Epileptic patients' cognitive assessment with the Addendbrooke Cognitive Examination test Revised

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Introduction

The cognitive impairment is a very common symptom in epilepsy [1] and has a severe impact on life's quality [2]. The International League Again Epilepy (ILAE) recommended to value the cognitive assessment in all epilepsy patients (EP) [3], but it could be very demanding and a evaluated and approved screening test is not now available. The Mini Mental State Examination Test (MMSE) is a very useful, brief tool to screening patients for cognitive disorders. The Addenbrooke Cognitive Examination test Revised (ACE-R) is a brief, friendly use cognitive impairment that screening cognitive status. screening test, it's divide into five subscales (attention and orientation, fluency memory, language, visuospatial) (Fig.1). The aim of this study is to test whether the ACE-R is sensitive to detect cognitive deficits in EP and compare it to MMSE

Materials and Methods

We tested 33 EP (mean age 48.33±17.19; 17 females; age at onset 34.01±24.01 years'; time from diagnosis 14.32±14.35 years; monthly seizure rate 6.16±16.17; 9 idiopathic epilepsy, 17 cryptogenic epilepsy and 7 symptomatic epilepsy) and 21 healthy subjects (mean age 47.00±16.10 years; 13 females) with both ACE-R and MMSE (Tab. 2 and Fig. 2). We tested the difference of MMSE and the ACE-R total score and all the five subscores between EP and controls, and also between EP's subgroups. We also use the Chi-Square test to compare the total score in EP between MMSE and ACE-R in EP. Finally, we use the Pearson's correlation test to compare MMSE, ACE-R scores and clinical features in EP
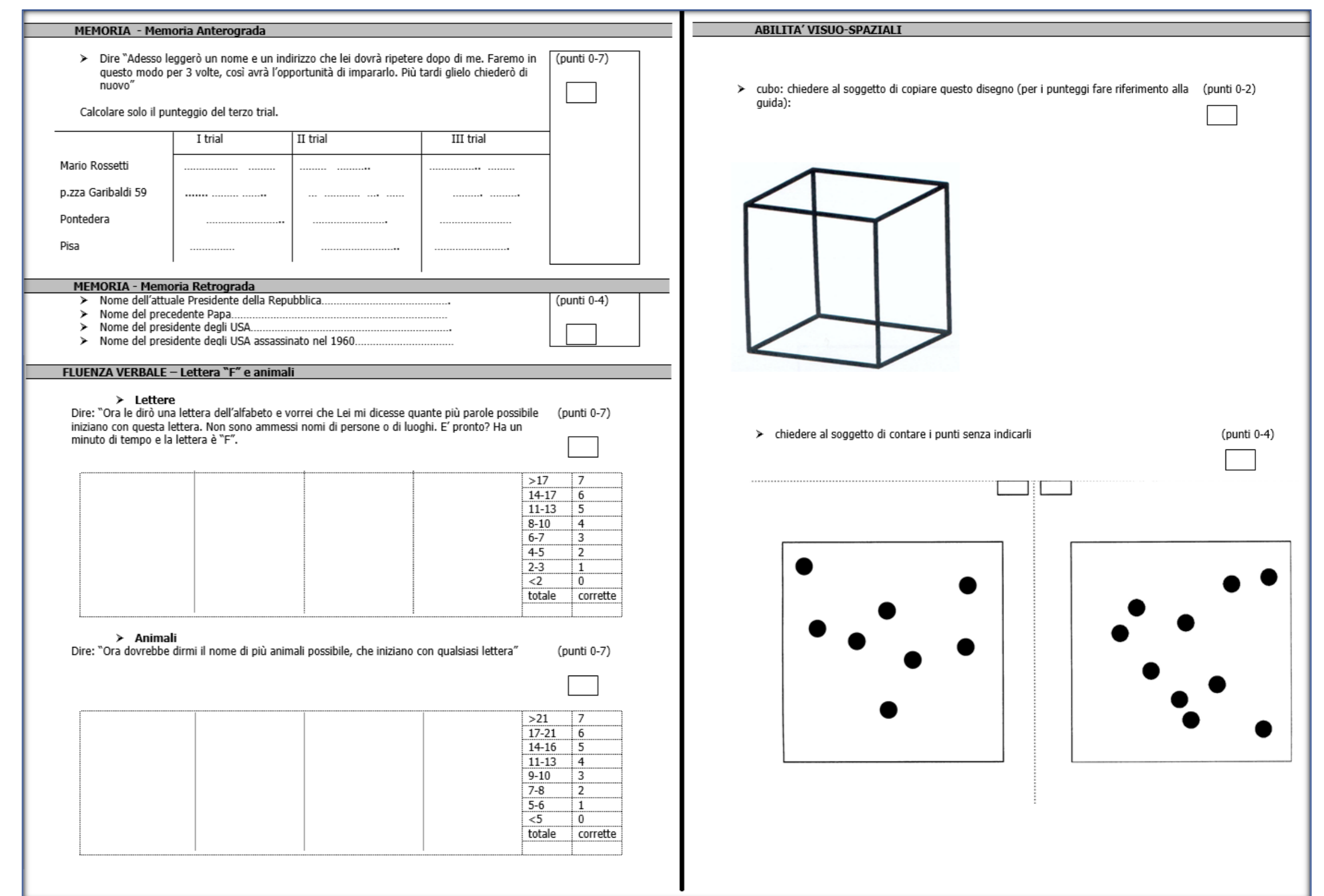

Fig. 1: Addenbrooke Cognitive Examination test Revised (ACE-R) items (memory, fluency and visuo-spatial)

	Female (%)	Age (y)	Schooling (y)	Age of onset (y)	Time from diagnosis (y)	Seizure frequency (monthly)	Antiepileptic Drugs (n)
EP	51,2%	48,33±17,19	12,66±3,97	34,01±24,01	14,32±14,35	6,16±16,17	1,30±1,01
Controls	61,9%	47,00±16.10	13.71±4.41	-	-	-	-

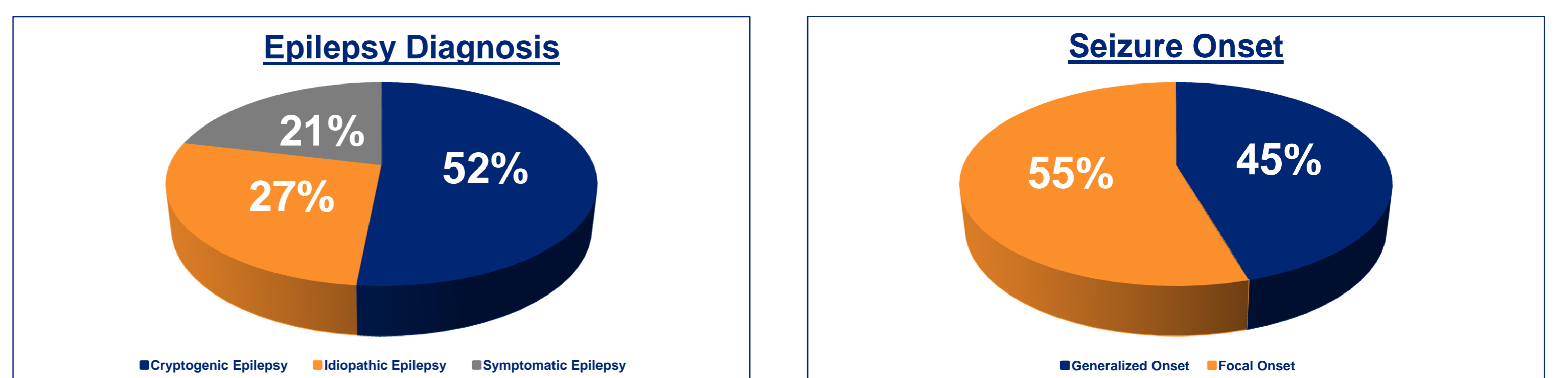**Tab. 1**: Demographic features of epilepsy patients and controls

Fig. 2: Clinical features of epilepsy patients (epilepsy diagnosis on the left, seizure onset on the right)

Results

In EP we found significant reduction in raw MMSE total score (p=0.02), in correct ACE-R total score (p=0.019), and in ACE-R subscores Fluency (p=0.007) and Visuospatial (p=0.026) (Fig. 3). Also, ACE-R showed that 12,2% (4 of 33) of EP have pathological score, while all MMSE scores of EP were in the physiological range (Fig. 4). The Chi-square show a significant statistically association between the MMSE and ACE-R scores (p=0,039) (Fig.5). When we compared the ACE-R's scores between all EP's subgroups (epilepsy diagnosis, seizure onset and age of onset) we found a significant reduction in early epilepsy onset patients (EP onset before 20 years') in ACE-R Language correct subscores (p<0,001). Finally, we found a significant correlation between MMSE and ACE-R total score (r=0.835, p<0.001), instead the Pearson's correlation test showed no correlation between ACE-R scores and some EP's clinical features (age, time from diagnosis, seizure frequency, number of antiepileptic drugs) (all p>0.1).
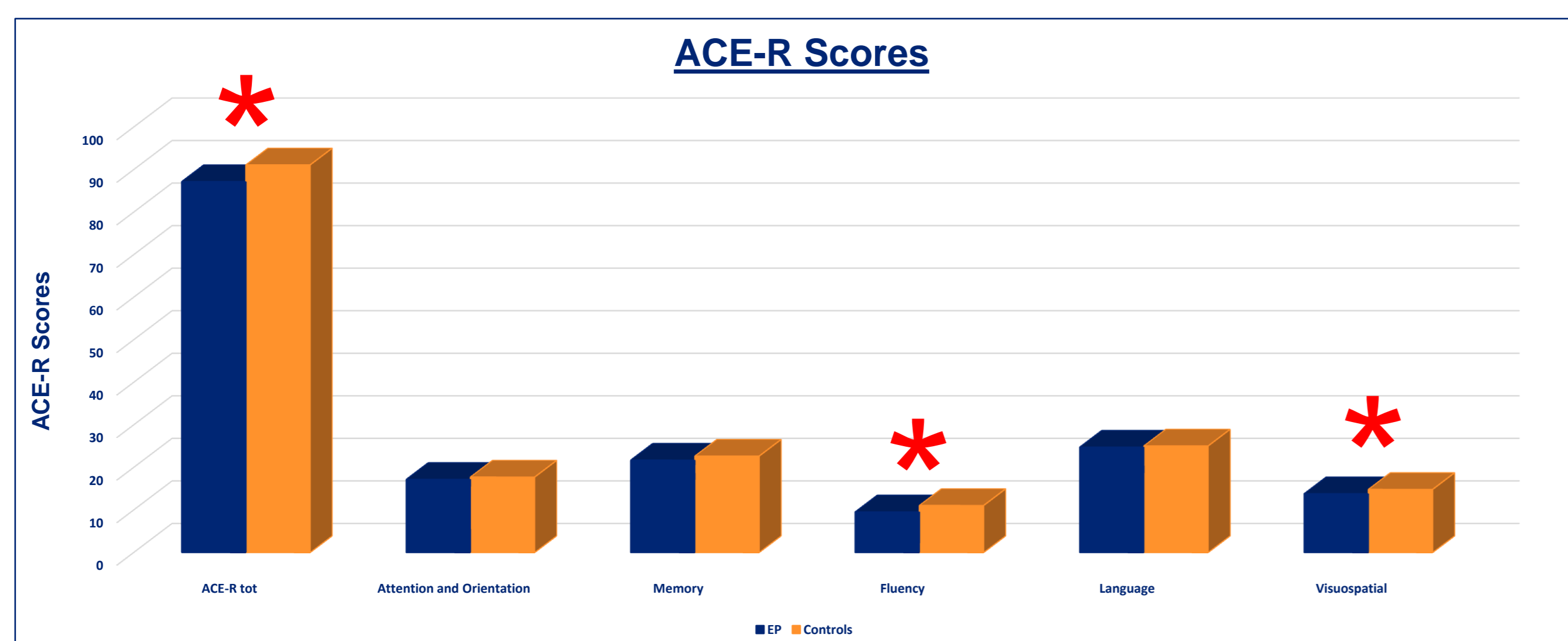

Fig. 3: Result of ACE-R scores in epilepsy patients and controls (total and all five subscores). Red asterisks mark differences statistically significance between controls and EP.
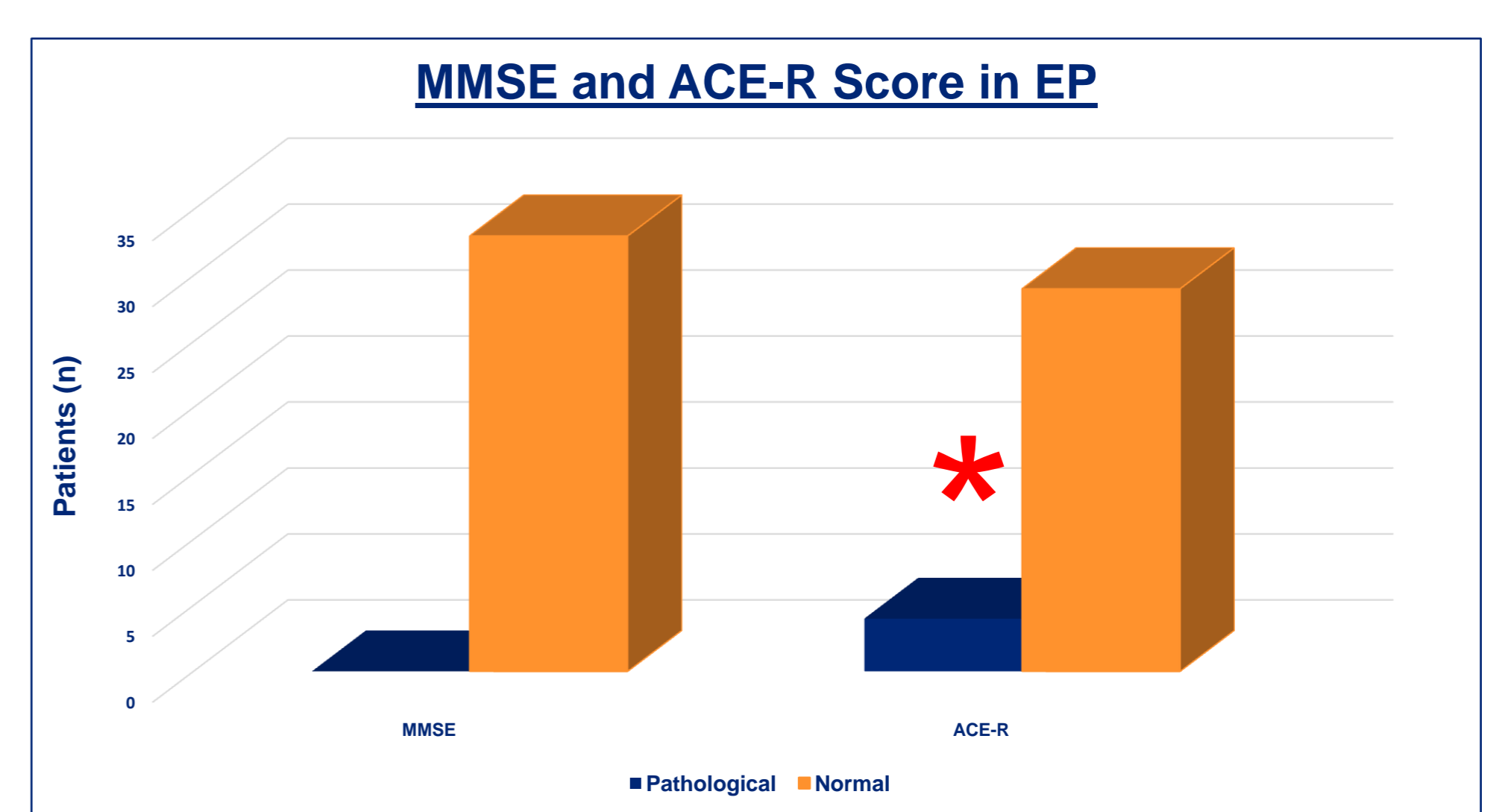

Fig. 4: Number of pathological and normal scores in epilepsy patients group at MMSE and ACE-R. Red asterisk marks difference statistically significance (p=0,039)

Conclusions

This is the first evidence of cognitive impairment in EP assessed with ACE-R. This study suggest that ACE-R is an easy-to-use short-term test sensitive to asses cognitive impairment in all EP group, as MMSE. Moreover we found that ACE-R is more sensible to detect cognitive deficit in EP than MMSE. This brief and reliable test can be a good candidate for cognitive screening of EP. Our data show that Early onset EP has a more significant deficits in language subscores, this seem to suggest that it could be a useful tool to screen cognitive differences between EP's subgruops, but an increase of the present sample is necessary to better characterize the sensitivity of ACE-R scores in the different subgroups of EP.

Bibliography

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