

Headache Master School Japan (HMSJ)-Osaka 2016

23 October, 2016

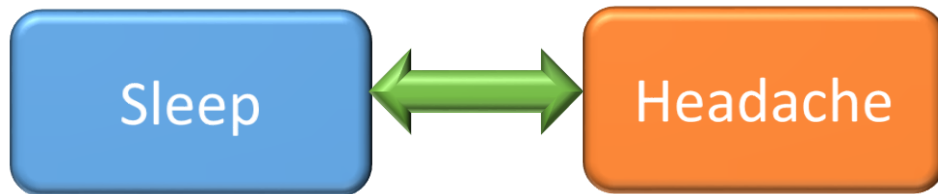
Diagnosis and management of sleep apnea headache

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- Headache: a symptom of primary sleep disturbances
- Sleep disturbance: symptom of a primary headache disorder
- Sleep disturbances and headache: both manifestations of a similar underlying pathogenesis

Relationship between sleep and headache

Sleep-related headache (during or after sleep)

Sleep-phase-related headaches

III, IV, REM: migraine

REM: cluster headache, chronic paroxysmal hemicrania

Length of sleep and headaches

Excessive deep sleep

Lack of sleep

Sleep disruption

Sleep relieves headaches

Migraine and other types of headaches

Sleep disorders and headaches

Sleep apnea and headaches

Somnambulism and headaches

Other parasomnias and headaches

Effect of headaches on sleep

Minimal to major sleep disruption

Dreams and headaches

Background

- Close association between Headache and obstructive sleep apnea (OSA)
- Headaches reported in 15-50% of OSA patients
(Alberti, Sleep Med Rev, 2006)
- Morning headaches:
 - Reported in 18-60% of OSA patients
 - Recognized as OSA related symptoms such as daytime sleepiness and snoring
 - Related to OSA has been categorized as “Sleep apnea headache” in ICHD-3beta

ICHD-3 code	Diagnosis
10.	Headache attributed to disorder of homoeostasis
10.1	Headache attributed to hypoxia and/or hypercapnia
10.1.1	High-altitude headache
10.1.2	Headache attributed to aeroplane travel
10.1.3	Diving headache
10.1.4	Sleep apnoea headache
10.2	Dialysis headache
10.3	Headache attributed to arterial hypertension
10.3.1	Headache attributed to pheochromocytoma
10.3.2	Headache attributed to hypertensive crisis without hypertensive encephalopathy
10.3.3	Headache attributed to hypertensive encephalopathy
10.3.4	Headache attributed to pre-eclampsia or eclampsia
10.3.5	Headache attributed to autonomic dysreflexia
10.4	Headache attributed to hypothyroidism
10.5	Headache attributed to fasting
10.6	Cardiac cephalalgia
10.7	Headache attributed to other disorder of homoeostasis

Diagnostic criteria of sleep apnea headache according to ICHD-3 beta (code 10.1.4)

Diagnostic criteria:

A. Headache present on awakening after sleep and fulfilling criterion C (Sleep apnea headache)

B. Sleep apnea (apnea-hypopnea index ≥ 5) has been diagnosed

C. Evidence of causation demonstrated by at least two of the following:

1. Headache has developed in temporal relation to the onset of sleep apnea

2. Either or both of the following:

a) Headache has worsened in parallel with worsening of sleep apnea

b) Headache has significantly **improved or remitted in parallel with improvement** in or resolution of sleep apnea

3. Headache has at least one of the following:

a) Recurs on >15 days per month

b) All of the following:

(i) bilateral location

(ii) pressing quality

(iii) not accompanied by nausea, photophobia

c) resolves **within 4 hours**

D. Not better accounted for by another ICHD-3 diagnosis.

Major changes:

- Headache duration extended to **4 hours**
- **No time restriction** on headache improvement following appropriate therapy for OSA

Case 1

35 y.o.man

Habitual snoring

29
yrs

Morning headache

10
yrs

Daytime sleepiness

PMH: bronchial asthma

BP 138/87mmHg

Narrow pharynx (+),

BMI 29.0 kg/m²

Cephalogram; narrow airway

Epworth sleepiness scale 20 (>10)

Sleep duration; 6 hours with a regular sleep-wake cycle (12am-6am)

Alcohol; Beer 2-3 cans, 3-4/w

Smoking (-)

Caffeine; 2-3 cups of coffee

Characteristics of morning headache

Frequency

- 1/w

Location

- R of L retro-orbital region

Quality

- Throbbing

Accompanying symptoms

- No photophobia or nausea

Duration

- 10-20 mins

C3. Headache has at least **one of the following three characteristics:**

~~X~~ a) Recurs on >15 days per month

~~X~~ b) All of the following:

~~X~~ (i) bilateral location

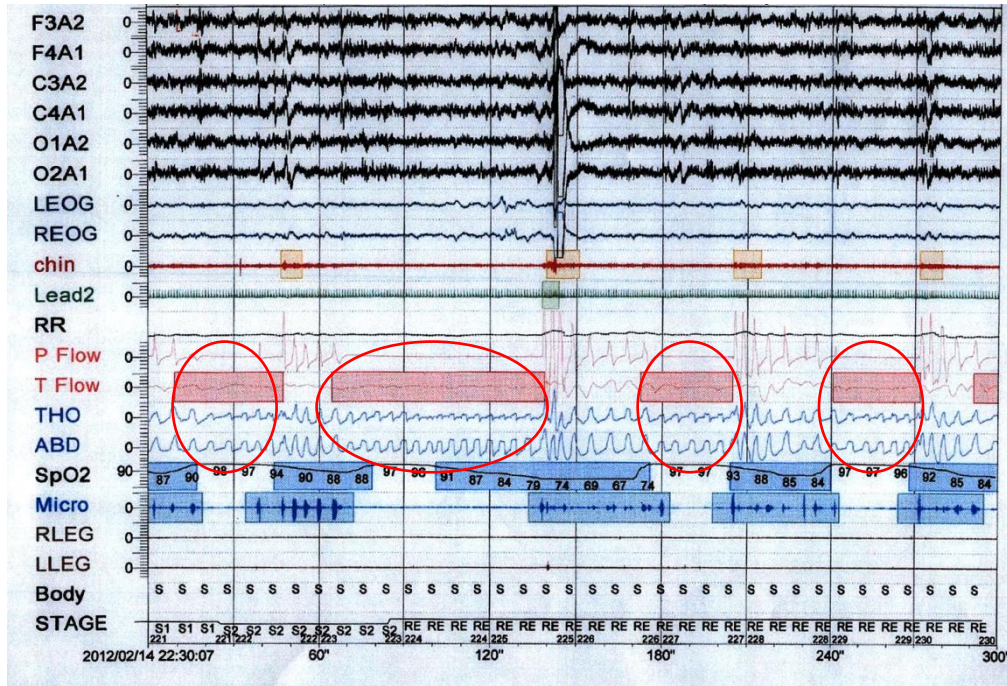
~~X~~ (ii) pressing quality

(iii) not accompanied by nausea, photophobia or phonophobia

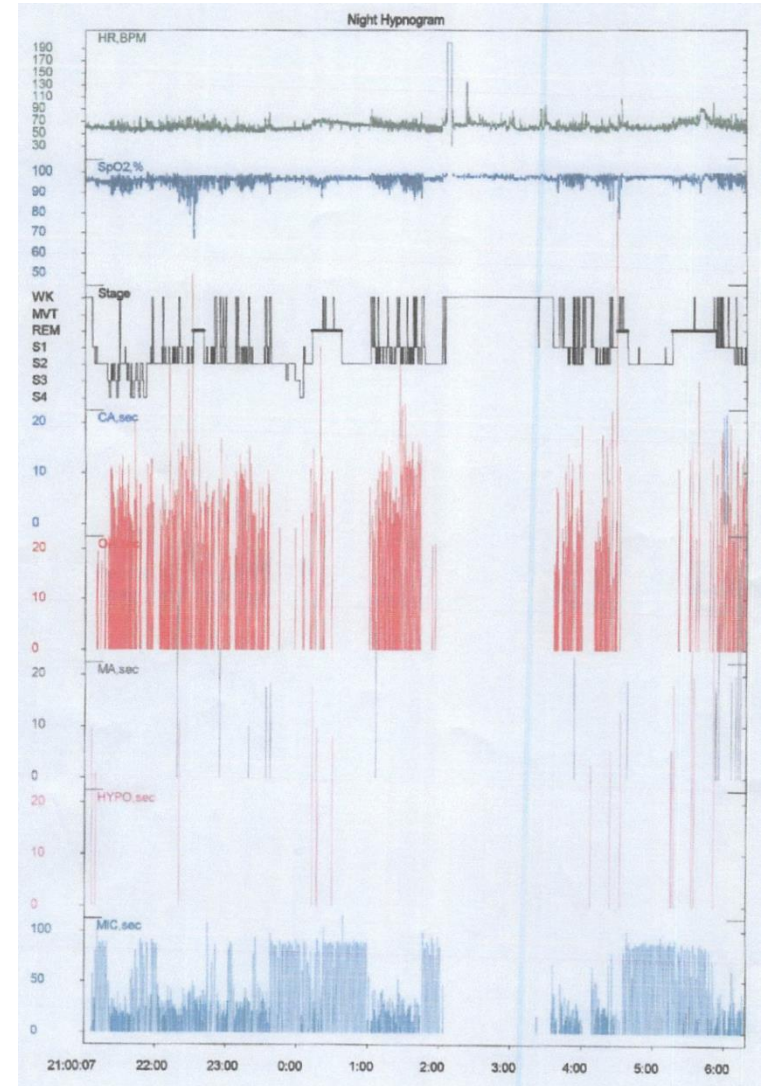
c) resolves within 4 hours

Headache occurs when waking in the morning and sometimes wakes him from sleep

Polysomnography (PSG)



Recurrent episodes of sleep apnea during sleep



PSG findings

Total sleep time		424 min
Sleep latency		6 min
REM sleep latency		85.5 min
Sleep efficiency		76%
Wake after sleep onset		128 min
Stage REM		17.7% (75 min)
Stage NREM	Stage 1	22.5% (95.5 min)
	Stage 2	53.4% (226.5 min)
	Stage 3	6.4% (27 min)
Apnea-hypopnea index (AHI)		47/h
Obstructive sleep apnea		42.3/h
Hypopnea		2.3/h
3% oxygen desaturation index		37.5/h
Arousal index		38.3/h
Periodic limb movement index		0/h

Severe obstructive sleep apnea

Diagnostic criteria for sleep apnea headache:

- A. Headache present on awakening after sleep and fulfilling criterion C
- B. Sleep apnea (apnea-hypopnea index ≥ 5) has been diagnosed
- C. Evidence of causation demonstrated by at least 2 of the following:
 - 1. Headache has developed in temporal relation to the onset of sleep apnea
 - 2. Either or both of the following:
 - a) Headache has worsened in parallel with worsening of sleep apnea
 - b) Headache has significantly improved or remitted in parallel with improvement in or resolution of sleep apnea
 - 3. Headache has at least 1 of the following 3 characteristics:
 - a) Recurs on >15 days per month
 - b) All of the following:
 - (i) bilateral location
 - (ii) pressing quality
 - (iii) not accompanied by nausea, photophobia or phonophobia
 - c) resolves within 4 hours
- D. Not better accounted for by another ICHD-3 diagnosis.

- Following CPAP therapy AHI normalized
- Sleepiness improved
- Headache resolved and recurred only when the patient forgot CPAP use

Diagnosis: Sleep apnea headache

Case 2

52 y.o.man

Morning headache

Sleep apnea /
snoring

7 yrs

PMH: glaucoma

BP 119/87mmHg, P 56/min

BMI 21.1 kg/m²

Cephalogram; narrow airway

Sleep duration; 7 hours,
regularly

Alcohol; Beer 1 can/day

Tobacco (-)

Caffeine; 3-4 cups of
coffee/day

Characteristics of morning headache

Frequency	• 2/month
Location	• Neck, forehead
Quality	• Pressing
Duration	• 6 hours
Accompanying symptoms	• No photophobia or nausea

C3. Headache has at least **one of the following three characteristics:**

a) Recurs on >15 days per month

b) All of the following:

(i) bilateral location

(ii) pressing quality

(iii) not accompanied by nausea, photophobia or phonophobia

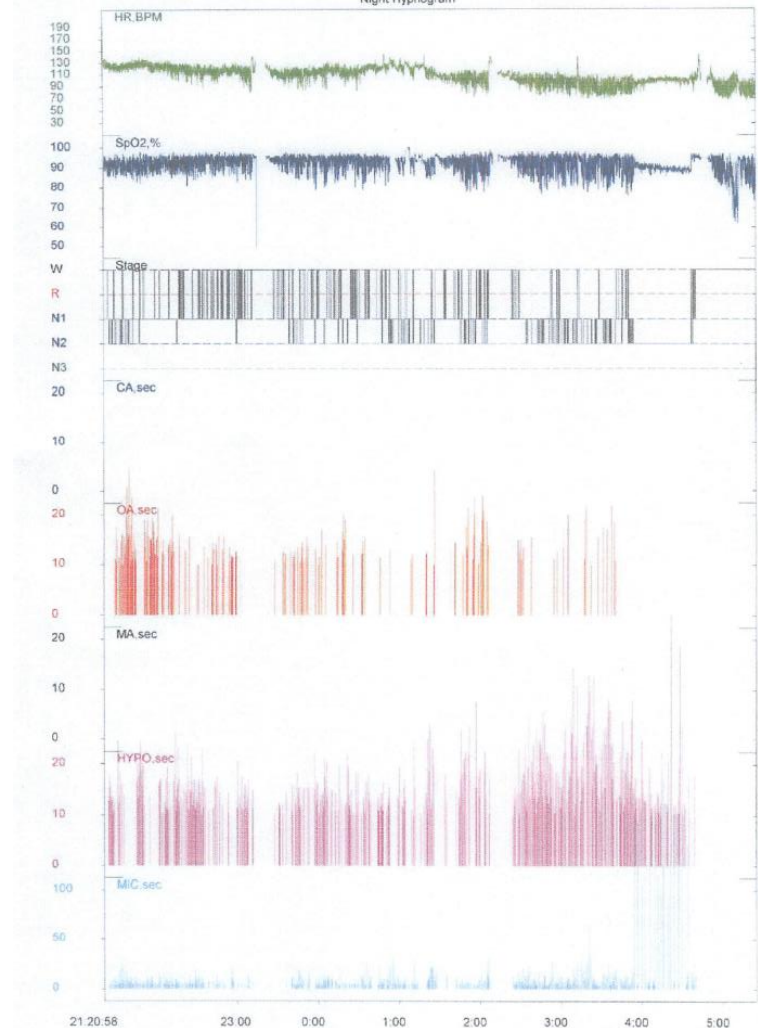
c) resolves within 4 hours

The patient wakes up with a headache

Polysomnographic findings

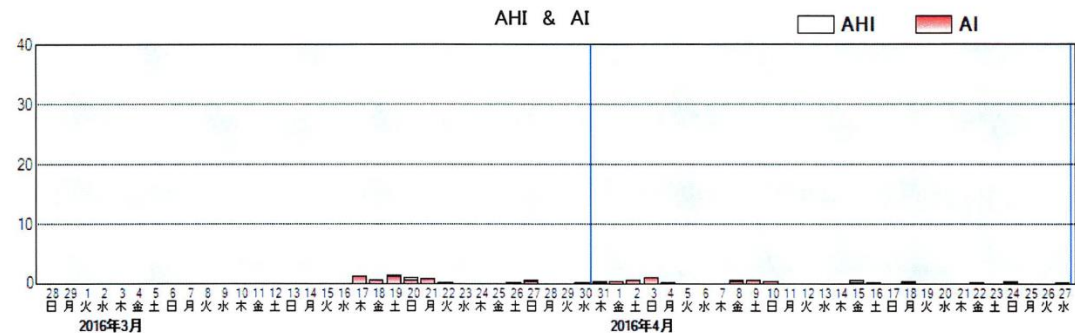
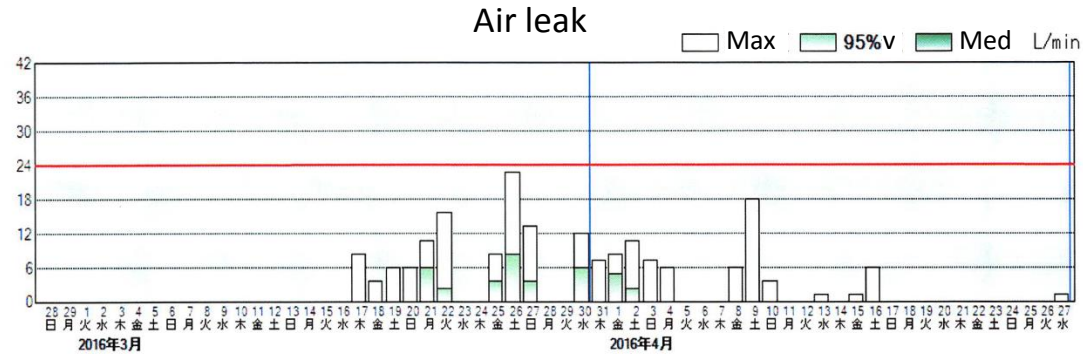
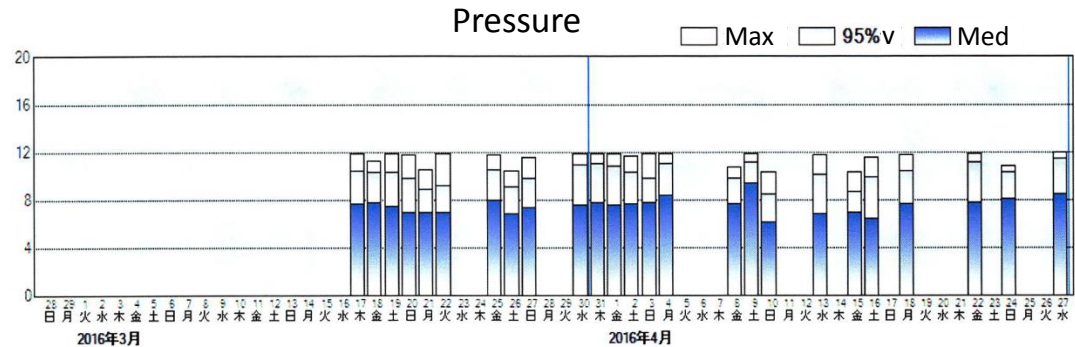
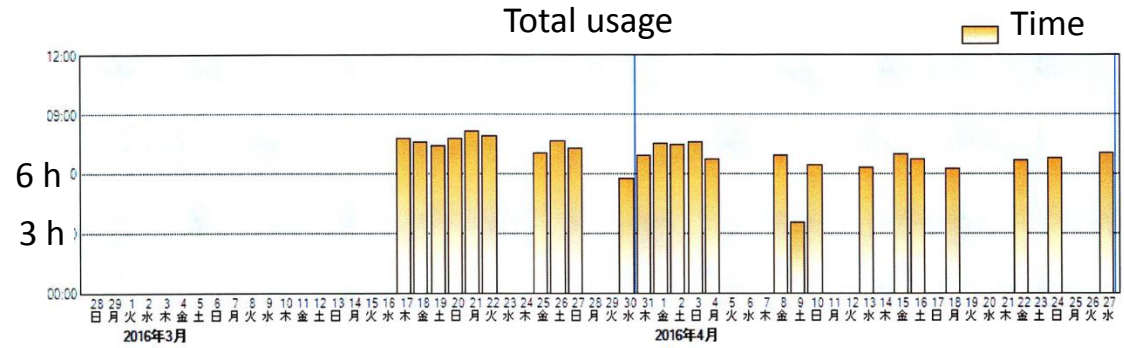
Hypnogram

Total sleep time	460.5 min	
Sleep latency	43 min	
REM sleep latency	93.5 min	
Sleep efficiency	84.7%	
Wake after sleep onset	40.5 min	
Stage REM	19.7% (90.5 min)	
Stage NREM	Stage 1	13.9% (64 min)
	Stage 2	59.7% (275 min)
	Stage 3	6.7% (31 min)
Apnea-hypopnea index (AHI)	22/h	
3% oxygen desaturation index	3.3/h	
Arousal index	27.1/h	
Periodic limb movement index	0.05/h	



Moderate obstructive sleep apnea

- CPAP therapy introduced
- AHI decreased within normal range (0.3-0.6/h)
- Good CPAP adherence : daily CPAP use of 7h26min, CPAP usage > 4h/d of 71.4%
- During 2 months follow up, 2 headaches with mild intensity occurred



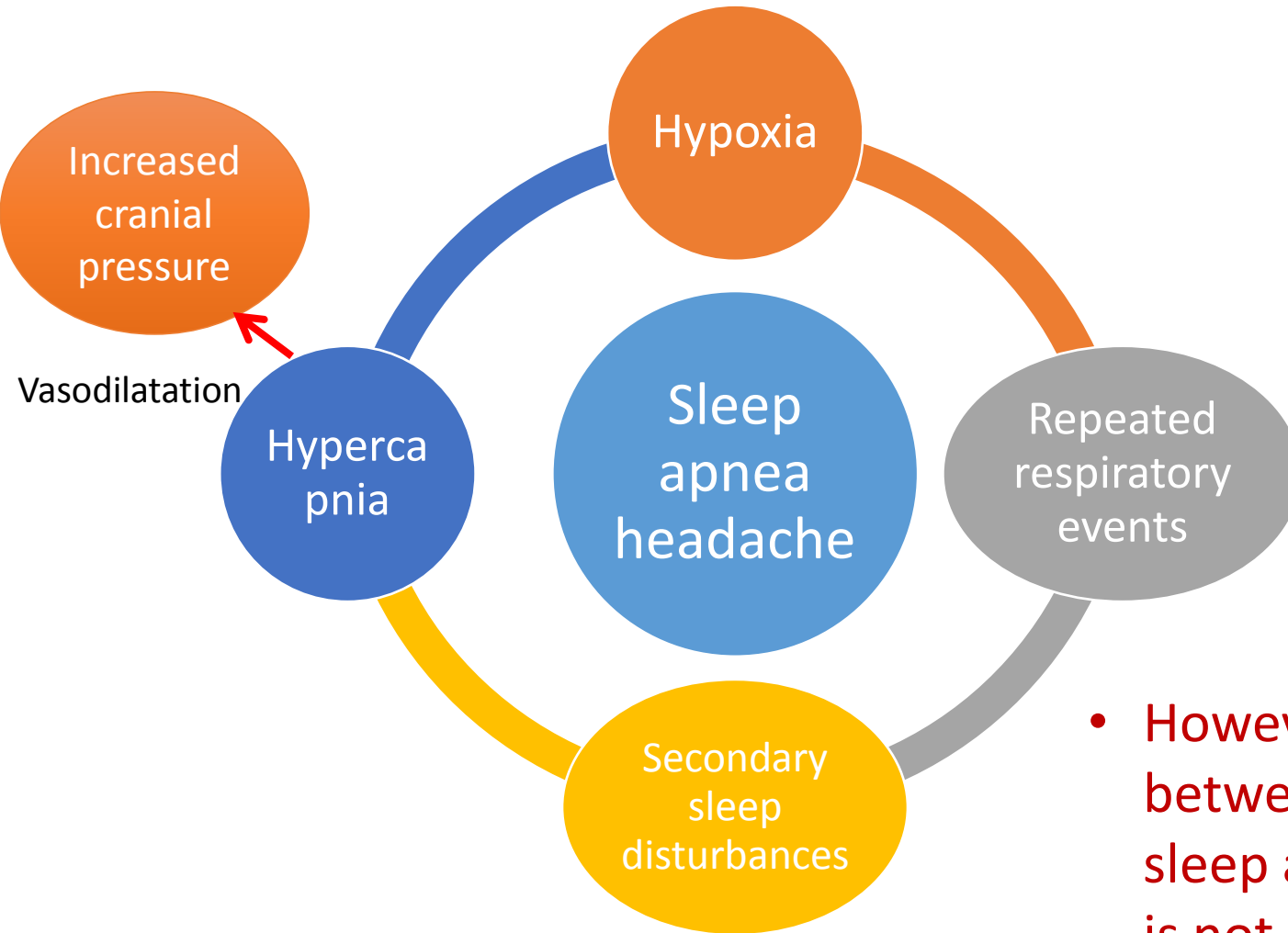
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 - (iii) not accompanied by nausea, photophobia or phonophobia
 - c) resolves within 4 hours
- D. Not better accounted for by another ICHD-3 diagnosis.

- Following CPAP therapy AHI normalized
- Headache frequency **decreased**
(2/m \rightarrow 1/m)

Diagnosis: Sleep apnea headache

Pathophysiology of sleep apnea headache



- However, association between those with sleep apnea headache is not proven

Summary

- ✓ Sleep apnea headaches can show various characteristics of headache quality, location and frequency
- ✓ Detailed questioning required for assessing temporal relationship between onset of sleep apnea and morning headache in OSA patients
- ✓ For patients with less frequent/ mild quality of sleep apnea headache, it may be difficult to assess CPAP effect
- ✓ Morning headaches which are unresponsive to OSA treatment should prompt to consider other causes

Thank you for your attention

Acknowledgment

Prof. Koichi Hirata

- Department of Neurology, Dokkyo Medical University

Prof. Masayuki Miyamoto

- Department of Clinical Medicine for Nursing, Dokkyo Medical University School of Nursing

Prof. Tomoyuki Miyamoto

- Department of Neurology, Dokkyo Medical University Koshigaya Hospital