

Acufeni: stato dell'arte e prospettive



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Classificazione



- ◉ Acufene oggettivo – il suono è prodotto da strutture che circondano l'orecchio, in alcuni casi possono essere sentite anche dall'esaminatore
- ◉ Acufene soggettivo – il suono è avvertito solo dal paziente (il più comune)

Acufene



Sensazione di avvertire un suono che non esiste nel mondo esterno.

- ◉ 10% della popolazione ne è affetta
- ◉ 5% riferisce come molto disturbante la sensazione
- ◉ 1% la percentuale di pazienti nei quali la reazione emotiva è così importante da determinare un notevole impatto nella vita

Eziologia Acufene Soggettivo



○ Traumi acustici	20%
○ Altre patologie dell'orecchio	7%
○ Farmaci ototossici	2%
○ Traumi cranici	9%
○ Idiopatici	62%

Acufene soggettivo: i 3 attori

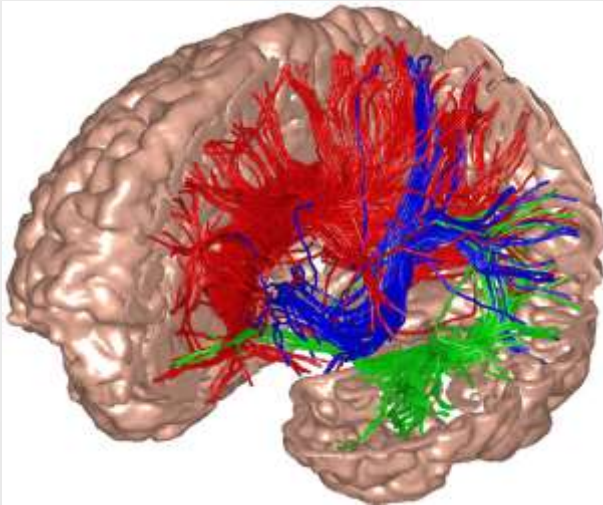


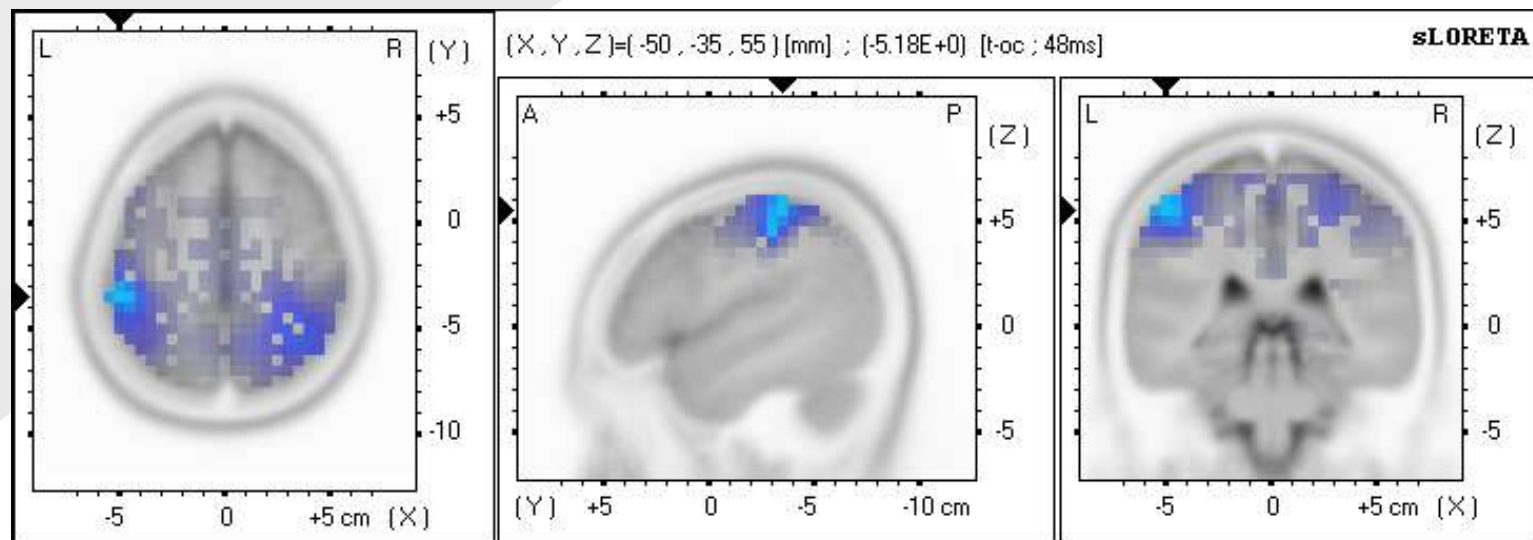
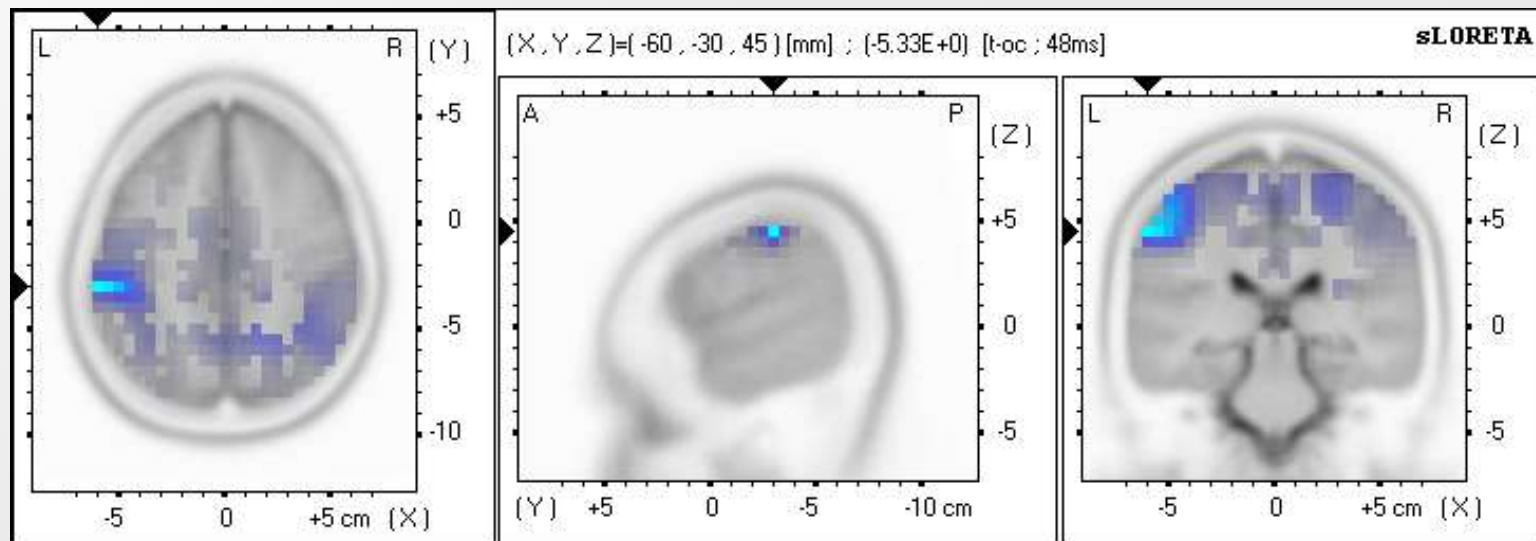
- ◉ Coclea
 - ◉ Vie Acustiche
- PRODUZIONE DELL'ACUFENE
- ◉ Sistema Limbico → MANTENIMENTO E DISTURBO GENERATO

Perception and Reaction is not the same [Hallam]

Disritmia Talamo Corticale: The “**Neural Code**”

Aumentata attività elettrica
nella banda gamma come
conseguenza di una
ipoacusia cocleare.





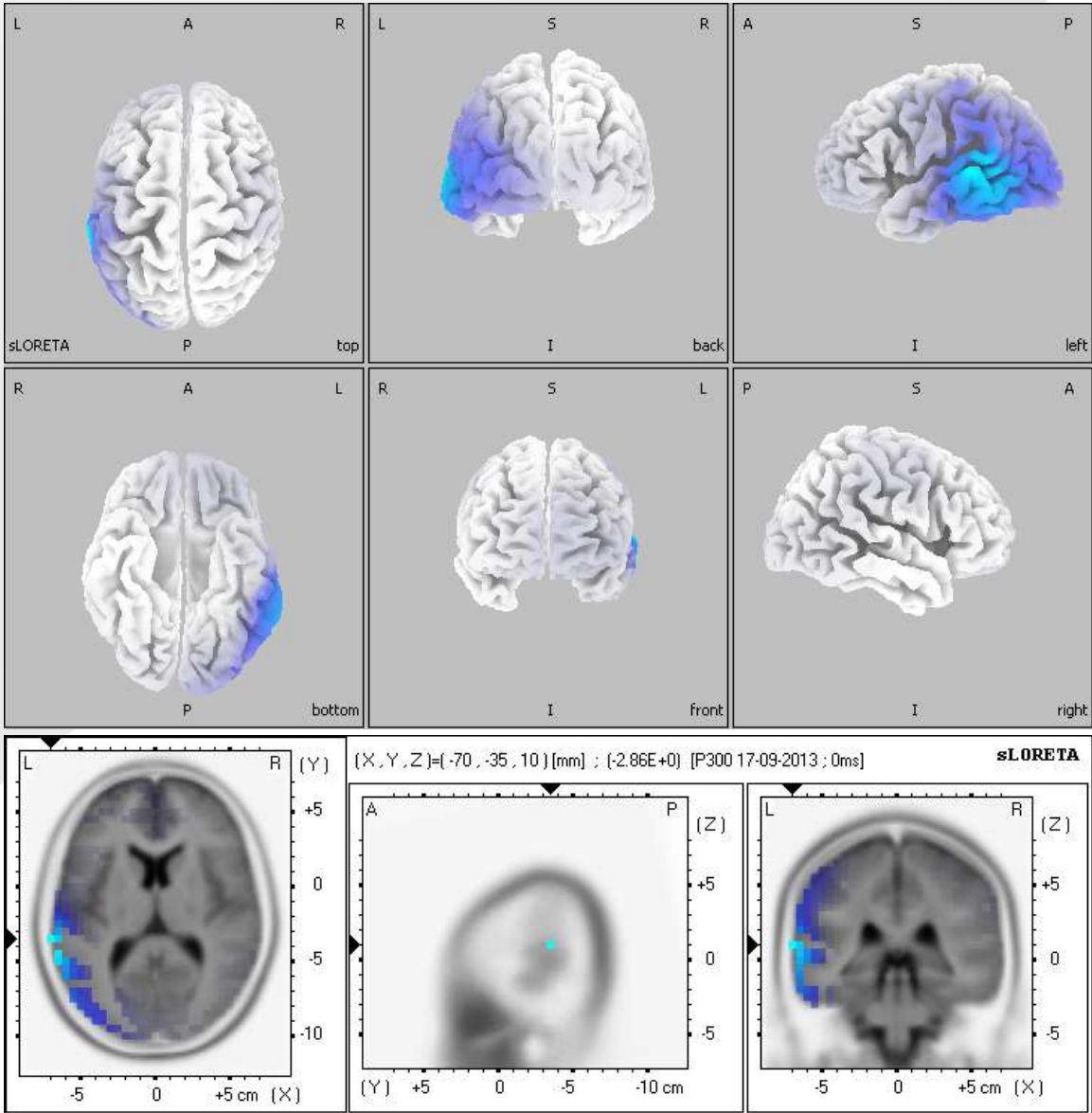
Long latency evoked potentials



Significant lower activation of the Left BA22, Superior Temporal Gyrus, Temporal lobe ($p < 0.05$) in patients.

Left BA22: understanding words

Right BA22: discrimination of sound intensity and pitch



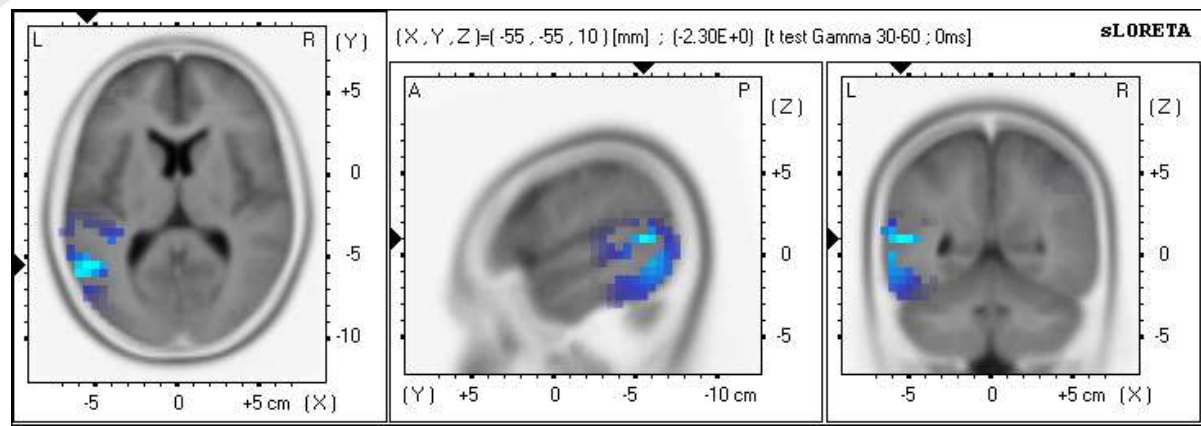
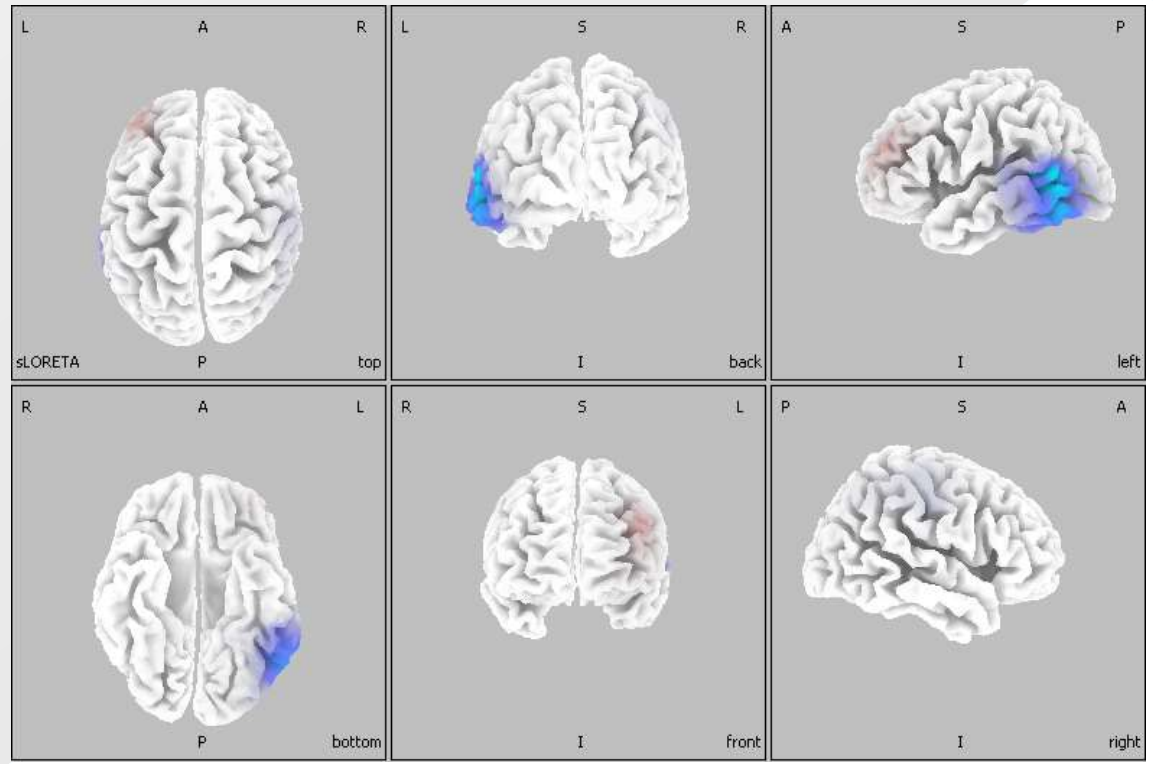
Differences in brain activity during resting state (eyes closed): patients vs controls



Patients:
 Decreased activity in the gamma frequency band (30-60 Hz) in the:
 Left BA39, Middle Temporal Gyrus, Temporal lobe

BA39:
 grapheme-phoneme conversion

Patients: n= 19
 Controls: n= 21



Differences in brain activity during resting state (eyes opened): patients vs controls



Patients:

Decreased activity in the alpha 2 frequency band (10.5-12 Hz) in the:

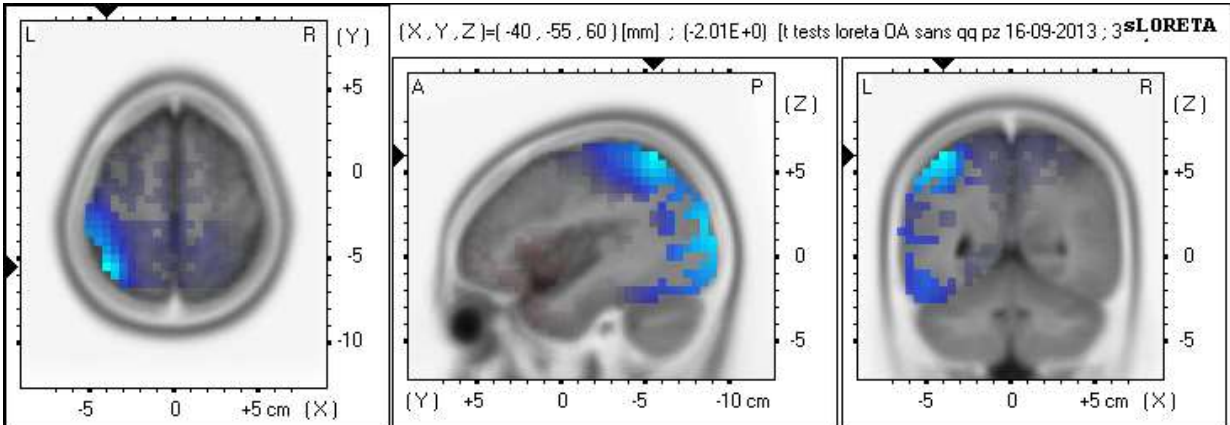
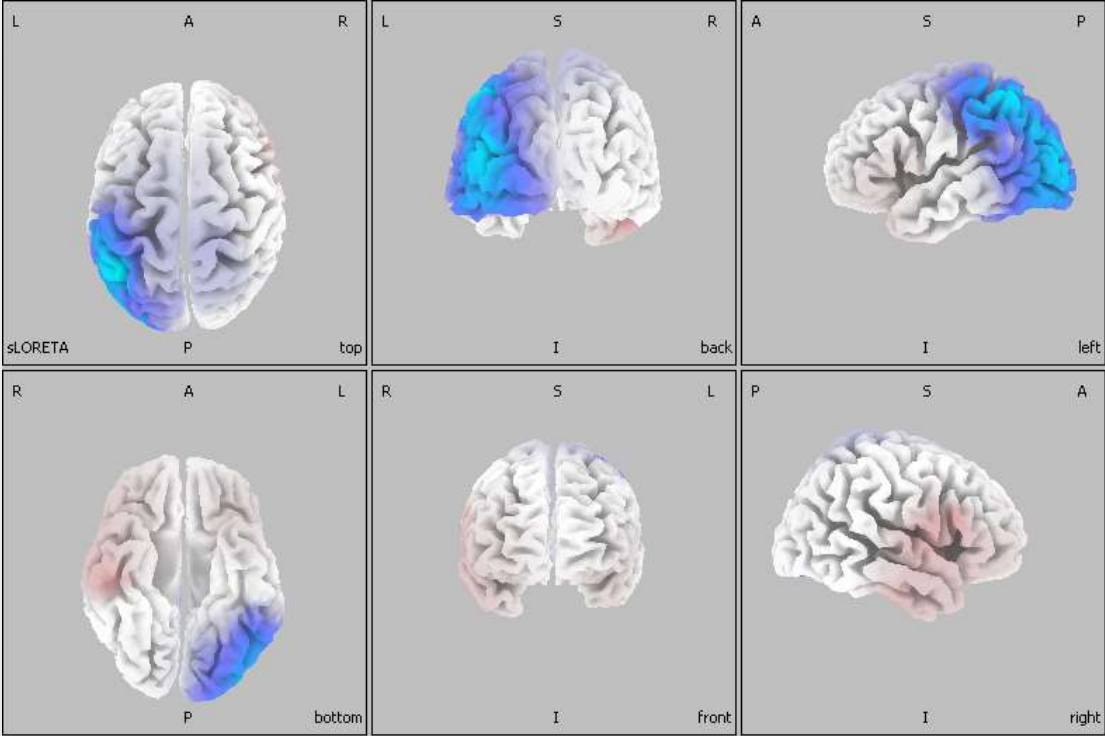
Left BA40, Inferior parietal lobule, Parietal lobe

BA40:

language perception

Patients: n= 19

Controls: n= 21



Acufene e disturbi emotivi: il ruolo del sistema limbico



- Esiste una sicura comorbidità con ansia e depressione
- Le caratteristiche dell'acufene (Loudness e Inibizione Residua) spesso non correlate con il grado di Distress (Annoyance)
- Is disability associated with depression? [Sullivan]



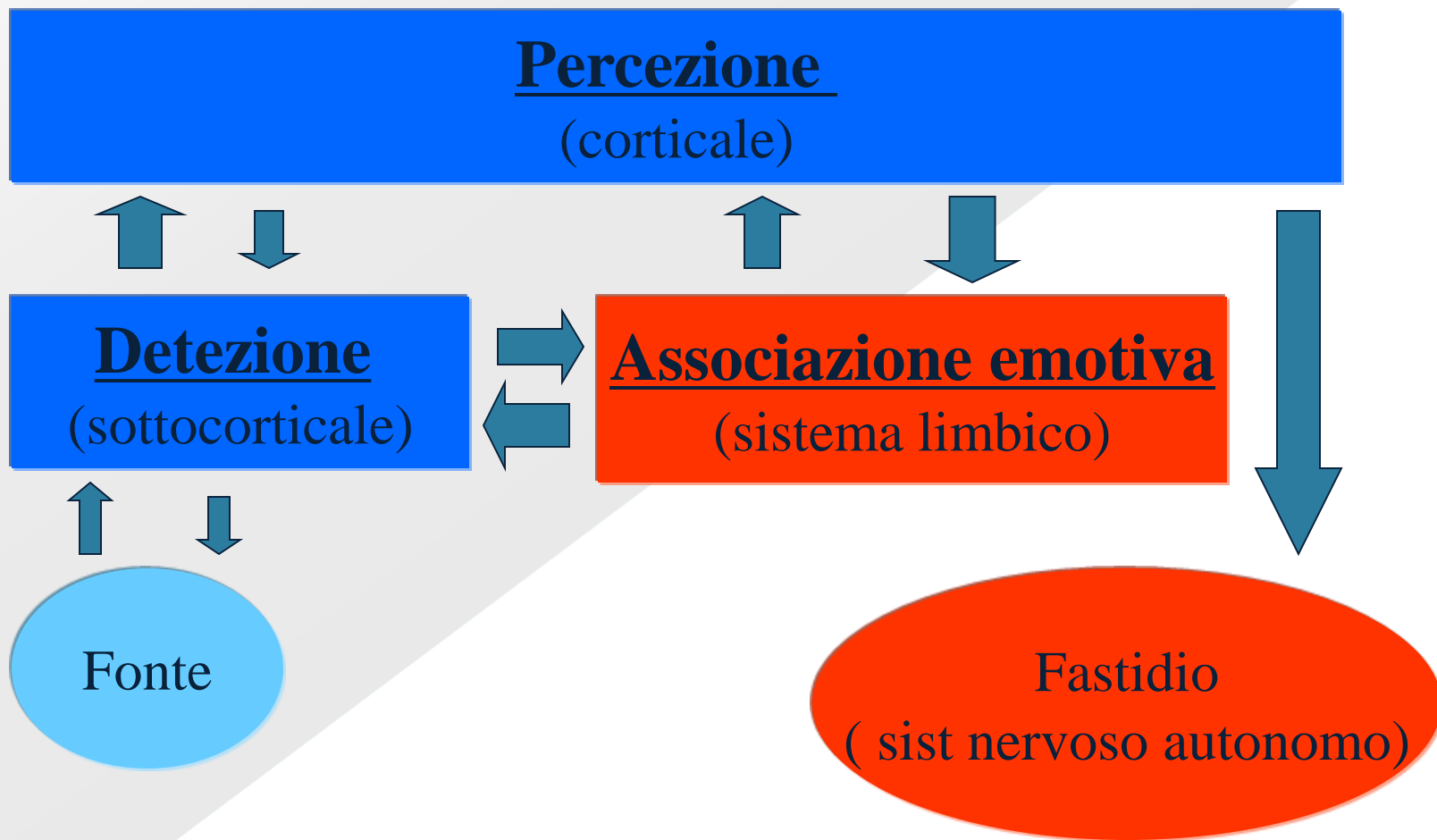
Udito e Sistema Limbico



L'udito, come tutti i sensi, è legato al sistema limbico: alcuni suoni provocano in noi **risposte affettive** che sono sempre funzionali a qualcosa. Pensiamo al pianto di un bimbo: quando il nostro udito percepisce un piccolo che piange, immediatamente l'adulto, in particolare se si tratta della madre, reagisce in modo congruo al richiamo.

Inoltre, alcuni stati affettivi possono rendere il nostro udito più sensibile ad alcuni suoni, per esempio gli stati ansiosi rendono l'udito più sensibile a tutti i suoni che richiamano ad un potenziale pericolo. **Le risposte automatiche sono sempre filtrate dal sistema limbico**, questo perché solitamente sono risposte a rumori che indicano pericolo o attivano i legami di attaccamento, entrambi elementi necessari alla sopravvivenza della specie.

Il "modello" di Jastreboff



Tinnitus Retraining Therapy (TRT)



Esami pre trattamento

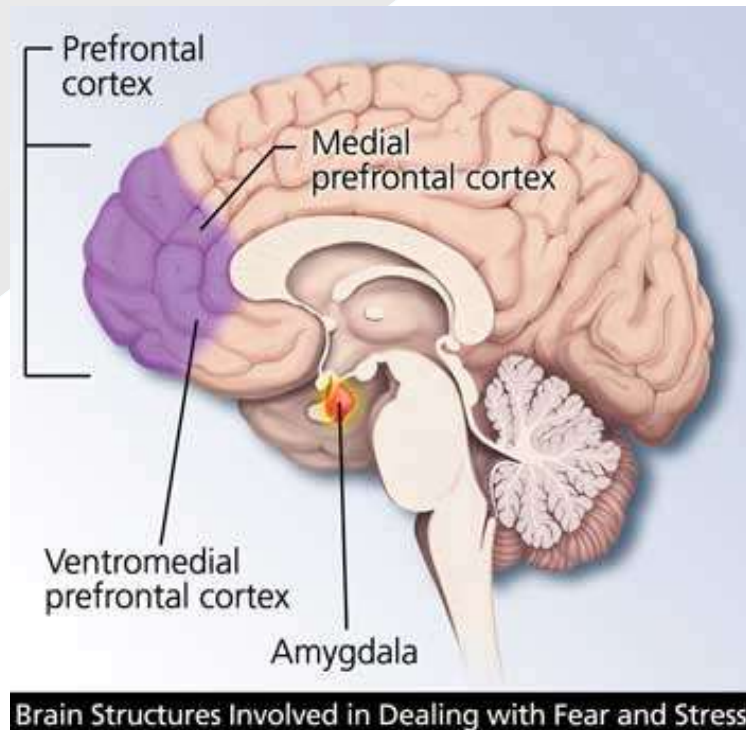


- Audiometria – Otoemissioni (DPOAE) -Impedenzometria
- Acufenometria
 - Pitch
 - Loudness (Sensation Level)
 - Livello Minimo di Mascherabilità (SL)
 - Inibizione Residua
 - Loudness Discomfort Level
- Questionari (Tinnitus Handicap Inventory)

Parametri da valutare



- Ipoacusia
- Iperacusia
- Reazione Emotiva



Tinnitus Retraining Therapy (TRT)



● Arricchimento Sonoro: NEUROMODULAZIONE

✓ Protesi "open fitting"



✓ Generatori di suono indossabili



✓ Generatori di suono ambientali



Mixing Point

Tinnitus Retraining Therapy (TRT)



- Counselling Cognitivo Comportamentale



- Terapia farmacologica per ansia e depressione

(SSR)

Tinnitus Retraining Therapy



Study	% benefit	Sample size
Jastreboff ^[47]	81	129
Sheldrake <i>et al.</i> ^[53]	84	483
Bartnik <i>et al.</i> ^[48]	80	556
Heitzman <i>et al.</i> ^[49]	84	58
Herraiz <i>et al.</i> ^[50]	88	172
Herraiz <i>et al.</i> ^[54]	82	158
Jastreboff and Jastreboff ^[51]	81	283
McKinney <i>et al.</i> ^[52]	83	36



Sound therapy (masking) in the management of tinnitus in adults

The limited data from the included studies failed to show strong evidence of the efficacy of sound therapy in tinnitus management. The absence of conclusive evidence should not be interpreted as evidence of lack of effectiveness. The lack of quality research in this area, in addition to the common use of combined approaches (hearing therapy plus counselling) in the management of tinnitus are, in part, responsible for the lack of conclusive evidence. Other combined forms of management, such as tinnitus retraining therapy, have been subject to a Cochrane Review. Optimal management may involve multiple strategies.

Controversy



- ✦ lack of scientific evidence from rigorously controlled randomized trials to support the efficacy of TRT and its components
- ✦ Wessex report: "There is clearly a need for properly controlled research trials into the effectiveness of retraining therapy."

Acufene pulsante e seno sigmoideo



CT characteristics of dehiscence sigmoid plates presenting as pulsatile tinnitus: a study of 23 patients

Wei Geng^{1*}, Zhaohui Liu^{2*} and Zhanming Fan³

Abstract

Background: Although some features of dehiscence sigmoid plates as a cause of pulsatile tinnitus (PT) have been reported, detailed imaging findings have not been evaluated.

Purpose: To retrospectively evaluate the computed tomography (CT) features of dehiscence sigmoid plates associated with PT.

Material and Methods: The CT images of 23 PT patients were assessed to evaluate the features of the dehiscence sigmoid plates, lateral sinuses, and temporal bone pneumatization.

Results: A total of 31 defects were found on the PT side. Twenty-five defects involved the superior curve or the descending segment, four involved above both sites, and only two involved the inferior curve. Twenty-six defects involved the anterior border or the anterolateral border, and only five involved the lateral border of the sigmoid sinus. The dehiscence sigmoid plate was on the dominant side in all 18 patients with a unilateral dominant lateral sinus, and on the right side in two patients and on the left side in three patients with co-dominant lateral sinuses. Fourteen patients had hyperpneumatization and nine had good pneumatization of temporal bone. Fifteen of the 17 patients with resolution of PT after surgery had a single defect. Four of the six patients with persistence of PT after surgery had more than one defect.

Conclusion: Sigmoid plate dehiscence often involves the anterior or anterolateral border of the superior curve or the descending segment of the sigmoid sinus on the side of the dominant lateral sinus, which often coexists with extensive pneumatization of the temporal bone.

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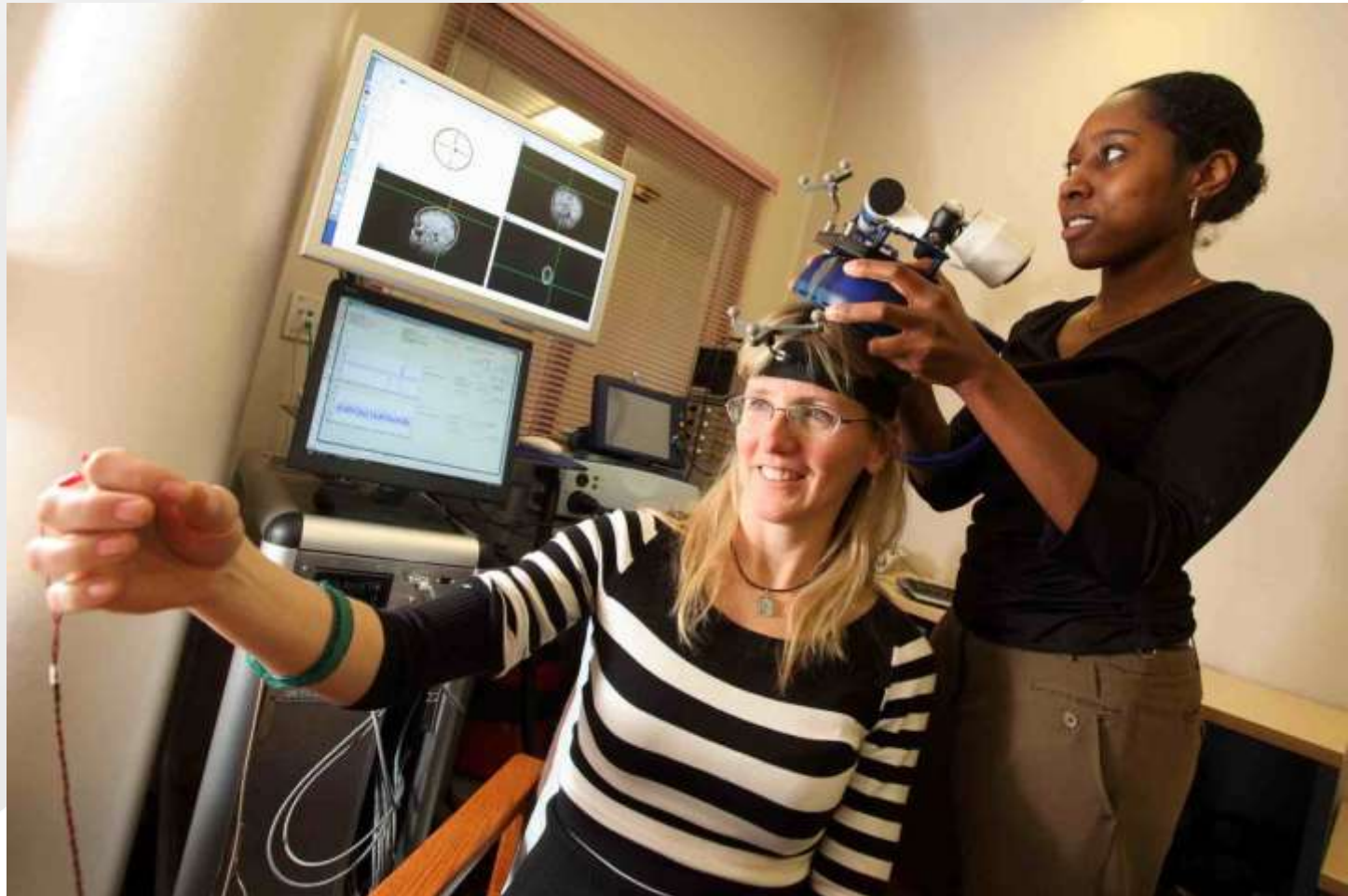
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Stimolazione Magnetica Transcranica Ripetuta



Guidelines

Evidence-based guidelines on the therapeutic use of repetitive transcranial magnetic stimulation (rTMS)



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A B S T R A C T

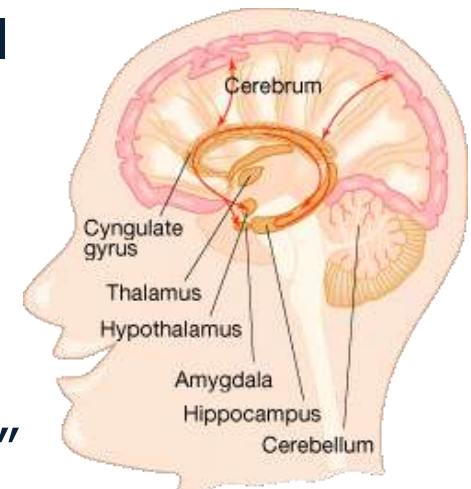
A group of European experts was commissioned to establish guidelines on the therapeutic use of repetitive transcranial magnetic stimulation (rTMS) from evidence published up until March 2014, regarding pain, movement disorders, stroke, amyotrophic lateral sclerosis, multiple sclerosis, epilepsy, consciousness disorders, tinnitus, depression, anxiety disorders, obsessive-compulsive disorder, schizophrenia, craving/addiction, and conversion. Despite unavoidable inhomogeneities, there is a sufficient body of evidence to accept with level A (definite efficacy) the analgesic effect of high-frequency (HF) rTMS of the primary motor cortex (M1) contralateral to the pain and the antidepressant effect of HF-rTMS of the left dorsolateral prefrontal cortex (DLPFC). A Level B recommendation (probable efficacy) is proposed for the antidepressant effect of low-frequency (LF) rTMS of the right DLPFC, HF-rTMS of the left DLPFC for the negative symptoms of schizophrenia, and LF-rTMS of contralesional M1 in chronic motor stroke. The effects of rTMS in a number of indications reach level C (possible efficacy), including LF-rTMS of the left temporoparietal cortex in tinnitus and auditory hallucinations. It remains to determine how to optimize rTMS protocols and techniques to give them relevance in routine clinical practice. In addition, professionals carrying out rTMS protocols should undergo rigorous training to ensure the quality of the technical realization, guarantee the proper care of patients, and maximize the chances of success. Under these conditions, the therapeutic use of rTMS should be able to develop in the coming years.

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Talamo e Sistema Limbico



- In studi su animale è stato dimostrato un circuito gabaergico a partenza dal talamo con attività inibente sui neuroni delle vie acustiche
- Tale circuito riceve fibre serotoninergiche dal restante sistema limbico con attività eccitatoria sul talamo.
- Riassumendo: maggiore attività limbica, maggiore inibizione delle vie acustiche, soprattutto delle attività elettriche "anomale"



The **noise cancellation system**? [Rauschecker]

Is it all a chemical factor?

Further studies are needed...

[I don't know!]

[Be positive, have a nice day]



HAVE A NICE WEEKEND!