Visual Snow Syndrome and Its Relationship to Tinnitus

Matthew Renze

24th Annual International Conference
Management of the Tinnitus & Hyperacusis Patient
Other Visual Symptoms

• Vibration in text
• Trailing images
• Bright-light issues
• Night-vision issues
• Halos at night
Other Auditory Symptoms

• Loud-noise issues
• Conversation issues
• Environmental-noise issues
• Ear noise with volume changes
Other Tactile Symptoms

- Pulsating buzzing
- Fine tremors
‘Visual snow’ – a disorder distinct from persistent migraine aura

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Visual Snow

“continuous tiny dots in the entire visual field similar to noise of an analog television”
Visual Snow Syndrome

• Palinopsia
• Floaters
• Blue-field entoptic phenomena
• Photophobia
• Nyctalopia
• Tinnitus

Source: Brain 2014: 137; 1419–1428
http://brain.oxfordjournals.org/content/137/5/1419.long
2014 Wolff Award Paper

The Relation Between Migraine, Typical Migraine Aura and “Visual Snow”

Christoph J. Schankin, MD; Farooq H. Maniyar, MD; Till Sprenger, MD; Denise E. Chou, MD; Michael Eller, MD; Peter J. Goadsby, MD, PhD

Objective.—To assess the relationship between the phenotype of the “visual snow” syndrome, comorbid migraine, and typical migraine aura on a clinical basis and using functional brain imaging.
What does this have to do with tinnitus?
## Associated Visual Snow Symptoms

<table>
<thead>
<tr>
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Clinical Study

Visual snow: A thalamocortical dysrhythmia of the visual pathway?

Jenny L. Lauschke\textsuperscript{a,b}, Gordon T. Plant\textsuperscript{c}, Clare L. Fraser\textsuperscript{a,*}

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Thalamocortical dysrhythmia: A neurological and neuropsychiatric syndrome characterized by magnetoencephalography

Rodolfo R. Llinás*†, Urs Ribary*, Daniel Jeanmonod‡, Eugene Kronberg*, and Partha P. Mitra§

*Department of Physiology and Neuroscience, New York University School of Medicine, 550 First Avenue, New York, NY 10016; †Universitätsspital Zurich, Neurochirurgische Klinik, Sternwartstrasse 6, CH-8091 Zurich, Switzerland; and §Bell Laboratories, Lucent Technologies, 600 Mountain Avenue, Murray Hill, NJ 07974

Contributed by Rodolfo R. Llinás, October 21, 1999

Spontaneous magnetoencephalographic activity was recorded in awake, healthy human controls and in patients suffering from neurogenic pain, tinnitus, Parkinson’s disease, or depression. Compared with controls, patients showed increased low-frequency \( \theta \) rhythmicity, in conjunction with a widespread and marked increase of coherence among high- and low-frequency oscillations. These data indicate the presence of a thalamocortical dysrhythmia, which we propose is responsible for all the above mentioned conditions. This coherent \( \theta \) activity, the result of a resonant interaction between thalamus and cortex, is due to the generation of low-threshold calcium spike bursts by thalamic cells. The presence of

Patients were carefully selected by using standard neurological/psychiatric diagnostic procedures.

Magnetoecephalography (MEG) Recordings and Analysis. Magnetic recordings were obtained at our laboratory with a whole-head, 148-channel MEG system Magnes 2500 WH (Biomagnetic Technologies, San Diego). During the recording sessions, the subject was placed on a bed with the MEG recording port (Fig. 1A) surrounding the subject’s head to record the magnetic fields from different angles over the head surface. Spontaneous brain activity was continuously recorded for 10 min while the subject

Source: Proceedings of the National Academy of Sciences 1999
http://www.pnas.org/content/96/26/15222
Thalamocortical dysrhythmia: a theoretical update in tinnitus

Dirk De Ridder1,*, Sven Vanneste2, Berthold Langguth3 and Rodolfo Linas4

1BRAFiN, Section of Neurosurgery, Department of Surgical Sciences, Dunedin School of Medicine, University of Otago, Dunedin, New Zealand, 2School of Behavioral and Brain Sciences, University of Texas at Dallas, Richardson, TX, USA, 3Department of Psychiatry and Psychotherapy, University of Regensburg, Regensburg, Germany, 4Department of Neuroscience and Physiology, New York University School of Medicine, New York, NY, USA

Tinnitus is the perception of a sound in the absence of a corresponding external sound source. Pathophysiologically it has been attributed to bottom-up deafferentation and/or top-down noise-cancelling deficit. Both mechanisms are proposed to alter auditory thalamocortical signal transmission, resulting in thalamocortical dysrhythmia (TCD). In deafferentation, TCD is characterized by a slowing down of resting state alpha to theta activity associated with an increase in surrounding gamma activity, resulting in persisting cross-frequency coupling between theta and gamma activity. Theta burst-firing increases network synchrony and recruitment, a mechanism, which might enable long-range synchrony, which in turn could represent a means for finding the missing thalamocortical information and for gaining access to consciousness. Theta oscillations could function as a carrier wave to integrate the tinnitus-related focal auditory gamma activity in a consciousness enabling network, as
Symptom Aggravators

• Stress
• Lack of sleep
• Cold/flu
• Alcohol
• Caffeine
• Too much sodium
• Too much sugar
Meditation reduces pain-related neural activity in the anterior cingulate cortex, insula, secondary somatosensory cortex, and thalamus.

Source: Frontiers in Neurology 2014;5:1489
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4460809/
Current Research

Visual Snow – a disorder distinct from persistent migraine aura
http://brain.oxfordjournals.org/content/137/5/1419.long

The Relationship Between Migraine, Typical Migraine Aura and Visual Snow
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Visual snow: A thalamocortical dysrhythmia of the visual pathway?
http://www.jocn-journal.com/article/S0967-5868(15)00653-0/fulltext
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Future Research

• Third study completed
• Fourth study in the works
• Research is crowd funded

www.eyeonvision.org

www.visualsnow.eu
Help Cure Visual Snow

https://www.gofundme.com/visual-snow
The Science of Mindfulness: A Research-Based Path to Well-Being

Professor Ronald D. Siegel
Harvard Medical School/Cambridge Health Alliance

www.thegreatcourses.com
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The Art of Living
Vipassana Meditation
As Taught by S. N. Goenka

William Hart

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www.dhamma.org
Conclusion

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1. Tinnitus is associated with VSS
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Conclusion

1. Tinnitus is associated with VSS
2. VSS provides insight into tinnitus
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Conclusion

1. Tinnitus is associated with VSS
2. VSS provides insight into tinnitus
3. Symptoms can be managed
It is possible to be in physical, mental or emotional pain, but to not be suffering from it.

Suffering is how we respond to pain.
Contact Info

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Thank You! : )