Cognitive evaluation in isolated REM sleep behavior disorder

L. Sambati, L. Baldelli, G. Calandra Buonaura, P. Guaraldi, P. Cortelli and F. Provini

IRCCS, Istituto delle Scienze Neurologiche di Bologna,
Dipartimento di Scienze Biomediche e NeuroMotorie (DIBINEM), Università di Bologna, Bologna, Italy

Introduction

Rapid eye movement (REM) sleep Behavior Disorder (RBD), a REM sleep parasomnia characterized by loss of the physiological muscle atonia during REM sleep and dream enacting behavior [AASM, 2014].
isolated RBD (iRBD) has been related to poorer cognitive performances on neuropsychological tests in comparison with controls and to higher frequency of mild cognitive impairment (MCI). Impairment in executive functions and attention, verbal episodic memory, and visuospatial abilities has been described towards the development of a full-blown dementia (with Lewy Bodies, DLB).

Objective

of this work is to assess cognitive functions, describe the frequency of cognitive impairment and the cognitive profile in a group of patients with iRBD and their longitudinal progression in relation to other neurological signs (autonomic dysfunction, sleep alterations or odor identification impairment).

Materials

We enrolled all consecutive patients with a diagnosis of isolated RBD referred from April 2015 up to December 2019 to the IRCCS Istituto delle Scienze Neurologiche di Bologna and to the Department of BIoMedical and NEuroMotor Sciences, University of Bologna.
•The patients met the international diagnostic criteria for RBD, consisting of either polysomnography (PSG) documented episodes of sleep related vocalizations and/or complex motor behaviors during REM sleep, or history of dream enactment plus PSG documentation of tonic chin muscle activity during REM sleep or excessive phasic muscle activity during rem sleep . [AASM, 2014].
•Each subject underwent evaluation of cognitive performances through validated neuropsychological tests. Additionally, the participants underwent neurological examination, autonomic and odor tests and questionnaires for non-motor symptoms.
•RBD was defined as isolated (iRBD) after a complete interview and neurological and cognitive examinations conducted by two neurologists who verified the absence of definite criteria for parkinsonism [Hughes et al., 1992] and of early dementia.
•All procedures were performed at baseline (T0), and annually from baseline. The controls underwent the same evaluations.

Conclusions

Our results suggest a continuum from HC to CI iRBDs, with sparing of language and impairment of visuospatial function. During progression verbal memory and executive functions get worse in the MCI stage, eventually deteriorating toward dementia.
Moreover, to our knowledge, this is the first study evaluating the difference in autonomic dysfunctions and sleep disturbances in iRBD patients with and without cognitive impairment, disclosing no differences of cardiovascular autonomic regulation and sleep macrostructure between these groups.

Bibliogaphy:
1. Postuma, R.B., et al., Risk and predictors of dementia and parkinsonism in idiopathic REM sleep behaviour disorder: a multicentre study. Brain, 2019. 142(3): p. 744-759.
2. Terzaghi M., et al., Assessment of cognitive profile as a prodromal marker of the evolution of REM sleep Behavior Disorder. Sleep. 2019 1;42(8).

Clinical history	age at onset of RBD RBD disease duration interval from first symptom onset to death or last visit
Neurological examination	Parkinsonian (MDS-UPDRS-III) *[Goetz et al., 2008]* Cerebellar and pyramidal Cognitive (Non-Motor Symptoms Questionnaire) *[Romenets et al., 2012]*
Questionnaires	Sleep, autonomic and quality of life questionnaires
Video-polysomnographic study	obstructive sleep apnoea syndrome (OSAS) stridor
Cardiovascular reflex test	neurogenic orthostatic hypotension (OH)
Odor identification test	Sniffing Test

Cognitive function	Test	Cut-off	References
Global cognition	Mini-Mental State Examination (MMSE)	> 23,8	Measso et al 1993
	Brief Mental Deterioration Battery (BMDB)	≥ 0	Gallassi et al 1986, 2008
Memory	Rey's 15 words: immediate recall (RAVLT IR)	≥ 28,53	Carlesimo et al 1996
	Rey's 15 words: delayed recall (RAVLT DR)	≥ 4,69	Carlesimo et al 1996
	Immediate visual memory (IR)	≥ 13,85	Carlesimo et al 1996
Attention	Barrage test	≤ 2,5	Gallassi et al 1986, 2008
	Stroop test	time ≤ 27,5 errors ≤ 7,5	Cafarra et al 2002
Executive Functioning	Simple Verbal Analogies Test (SVAT)	>13,92	Gallassi et al 2014
Language	Verbal Phonemic Fluency (FV)	≥ 17,35	Carlesimo et al 1996
	Verbal Semantic Fluency (FS)	≥ 25	Novelli et al 1986
Visuospatial and constructive function	Simple Copy Drawing (CD)	≥ 7,18	Carlesimo et al 1996
Depression	Beck Depression Inventory (BDI)	< 14	Beck et al 1961
Anxiety	State Trait Anxiety Inventory (STAI-Y)	STAI t < 50	Spielberger et al 1980
Apathy	Apathy Scale	>45	Starkstein et al 1992
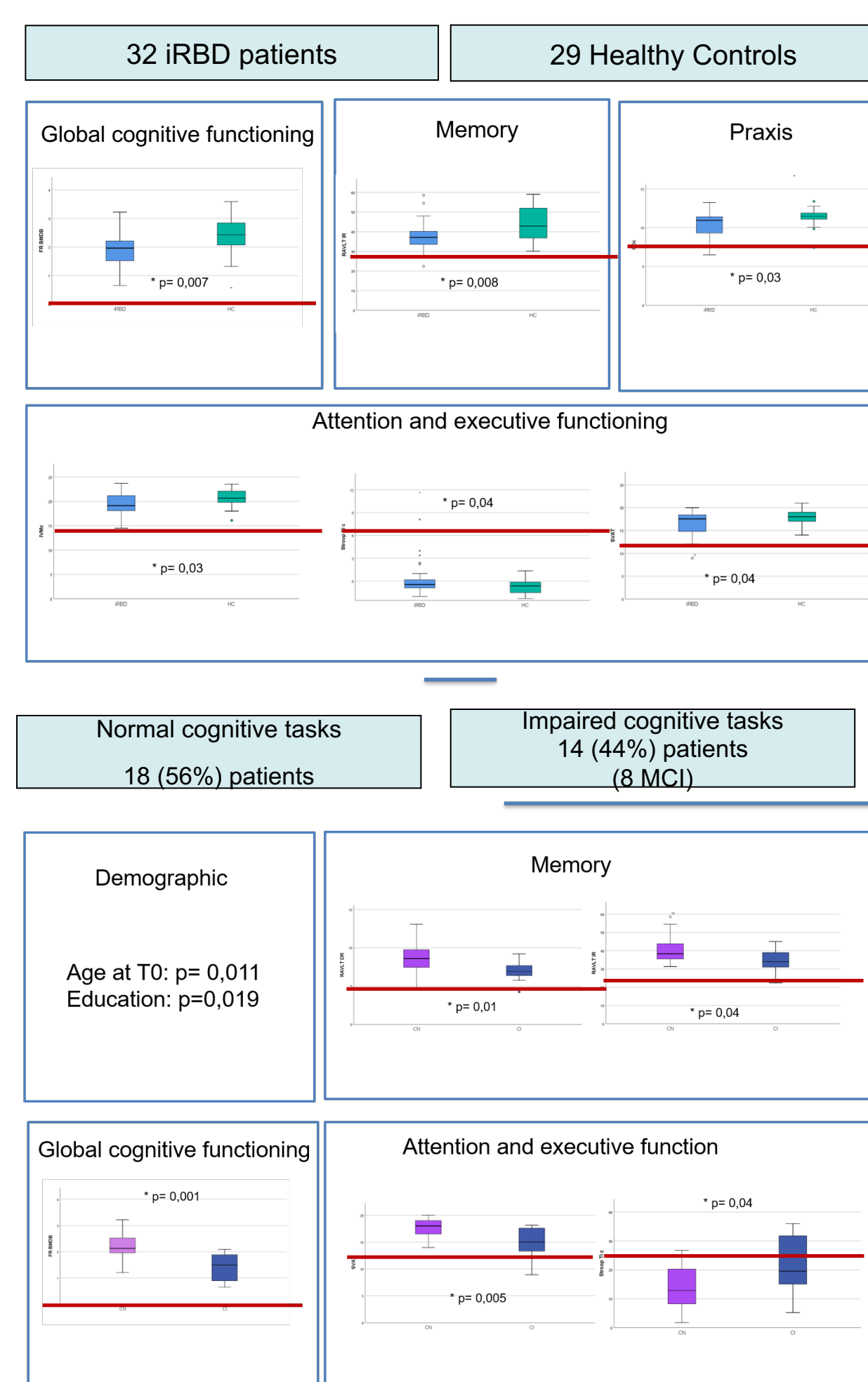
All test results were corrected for age, sex and education according to Italian standardizations.
In order to avoid practice effect, we used parallel form in two subsequent evaluation.
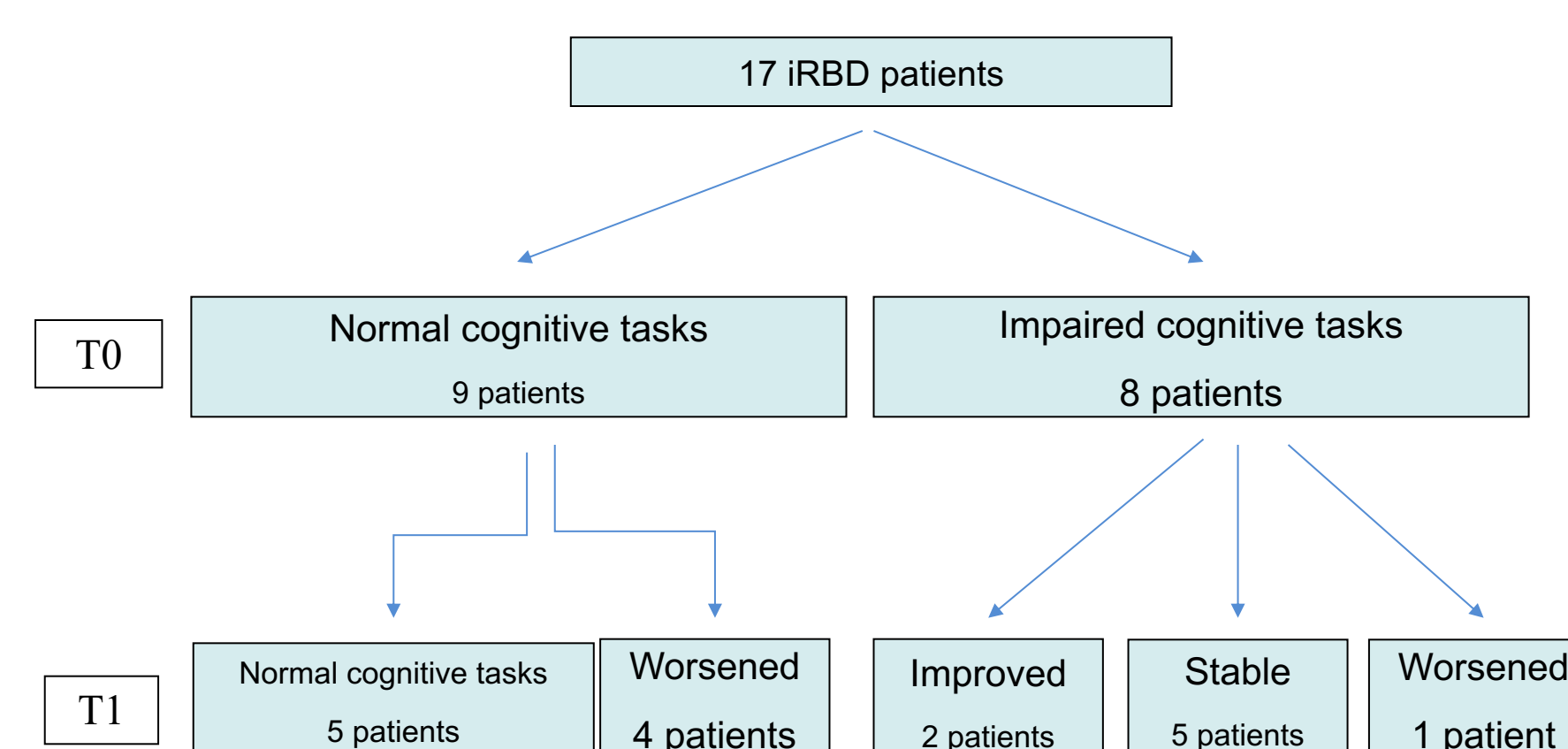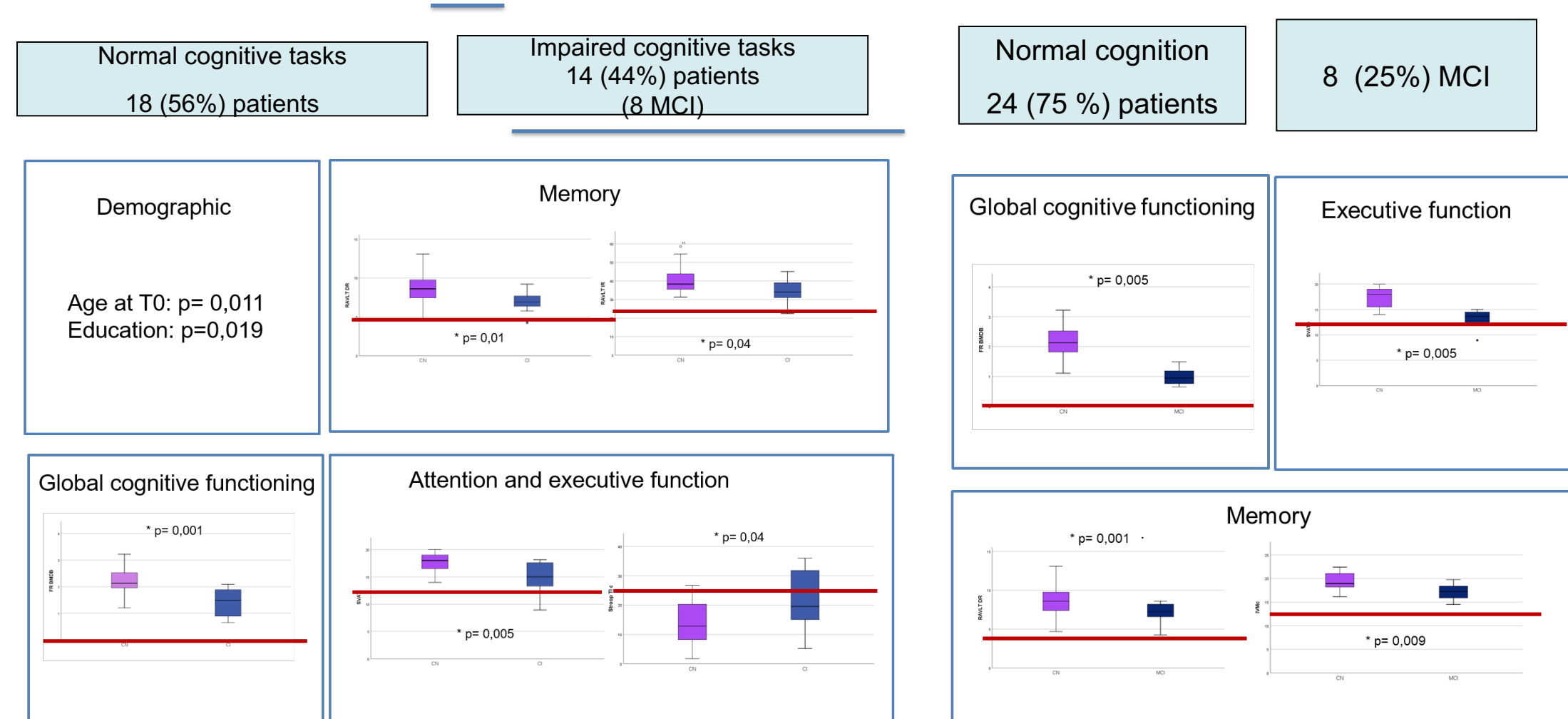
At T3, 5 patients had converted to overt disease (2 Parkinson's Disease, 1 prodromal Dementia with Lewy Bodies (DLB), 1 DLB, 1 Multiple System Atrophy).

SINDEM — Associazione Autonoma Aderente alla SIN per le Demenze

NOVARTIS