# **International Headache Congress** 2023 – Seoul, Korea, 14-17 September

IHC23-PO-312 **Date and time of poster walk:** Saturday 16th September - 09:45 - 10:45

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# Abstract

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- We present seven patients with recurrent thunderclap headache due to reversible cerebral vasoconstriction syndrome (RCVS) who were successfully treated with lasmiditan.
- Six of seven had history of migraine. In both cases, verapamil was prescribed after • the diagnosis of RCVS, but non-steroidal anti-inflammatory drugs and paracetamol were ineffective against Thunderclap headache (TCH). No serious adverse events were observed during lasmiditan treatment.

# Introduction

- RCVS often occurs with TCH. Transient segmental cerebral artery stenosis is observed on head magnetic resonance imaging (MRI) or cerebral angiography during the course of the disease. In Asia, RCVS mainly occurs in middle-aged women with a history of migraines.
- Dysfunction of cerebral vascular tone may play key roles in the pathophysiology of RCVS.
- The pathogenesis of RCVS is complex, and the mechanisms underlying TCH are not yet understood.

### Patients

| No. | Age | Sex | Migraine | On set       | Lasmiditan<br>Start day | BMI<br>(m <sup>2</sup> /kg) | Duration of migraine (year) | Triptan | Sys. | Dia. | Plus |
|-----|-----|-----|----------|--------------|-------------------------|-----------------------------|-----------------------------|---------|------|------|------|
| 1   | 53  | F   | MwoA     | Lunch        | 7                       | 16.44                       | 13                          | Non     | 142  | 99   | 86   |
| 2   | 42  | F   | MwoA     | Bath         | 14                      | 18.67                       | 16                          | Non     | 137  | 108  | 76   |
| 3   | 56  | F   | MwoA     | Work         | 3                       | 20.06                       | 21                          | ET      | 99   | 62   | 89   |
| 4   | 60  | F   | MwoA     | Conversation | 0                       | 20.83                       | 35                          | Non     | 179  | 97   | 83   |
| 5   | 46  | Μ   | MwoA     | Non          | 3                       | 21.80                       | 16                          | Non     | 167  | 101  | 73   |
| 6   | 57  | Μ   | ?        | Work         | 5                       | 25.39                       | ?                           | Non     | 101  | 71   | 73   |
| 7   | 45  | F   | MwoA     | Drive        | 4                       | 19.83                       | 25                          | Non     | 128  | 93   | 83   |

MwoA: migraine without aura, Lasmiditan Start day: Lasmiditan was initiated from the onset of RCVS, BMI: body mass index (m<sup>2</sup>/kg), Triptan: history of triptan use, ET: eletriptan, Sys.: systolic blood pressure, Dia.: diastolic blood pressure

- All patients were prescribed verapamil 240 mg/day.
- No serious adverse events were observed in each patients during lasmiditan treatment.

#### Representative patient (No.1)



Day 1

Representative patient (No.2)



Day 13

## Discussion

#### **Proposed model of the pathophysiology of RCVS**



### Pathophysiology of TCH

- Calcitonin gene-related peptide (CGRP) may be involved in a reflex mechanism to  $\bullet$ counter cerebral vasoconstriction.
- The increase in CGRP concentration assumed to accompany cerebral vasospasm in RCVS may induce headaches in RCVS patients especially with a history of migraine.



Chen SP, Wang SJ. Pathophysiology of reversible cerebral vasoconstriction syndrome. Journal of Biomedical Science 2022; 29 (1): 72.





# **Release of CGRP?**



# We hypothesized that in RCVS patients, especially those with a history of

migraine, the increase in CGRP concentration associated with cerebral

### vasoconstriction may be responsible for inducing TCH.

### Lasmiditan

- 5-HT 1F receptors are present in the meninges, trigeminal ganglia, trigeminal nucleus caudalis (TNC), hypothalamus, thalamus, cortex, and other central nerves involved in the regulation of migraine pain signaling, as well as in peripheral trigeminal nerve endings.
- Lasmiditan is highly selective for human 5-HT 1F receptors, activates 5-HT 1F receptors in the periphery, inhibits the presynaptic release of CGRP from trigeminal nerve endings, and acts on 5-HT 1F receptors in the center through the BBB, modulating central sensitization of TNC and thalamus.

### Limitation

- First, it was performed in a single ethnic population (Asians).
- In these cases, it is also possible that RCVS exacerbated the preexisting migraine and caused severe headache attacks.
- Although the study was conducted at two institutions, which limits the generalizability of the results and does not fully explain the subjective nature of the treatment effect, we hope to contribute to future clinical practice by focusing on patients' perception of benefit and safety.

# Conclusion

In cases of RCVS where patients have a history of migraine with no new foci of cerebrovascular disease, lasmiditan may be a promising treatment option when NSAIDs and paracetamol are ineffective against TCH.

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COI Disclosure There is no COI relationship with any company related to the presentation that should be disclosed.

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