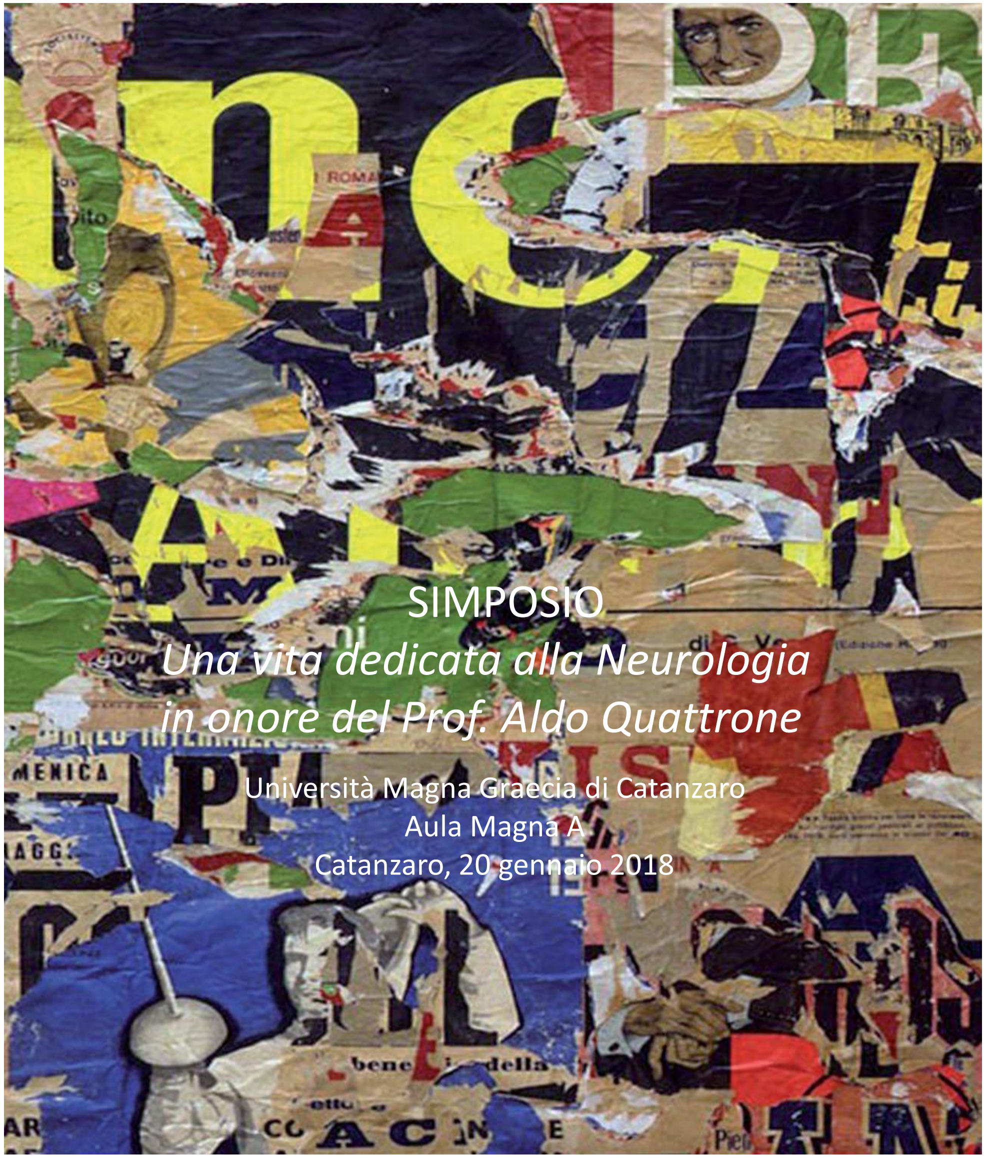
Consiglio Nazionale delle Ricerche
Istituto di Bioimmagini e Fisiologia Molecolare

UMG
Dubium sapientiae initium



RITA NISTICO'

"Approccio Neurofisiologico nella Malattia di Parkinson e Parkinsonismi"

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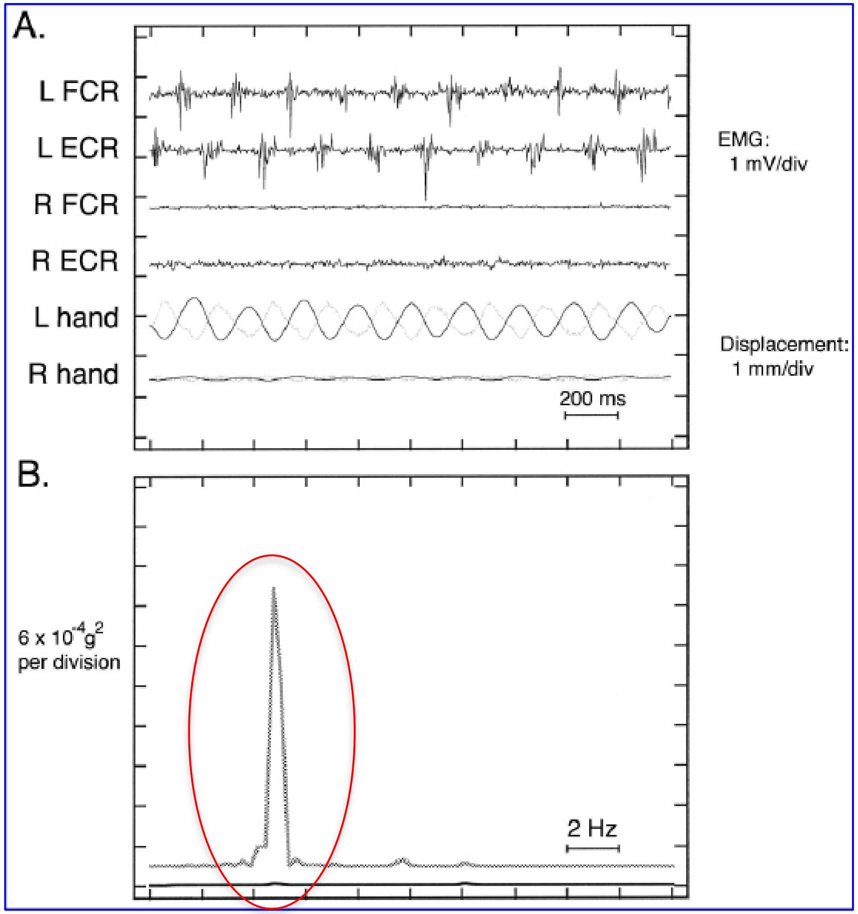
Tremor and Other Hyperkinetic Movements

Review

Tremor: Clinical Phenomenology and Assessment Techniques

Christopher W. Hess[1] & Seth L. Pullman[1*]

[1] Clinical Motor Physiology Laboratory, Department of Neurology, Columbia University Medical Center, New York, New York, United States of America



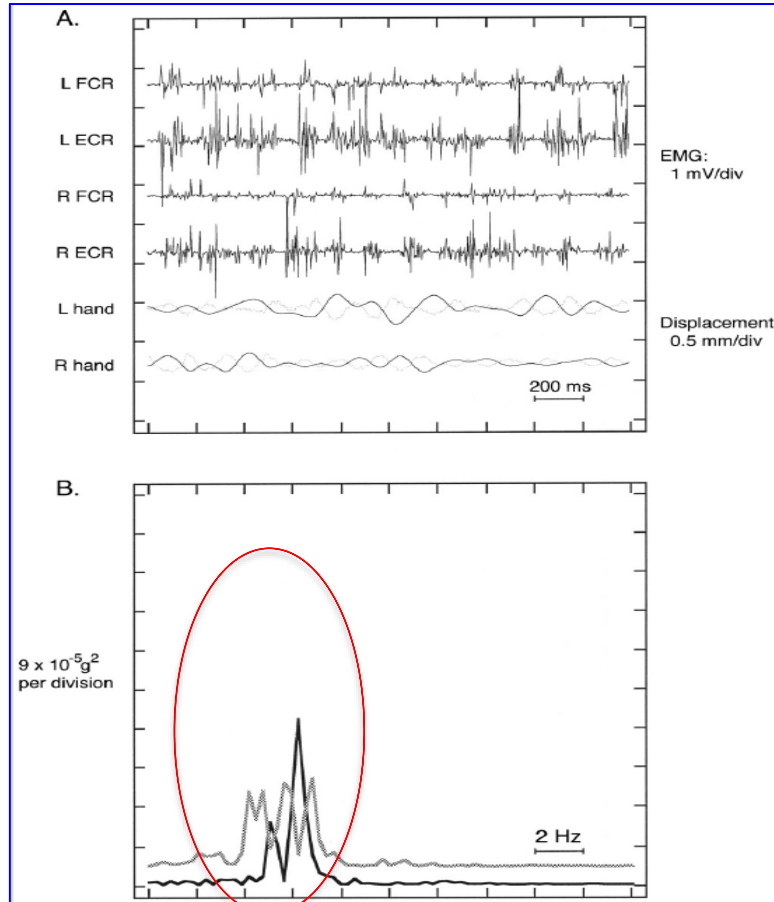
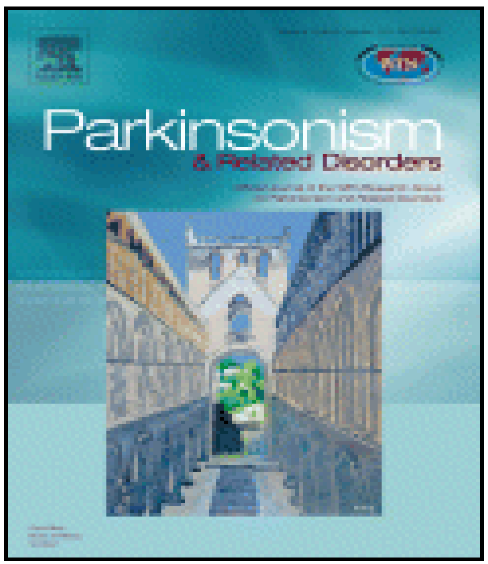


Table 1. Classification of Tremor Etiology Based on Circumstances of Occurrence

Etiology	Rest Tremor	Action Tremor		Notable Characteristics
		Postural	Kinetic	
Parkinsonism	+++	+	+	3–6 Hz, can re-emerge with posture (re-emergent tremor)
Midbrain (Holmes) tremor	++	+	+	Irregular and large amplitude, variable delayed onset, proximal as well as distal muscles involved
Thalamic tremor	++	++	++	Rare, sometimes delayed onset, can be associated with pain or sensory symptoms
Essential tremor	+	+++	+++	4–12 Hz, can occur at rest in longstanding disease, can have intentional component and be associated with mild ataxia or eye movement abnormalities
Cerebellar tremor		+	++	<5 Hz, predominantly intention tremor, uni- or bilateral, often associated with other cerebellar abnormalities such as dysmetria, overshoot, and past-pointing
Exaggerated physiologic tremor		++	++	Non-pathological; generally between 6 and 12 Hz, can result from anxiety or stress, fatigue, hypothermia, hypoglycemia, or metabolic disorders such as hyperthyroidism
Drug-induced tremor		++	++	Non-progressive, usually symmetric, often has a dose-response relationship with the causative drug and/or is temporally related with drug onset
Orthostatic tremor		+++		>13 Hz, occurs with weight bearing or isometric muscle contraction, variable latent period
Dystonic tremor	+	++	++	Usually <7 Hz or jerky and rhythmic irregular with variable amplitude, accompanied by abnormal (sometimes subtle) posturing, often having a null point and/or "sensory trick"
Neuropathic tremor	+	+	++	3–6 Hz, predominantly affecting more distal muscles, often irregular with variable amplitude, usually accompanied by symptoms of neuropathy
Task-specific (e.g., writing tremor)		+	+++	4–8 Hz, occurring predominantly with a specific task or posture, most common form is primary writing tremor

Synchronous pattern distinguishes resting tremor associated with essential tremor from rest tremor of Parkinson's disease

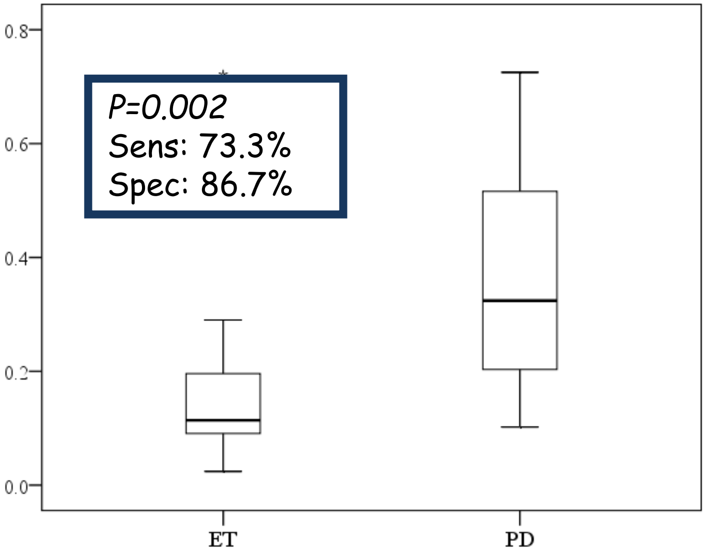


R. Nisticò, MD[a], D. Pirritano, MD[b], M. Salsone, MD[b], F. Novellino, MD[b], F. Del Giudice, MD[b], M. Morelli, MD[b], M.Trotta, MD[b], G. Bilotti, MD[b], F. Condino, PhD[c], A. Cherubini, PhD[a], P. Valentino, MD[b] and A. Quattrone, MD[a,b]

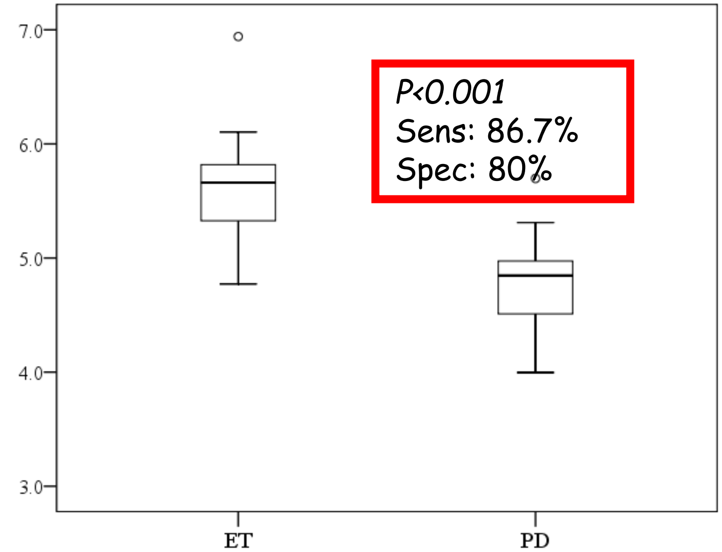
[a] Neuroimaging Research Unit, National Research Council, Catanzaro
[b] Institute of Neurology, University Magna Græcia, Catanzaro
[c] Institute of Neurological Sciences, National Research Council, Cosenza

2011

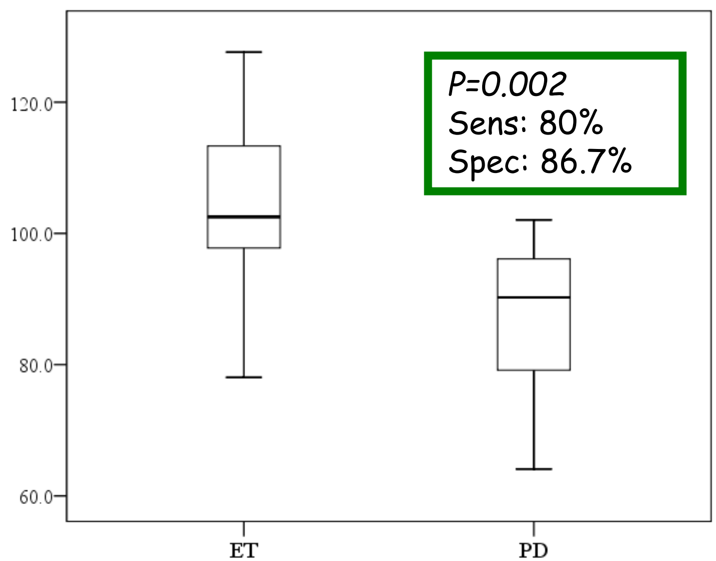
AMPIEZZA [mV]



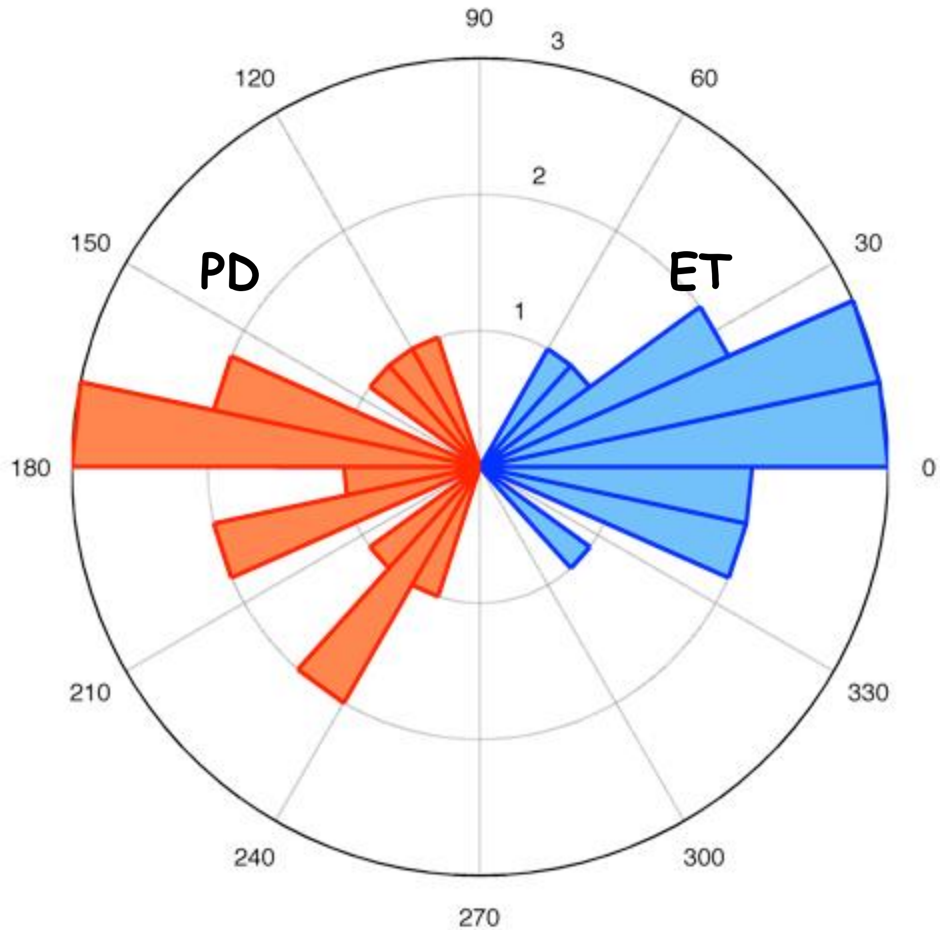
FREQUENZA[Hz]



DURATA BURST [ms]



PATTERN



P<0.001
Sens: 100%
Spec: 100%

Parkinsonism and Related Disorders 25 (2016) 100–103

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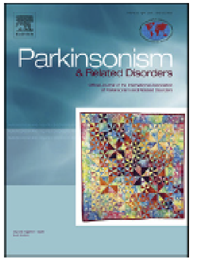


Short communication

Tremor pattern differentiates drug-induced resting tremor from Parkinson disease

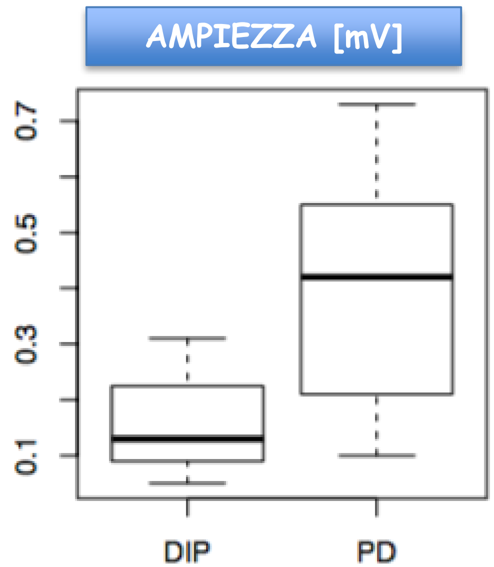
R. Nisticò [a], A. Fratto [b], B. Vescio [a], G. Arabia [a, b], G. Sciacca [c], M. Morelli [a, b], A. Labate [a, b], M. Salsone [a], F. Novellino [a], A. Nicoletti [c], A. Petralia [d], A. Gambardella [a, b], M. Zappia [c], A. Quattrone [a, b, *]

[a] *Neuroimaging Research Unit, Institute of Bioimaging and Molecular Physiology, National Research Council, Germaneto, Catanzaro, Italy*
[b] *Institute of Neurology, Department of Medical Sciences, University Magna Graecia, Catanzaro, Italy*
[c] *Department of Medical and Surgical Sciences and Advanced Technologies "G.F. Ingrassia" University of Catania, Italy*
[d] *Department of Clinical and Experimental Medicine, University of Catania, Italy*

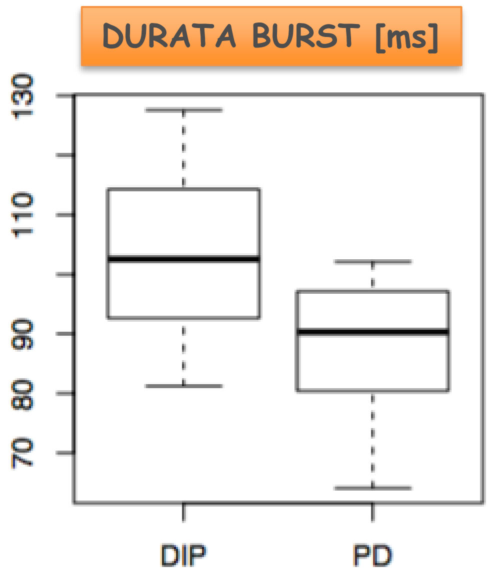
Caratteristiche demografiche/cliniche

No.	Drug	Age	Sex	Onset	Duration	Initial UPDRS-ME	F/U UPDRS-ME
1	AMILSULPIRIDE	70	F	69	1	15	-
2	OLANZAPINE	75	F	72	13	37	-
3	FLUNARIZINE	61	F	59	2	14	10
4	PERFENAZINE	79	F	76	3	13	-
5	VALPROIC ACID	80	M	67	12	52	-
6	VALPROIC ACID	76	F	71	6	19	-
7	AMISULPIRIDE	80	F	70	10	36	-
8	FLUNARIZINE	77	F	69	9	18	-
9	VALPROIC ACID	75	F	65	10	19	-
10	VALPROIC ACID	47	F	45	2	11	8
11	VALPROIC ACID	58	F	54	3	10	8
12	VALPROIC ACID	64	F	54	10	12	6
13	OLANZAPINE	66	M	64	2	21	-
14	VALPROIC ACID	78	F	76	2	30	-
15	VALPROIC ACID	61	M	63	2	10	-
16	VALPROIC ACID	54	F	53	1	15	-

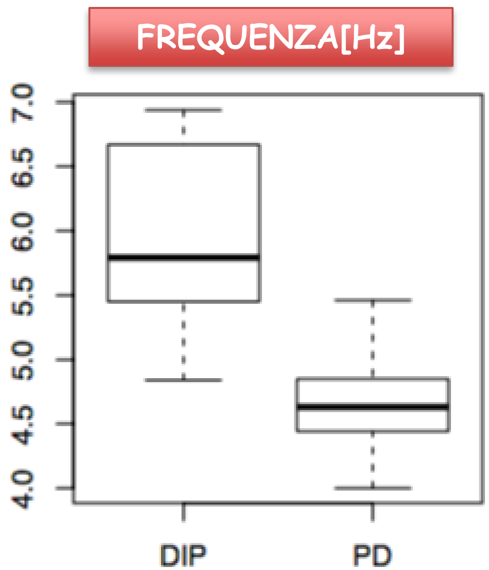
Parametri elettrofisiologici



Sens: 66,7%
Spec: 100%
Acc: 83,3%

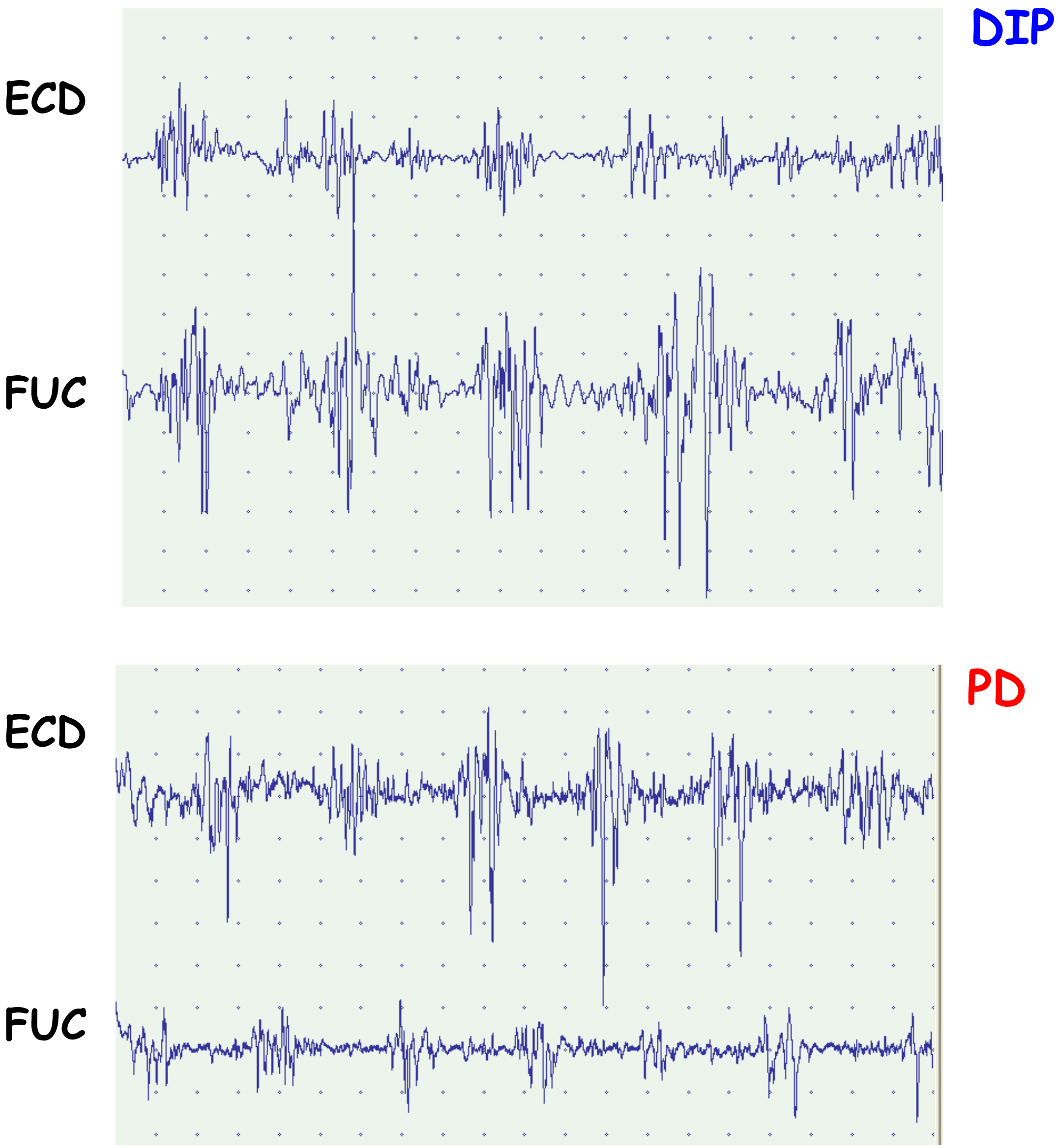


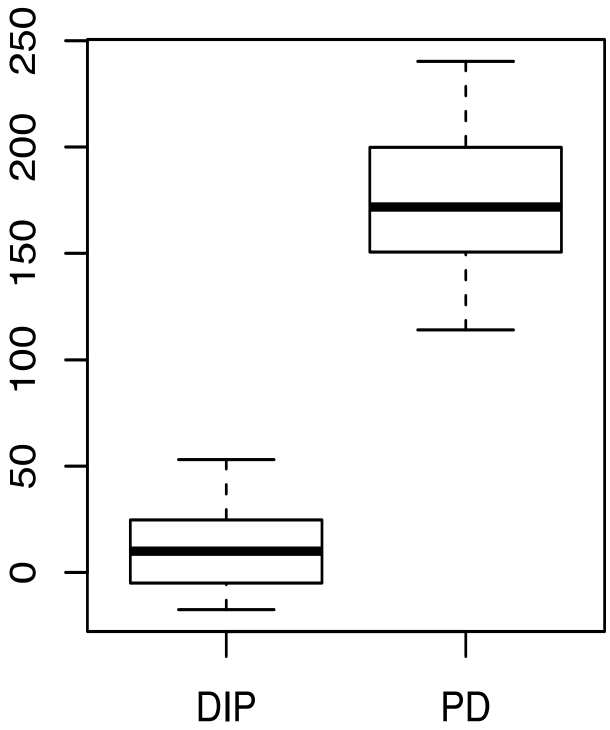
Sens: 55,5%
Spec: 100%
Acc: 77,8



Sens: 83,3%
Spec: 83,3%
Acc: 83,3%

Pattern del tremore a riposo



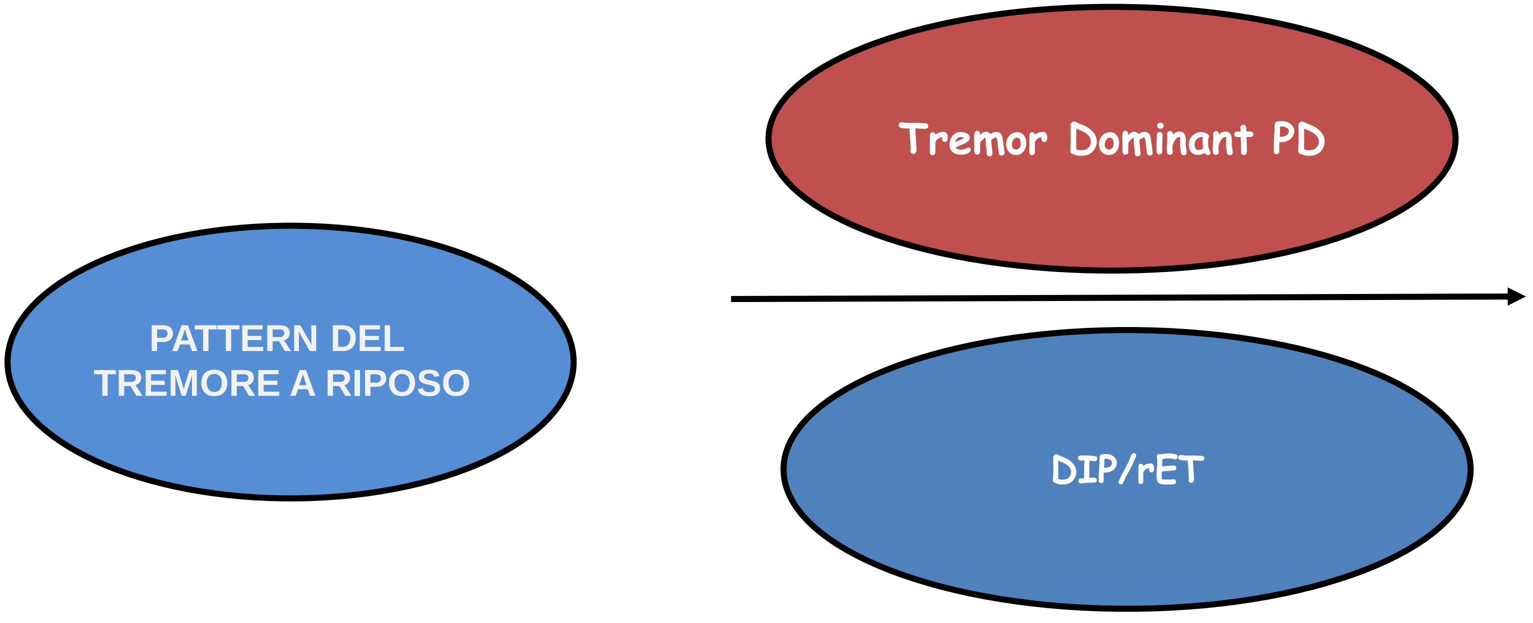


P<0.001
Sens: 100%
Spec: 100%
Acc: 100%

Pazienti con DIP e rET possono essere confusi con PD, poiché i segni clinici di queste due patologie sono spesso indistinguibili.

DAT-SPECT metodica utile nella diagnosi differenziale tra PD e forme di tremore senza danno dopaminergico.

Studio elettrofisiologico può essere uno strumento utile nel differenziare PD da rET e DIP.



Clinical/Scientific Notes

R. Nisticò, MD*
D. Pirritano, MD*
M. Salsone, MD
P. Valentino, MD
F. Novellino, MD
F. Condino, PhD
F. Bono, MD
A. Quattrone, MD

BLINK REFLEX RECOVERY CYCLE IN PATIENTS WITH DYSTONIC TREMOR: A CROSS-SECTIONAL STUDY

Dystonic tremor (DT) is defined as a postural/kinetic tremor with irregular amplitude and variable frequency occurring in an extremity or body part affected by dystonia.[1]

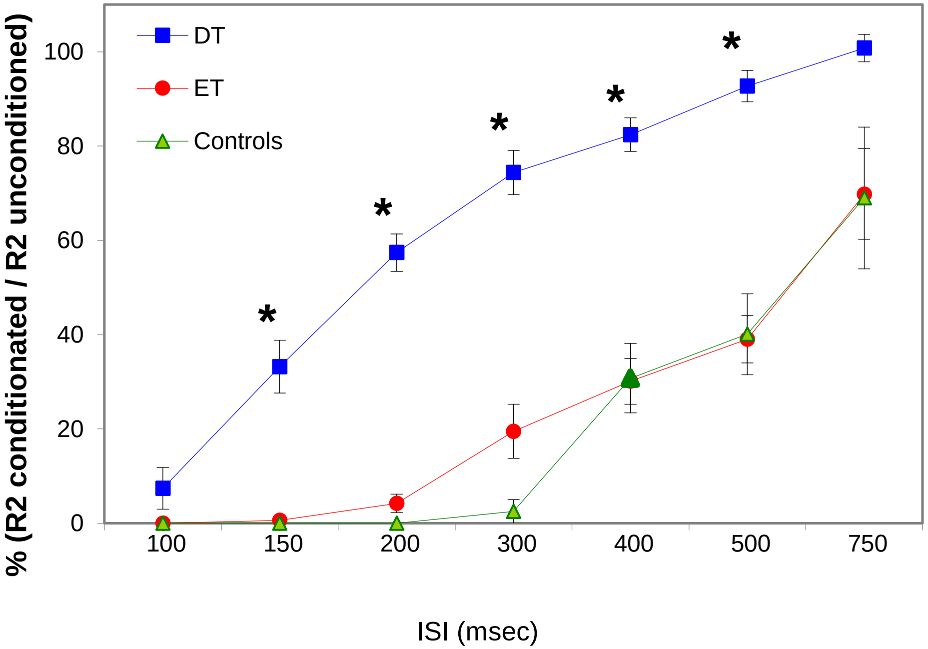
Diagnosing this disorder may be challenging because tremor observed in patients suspected of having DT resembles essential tremor (ET), and dystonia may be subtle and difficult to recognize only

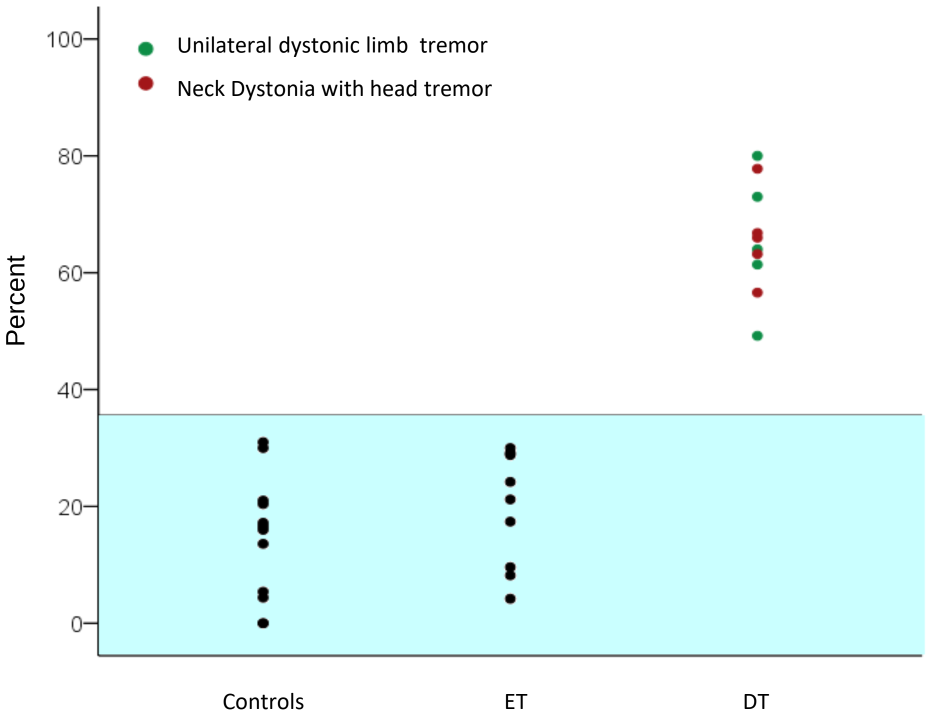
formed consent was obtained from all participants, and the study was approved by the institutional review board.

Results. Clinical characteristics of DT and ET patients are shown in table e-1 on the *Neurology*® Web site at www.neurology.org. There were no differences between right and left sides. R2 area ratio was significantly enhanced in DT patients from ISI 150, 200, 300, 400, and 500 compared to ET and controls

2012 Apr 24;78(17):1363-5

Indice di recupero della componente R2





* **Differenze statisticamente significative**

p **<0.001**

Sens: 100%

Spec: 100%

35.60%

Blink reflex recovery cycle in patients with essential tremor associated with resting tremor

Rita Nisticò, MD*
Domenico Pirritano, MD*
Fabiana Novellino, MD
Maria Salsone, MD
Maurizio Morelli, MD
Paola Valentino, MD
Francesca Condino, PhD
Gennarina Arabia, MD
Aldo Quattrone, MD

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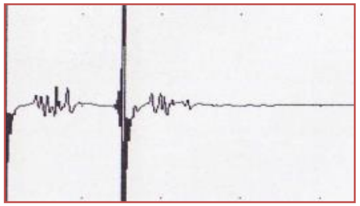
ABSTRACT

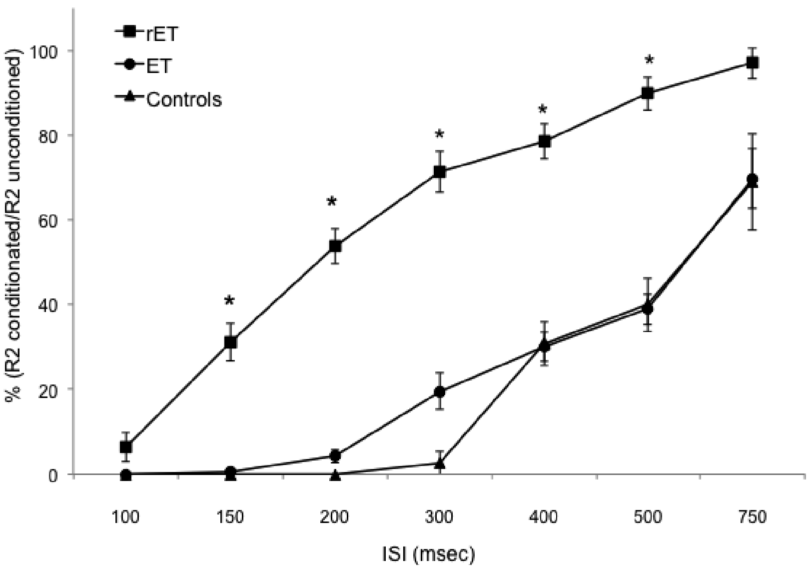
Objective: An increased R2 recovery component of the blink reflex (R2-BRrc) has been commonly observed in Parkinson disease, cranio-cervical dystonia, and dystonic tremor, while the BRrc was reported normal in patients with essential tremor (ET). We studied BRrc in patients with ET associated with resting tremor (rET) in comparison with patients with ET.

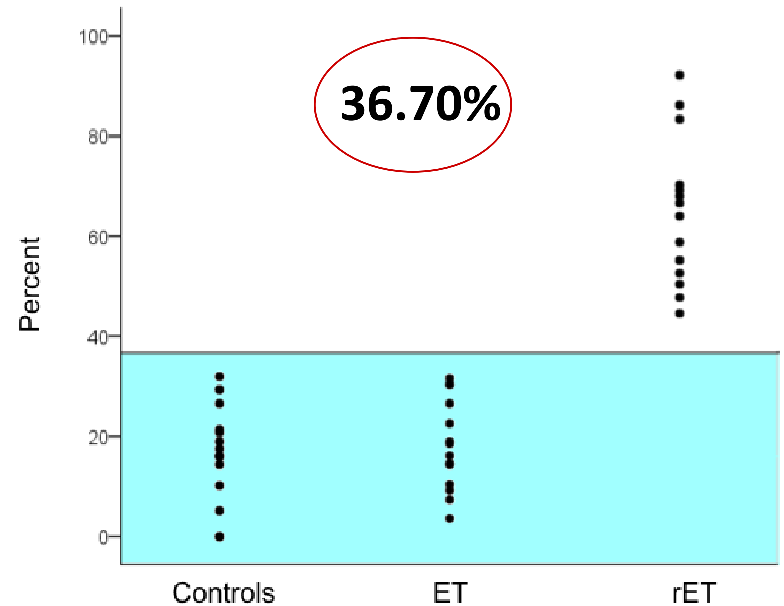
Methods: This was a cross-sectional study investigating R2-BRrc at interstimulus intervals (ISI) of 100, 150, 200, 300, 400, 500, and 750 msec in 14 patients with rET, 14 patients with ET, and 16 healthy controls. To compare individual patients, we calculated an R2 recovery index in each subject as the mean of R2 area ratio values at ISIs of 150, 200, 300, 400, and 500 msec. All patients and controls underwent DAT-SPECT.

Results: Patients with rET differed from those with ET for the presence of resting tremor associated in several cases (36%) with a subtle arm dystonia. DAT-SPECT was normal in all patients and controls. All patients with rET (with and without dystonia) had an increased R2-BRrc while all patients with ET had a normal BRrc comparable to that of control subjects. The R2 recovery index was abnormal in all patients with rET but in none of the patients with ET.

Conclusions: Patients with rET showed increased R2-BRrc, suggesting that this form of tremor may be a dystonic tremor rather than a subtype of ET. BRrc helps to correctly diagnose DAT-negative patients with resting tremor also in the absence of overt dystonic posturing. *Neurology*® 2012;79:1490–1495







*** Differenze statisticamente significative**

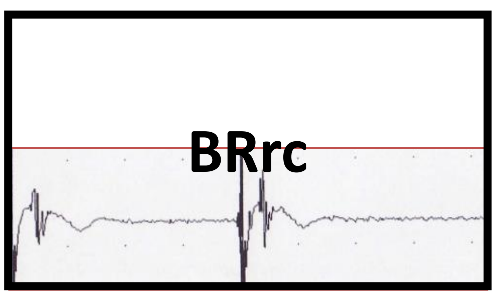
***p* <0.001**

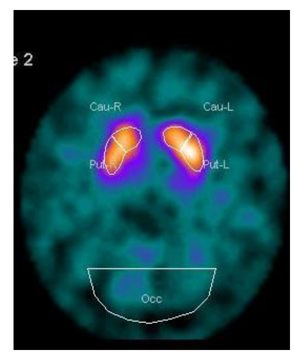
Sens: 100%

Spec: 100%

TREMORE ESSENZIALE con TREMORE DI RIPOSO

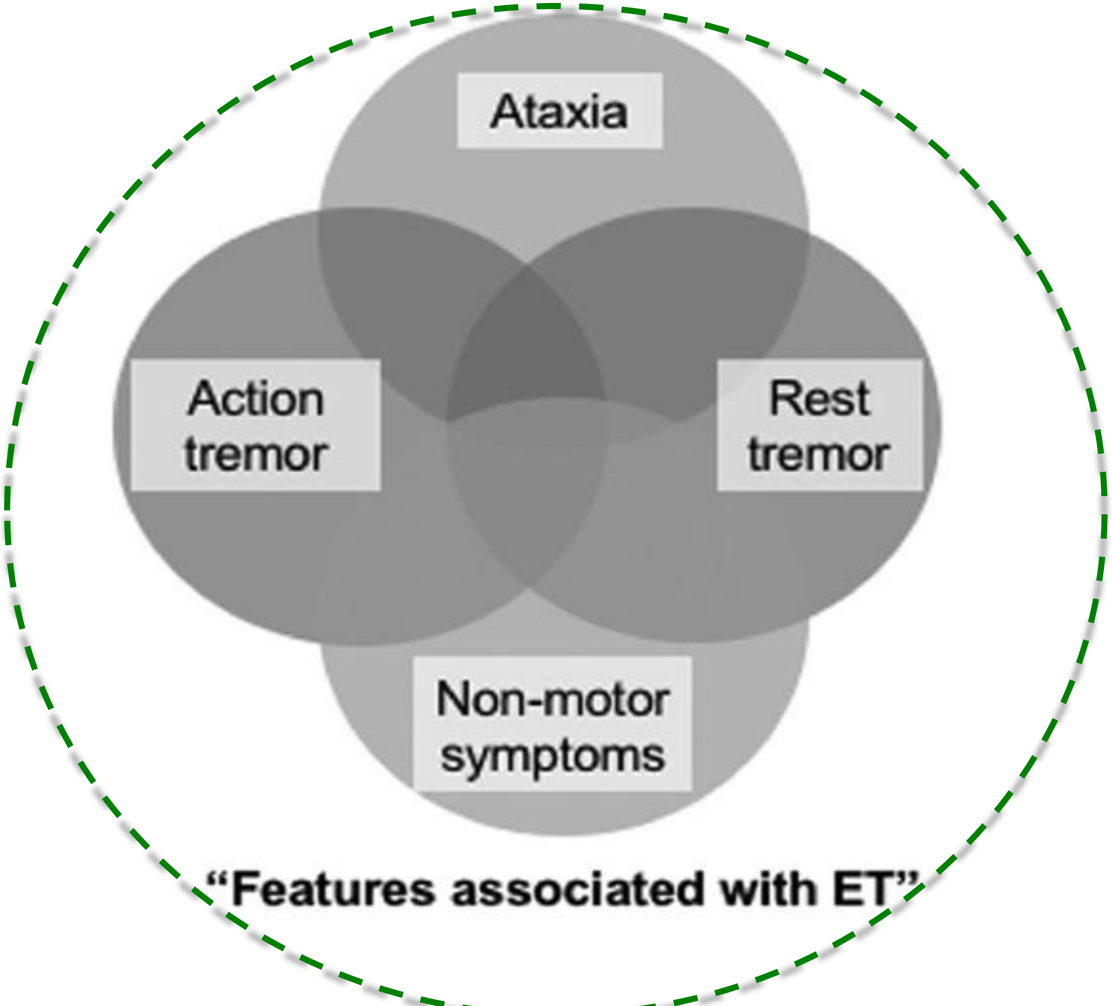
TREMORE ESSENZIALE





DAT-NEGATIVO

Essential tremor (ET) has been viewed as a single but heterogeneous disorder



K. P. Bhatia et al. Movement Disorders 2017

Parkinsonism and Related Disorders xxx (2013) 1–4

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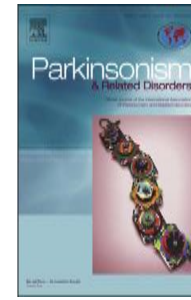
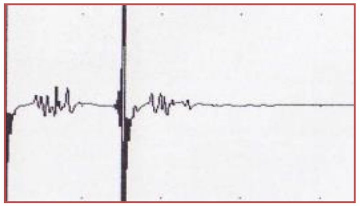


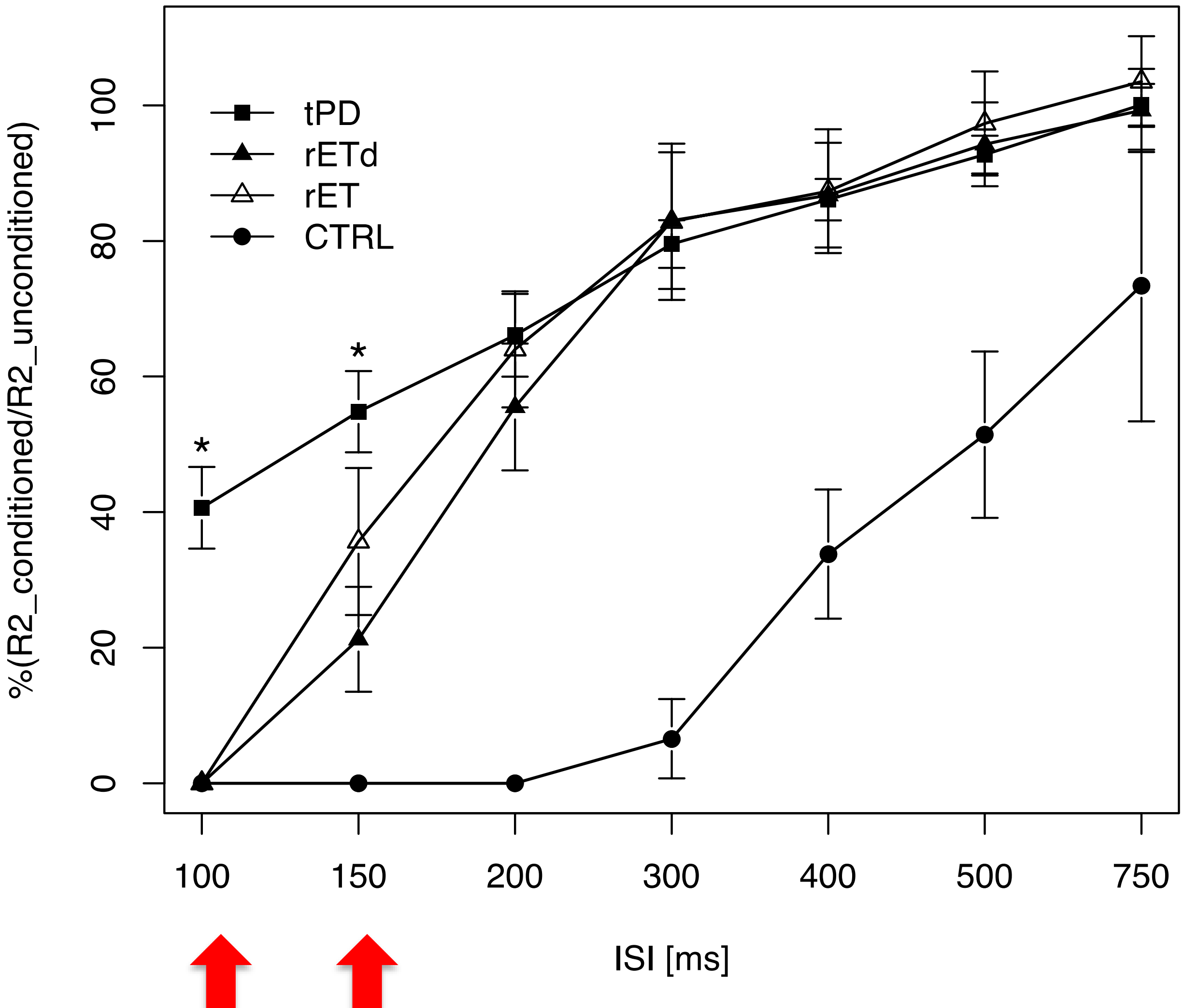
Blink reflex recovery cycle distinguishes essential tremor with resting tremor from de novo Parkinson's disease: An exploratory study

R. Nisticò [b], M. Salsone [a], B. Vescio [b], M. Morelli [a], M. Trotta [a], G. Barbagallo [a], G. Arabia [a], A. Quattrone [a,b,*]

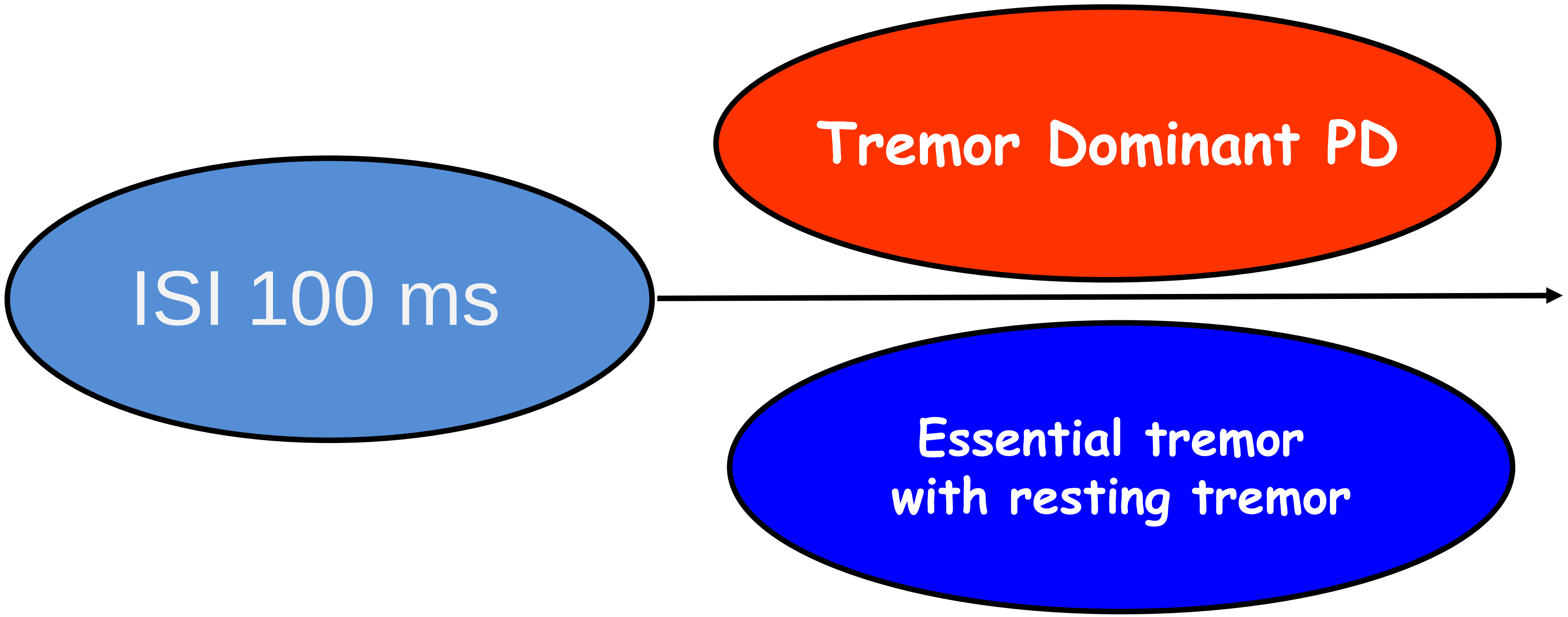
[a] The Institute of Neurology, Department of Medical Sciences, University Magna Graecia, Campus Universitario Germaneto, Viale Europa, Catanzaro 88100, Italy
[b] Neuroimaging Research Unit, Catanzaro, Italy



RISULTATI BRrc



Blink Reflex recovery cycle



Il ciclo di recupero del blink reflex può essere uno strumento utile nel differenziare tPD da rET.

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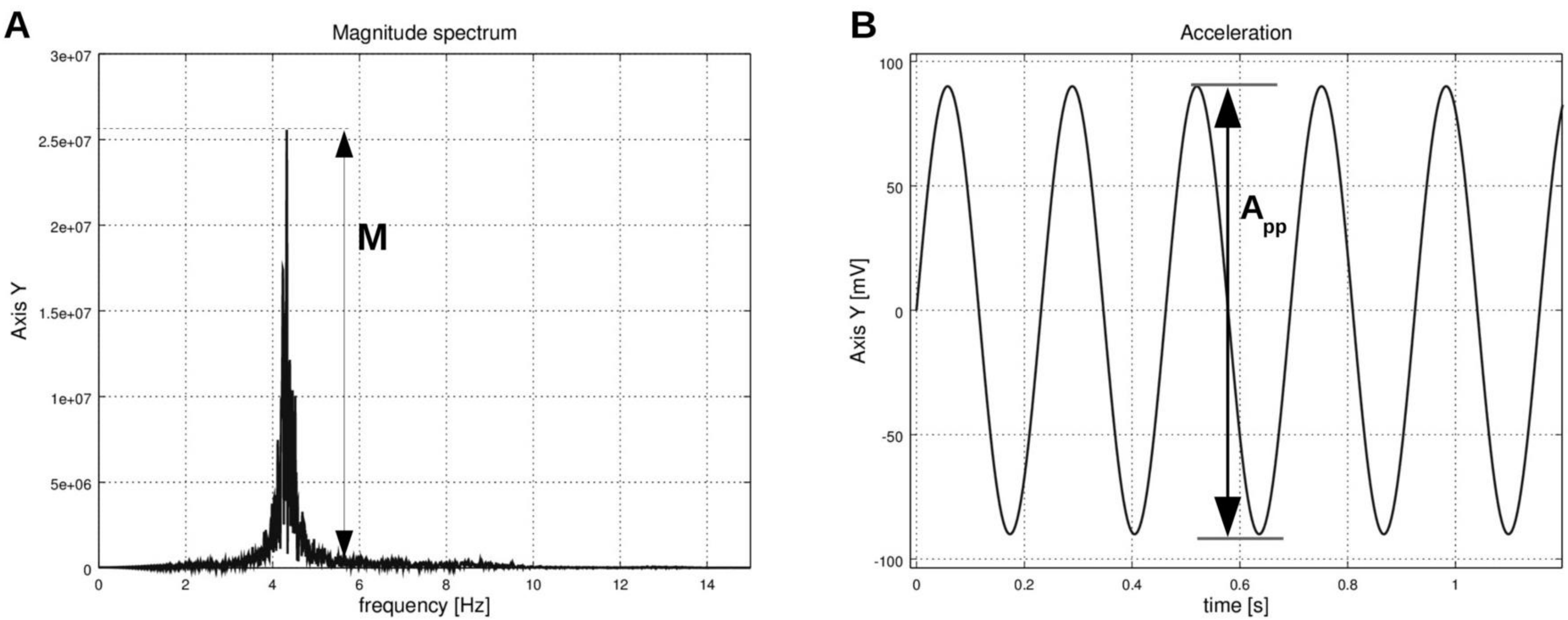
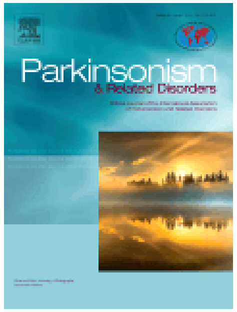
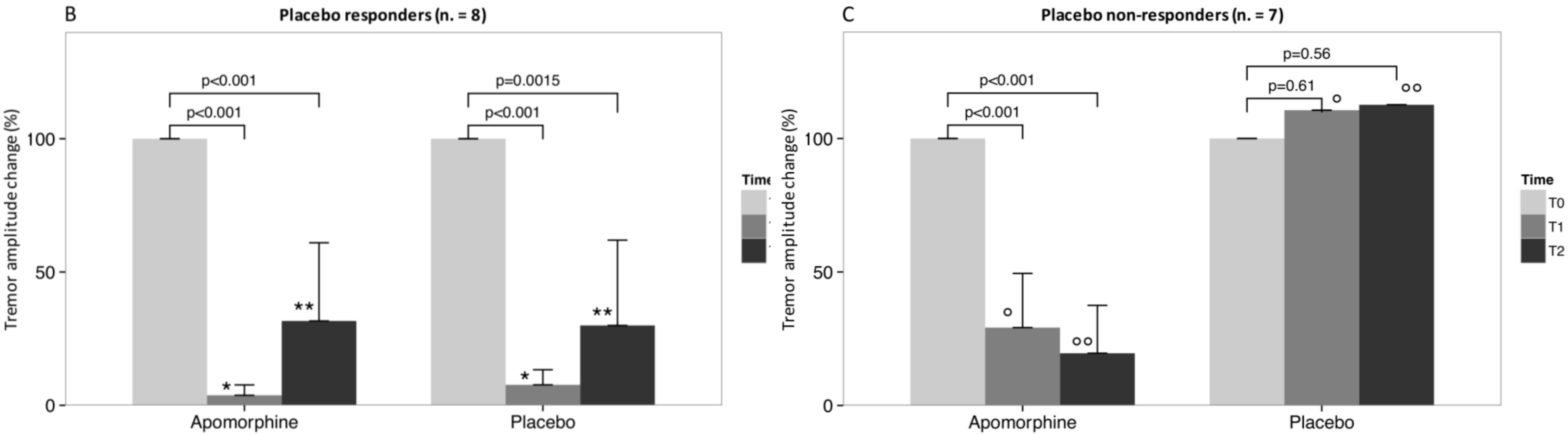
The placebo effect on resting tremor in Parkinson's disease: an electrophysiological study.

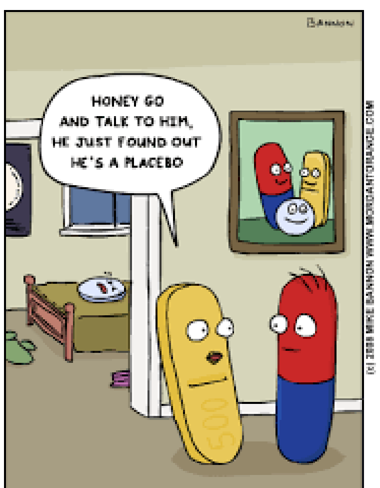


Quattrone et al., 2018 submitted



The placebo effect on resting tremor in Parkinson's disease: an electrophysiological study.





Quattrone et al., 2018 submitted

“Le cose vere della vita non si studiano né si imparano, ma si incontrano”

Oscar Wilde