Complement system dysregulation in Idiopathic Generalized Epilepsy

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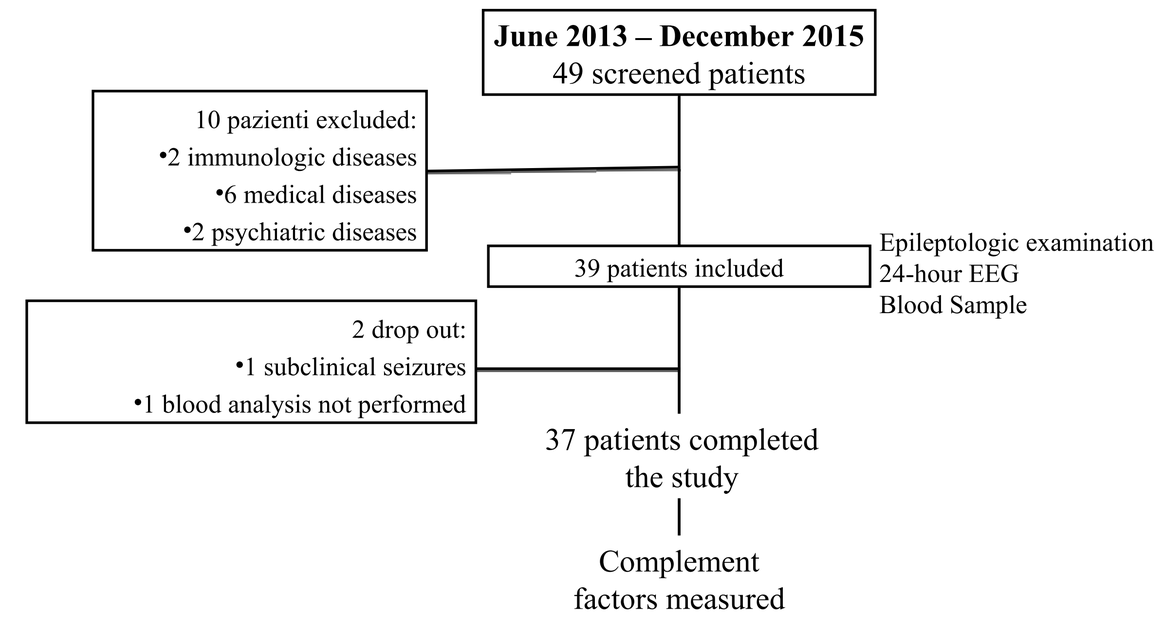
OBJECTIVE

Complement system activation has been invoked as a possible pathogenetic factor for epileptogenesis in animal model and human bioptic studies. Scarse and controversial data about complement factors assessment are present in literature. On these basis, the aim of the present study is to evaluate the complement factors C3 and C4 in patients affected by idiopathic generalized epilepsy (IGE).

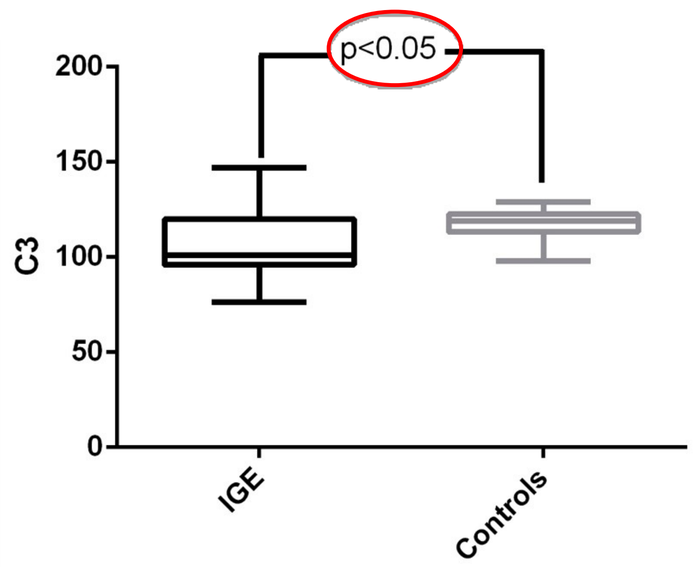
METHODS

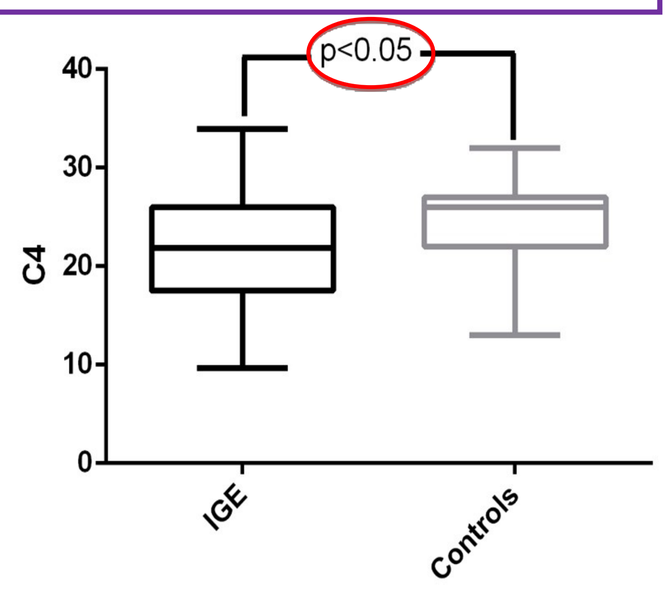
We enrolled patients affected by IGE admitted to our Epilepsy Centre undergoing neurological investigation, epilepsy diary, 24-h EEG recording, and blood sample for the assessment of C3, C4, fibrinogen and C-reactive protein (CRP) serum levels. We excluded patients showing inflammatory/infectious/autoimmune diseases, and patients who presented clinical and subclinical seizures in the 24 hours before the blood sample, in order to exclude complement factors changes owing to ictal conditions. We compared IGE patients to a group of healthy volunteers who underwent blood sample for the analysis of the aforementioned biomarkers.



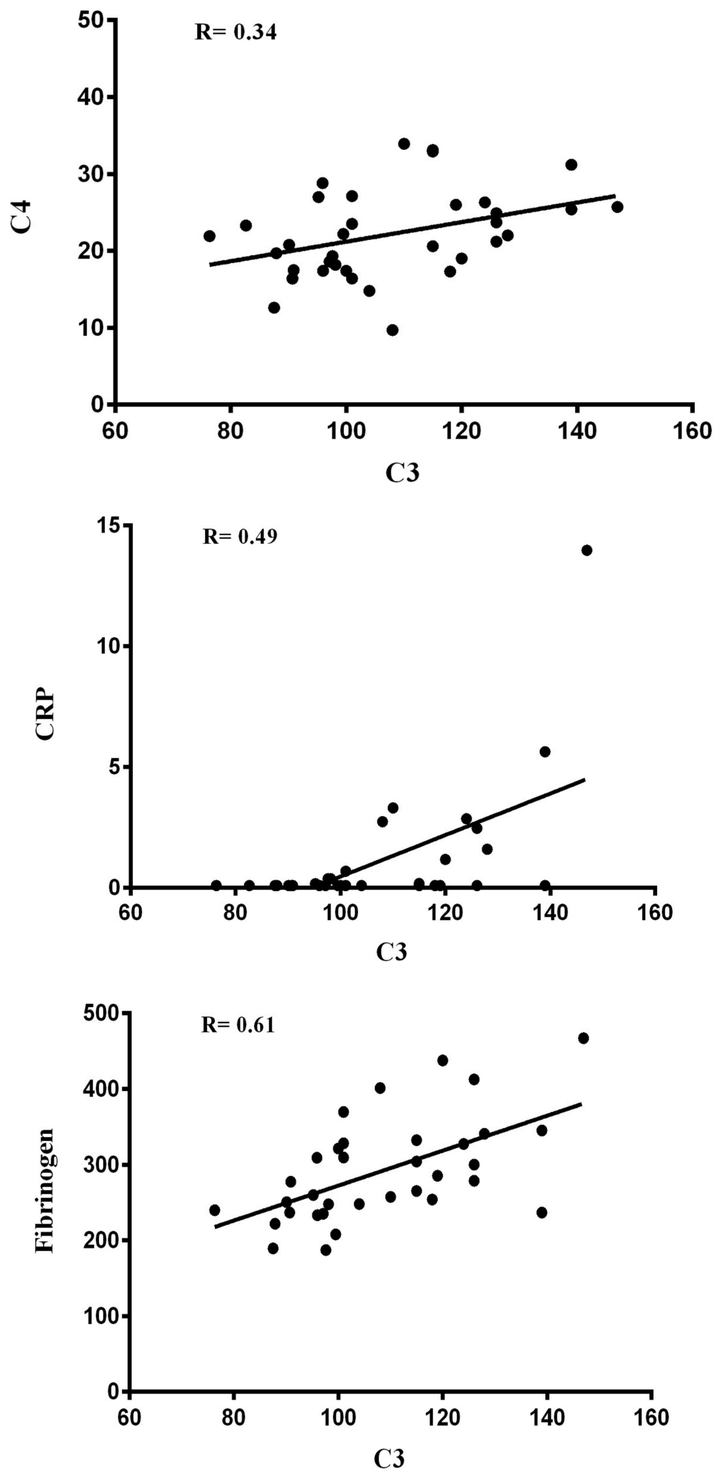
RESULTS

	EGI (n=37) *mean±SD*	Controls (n=20) *mean±SD*
Age	26.6±9.49	24.6±8.16
Sex	17F 20M	10F 10M
Fibrinogen (mg/dL)	291.6±68.48	/
C-Reactive Protein (mg/L)	1.1±2.60	/
C3 (mg/dL)	107.6±17.9	117.2±7.99
C4 (mg/dL)	22.2±5.77	24.85±4.53





EGI (n=37)		
	VPA (n=15) mean±SD	**Other treatments (n=13) mean±SD**
Age	28.9±9.3	25±9.75
Sex	5F 10M	12F 10M
Fibrinogen (mg/dL)	269.9±53.42	309.5±75.95
C-Reactive Protein (mg/L)	0.6±1.49	1.3±3.2
C3 (mg/dL)	110.9±17.6	105±17.32
C4 (mg/dL)	21.7±5.54	21.9±5.57
	Therapy (n=28) mean±SD	**Drug-naive (n=9) mean±SD**
Age	27.7±9.79	19.9±5.69
Sex	12F 16M	5F 4M
Fibrinogen (mg/dL)	294.1±70.56	273.8±59.08
C-Reactive Protein (mg/L)	1.2±2.82	0.5±0.09
C3 (mg/dL)	109.1±17.17	99±15.75
C4 (mg/dL)	23±5.52	17.7±4.92
	Seizures Free (n=21) mean±SD	**Persistent seizures (n=16) mean±SD**
Age	27±8.98	26.1±10.32
Sex	10F 11M	7F 9M
Fibrinogen (mg/dL)	275.5±54.24	314.6±81.46
C-Reactive Protein (mg/L)	0.7±1.46	1.7±3.66
C3 (mg/dL)	107.3±15.84	108.1±19.4
C4 (mg/dL)	21.7±6.52	22.8±4.73



CONCLUSIONS

We documented the significant alteration of complement system in IGE patients. Consistently, since we exclude ictal conditions, we suppose that the complement system dyregulation may be basically present in IGE patients. The reduction of C3 and C4 serum levels may be the expression of the hyperactivation of the complement system. Moreover, taking into account the correlation between C3 and the other biomakers, we may speculate that the inflammatory drivers present in epiepsy patients may concur in altering the complement system activity. Finally, since drug-naive IGE patients showed the lowest C3 and C4 levels, it is conceivable that antiepileptic treatments may modulate the complement system reducing its hyper-activation.

This study highlights the finding that complement system dysregulation may concur in epilepeptogenesis, also in IGE.