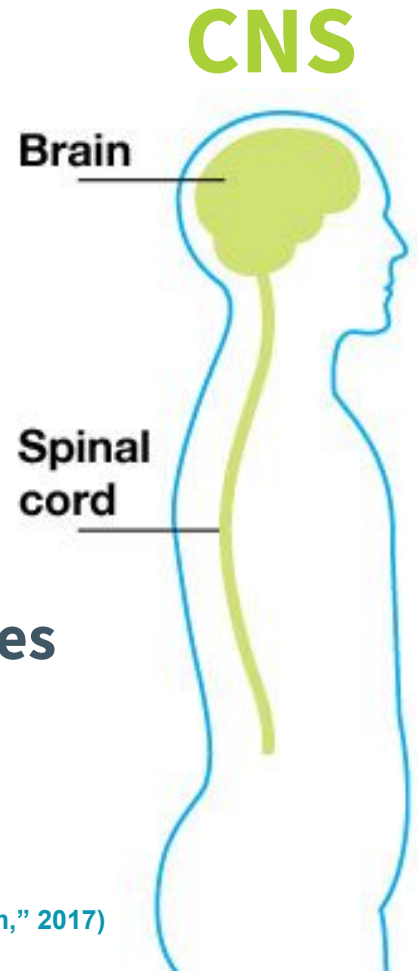
PATHOPHYSIOLOGY



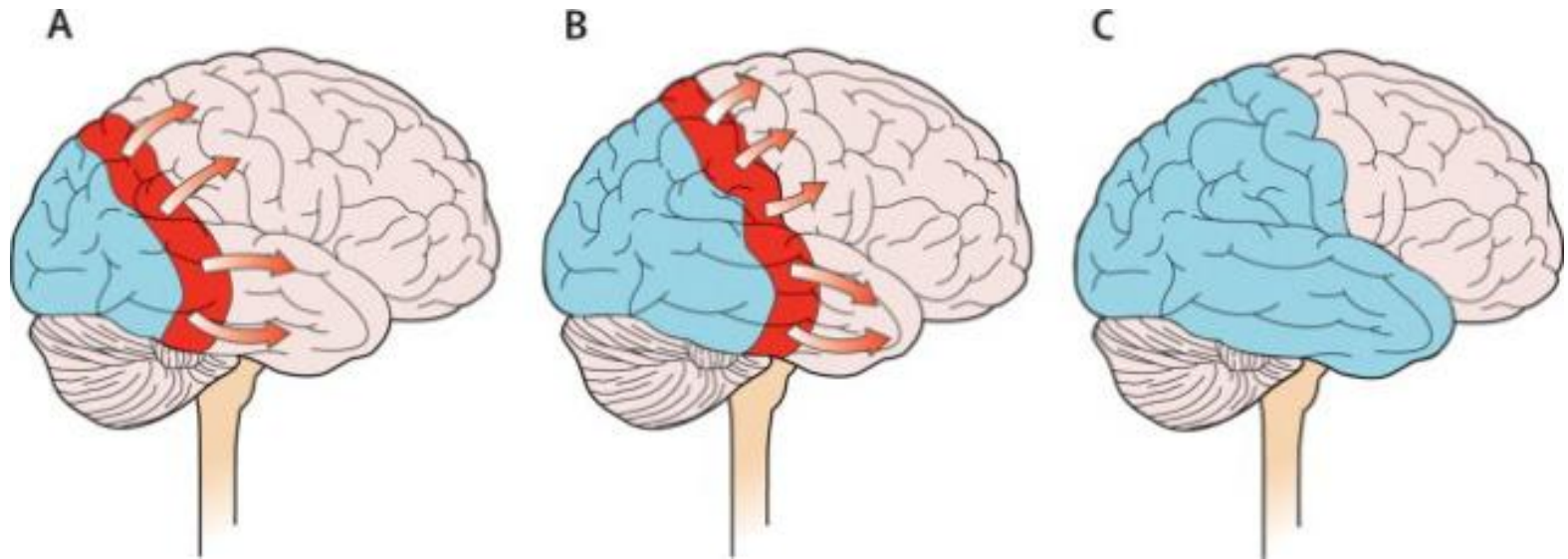
The disordered physiological processes associated with disease or injury

PATHOPHYSIOLOGY

- **Neurovascular disorder**
 - Result of dysfunction in CNS
- **Dysfunction of the CNS**
 - Is related to cortical spreading
- **Headache pain associated with migraines**
 - Connected to the activation of trigeminal nerves

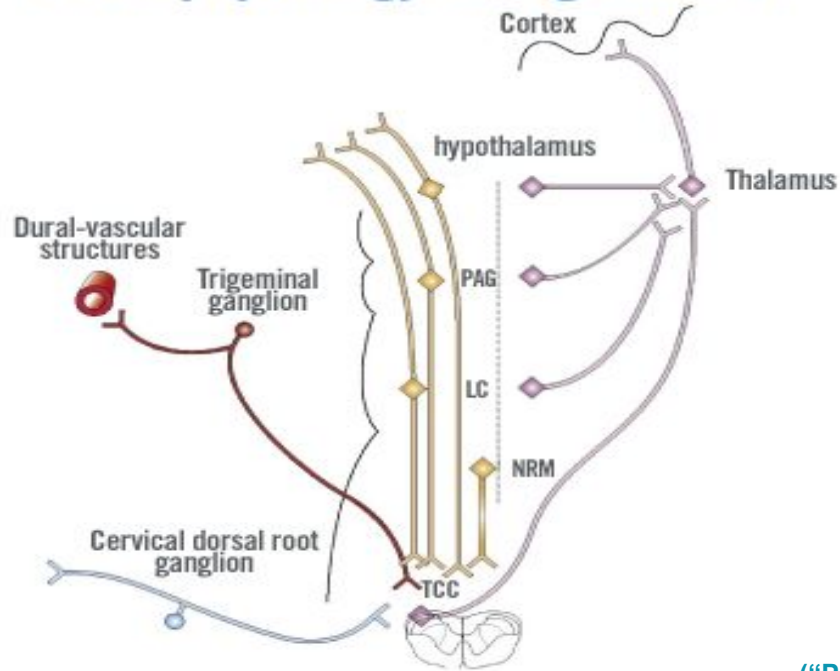


CORTICAL SPREADING DEPRESSION



TRIGEMINOVASCULAR SYSTEM

Pathophysiology of migraine Fig. 1



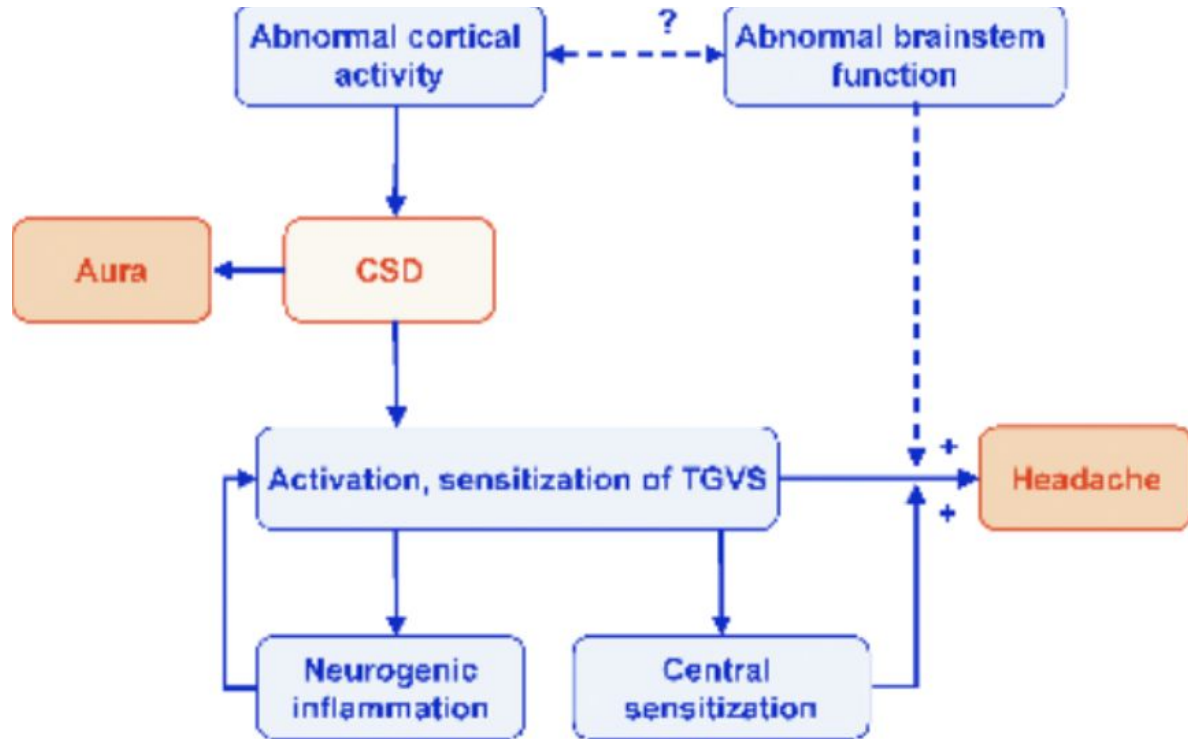
4

MECHANISMS



Interacting parts and processes that produce one or more effects

MOLECULAR MECHANISM



GENOME-WIDE STUDY

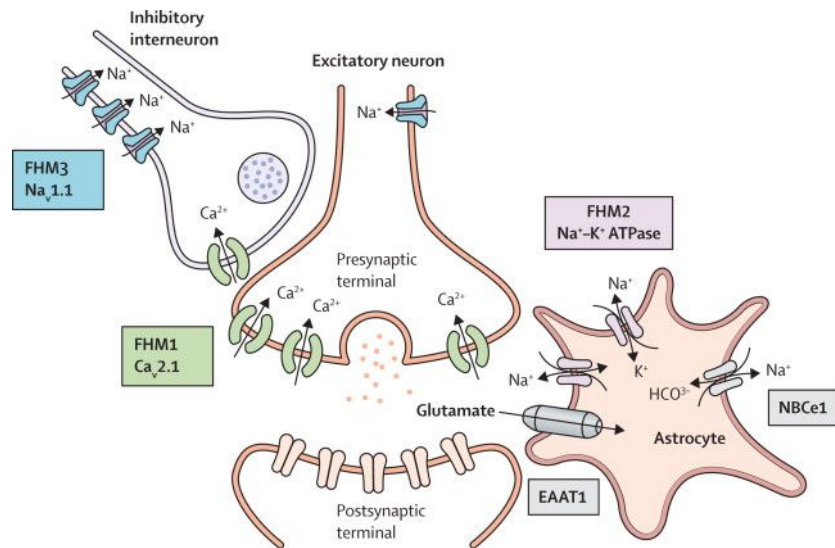
- **95% of cases** due to single nucleotide polymorphism
 - Glutamate leading to hyper excitability
- **Frameshift mutation** with migraine trait
 - Encodes TRESK: Potassium channel involved in pain pathways



FAMILIAL HEMIPLEGIC MIGRAINE

3 Types

- 1 FHM1: Mutation in CACNA1A1
- 2 FHM2: Mutation in ATP1A2
- 3 FHM3: Mutation in SCN1A



(Russel, 2011)

5

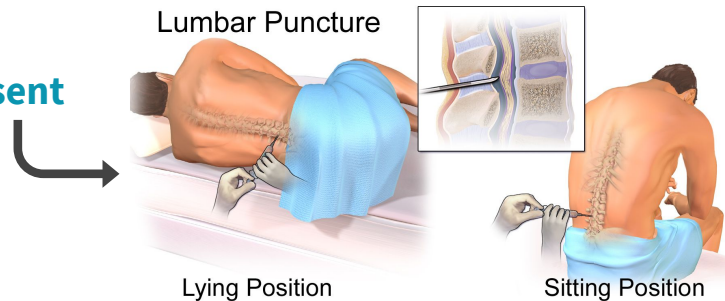
DIAGNOSIS



Medical History, Symptoms, Physical Test, Other Examinations

EXAMINATIONS

- **BLOOD TEST**
 - Blood vessel problem
 - Infections in spinal cord, brain
 - Other toxins
- **MAGNETIC RESONANCE IMAGING & CT**
 - Detailed images of brain, blood vessels
 - Tumors, strokes, bleeding infections
- **SPINAL TAP**
 - If infections present



6

TREATMENT



Pain & Preventive Medications ----> Frequency, Severity, Degree of Disability

1

PAIN RELIEVING

Acute treatment

- **PAIN RELIEVERS**

- Aspirin or Ibuprofen
- Tylenol



- **TRIPTANS**

- Constrict blood vessels and block pain pathways

- **ERGOTS**

- Effective if pain lasts 48 hours

- **ANTI-NAUSEA**

- **OPIOIDS**

- **GLUCOCORTICOIDS**



Prescribed only if...

- 4+ devastating attacks per month & last 12+ hours
- Pain relievers not effective & prolonged numbness and weakness
- **CARDIOVASCULAR DRUGS**
 - Beta Blockers (treat high blood pressure, coronary artery disease)
- **ANTIDEPRESSANTS**
 - Affecting level of serotonin and other brain chemicals
- **ANTI-SEIZURE**
 - Some shown to reduce frequency
- **ONABOTULINUMTOXINA (Botox)**
 - Chronic Migraines

3

ALTERNATIVE MEDICINE

- Acupuncture
- Biofeedback
- Massage Therapy
- Cognitive Behavioural Therapy
- Herbs
- Vitamins
- Minerals



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QUESTION #1

Of these 5 symptoms, which of these is not related to a migraine.

- A) Recurring intense pain
- B) Pain is not localized
- C) Experience of an aura
- D) Dull severity
- E) B and D

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QUESTION #2

Which major structure is involved in the activation of the trigeminovascular system?

- A) Hypothalamus
- B) Trigeminal ganglion
- C) Pituitary Gland
- D) Basal Ganglia

QUESTION #2

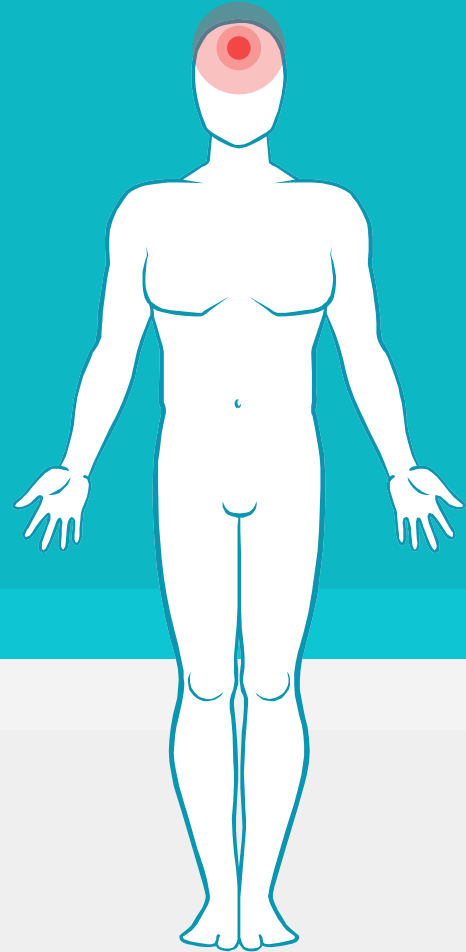
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MIGRAINES



QUESTIONS, COMMENTS, FEEDBACK?



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