Original article

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A comparison between the 1981 and 2017 International League Against Epilepsy classification of seizure types based on an outpatient setting

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Background

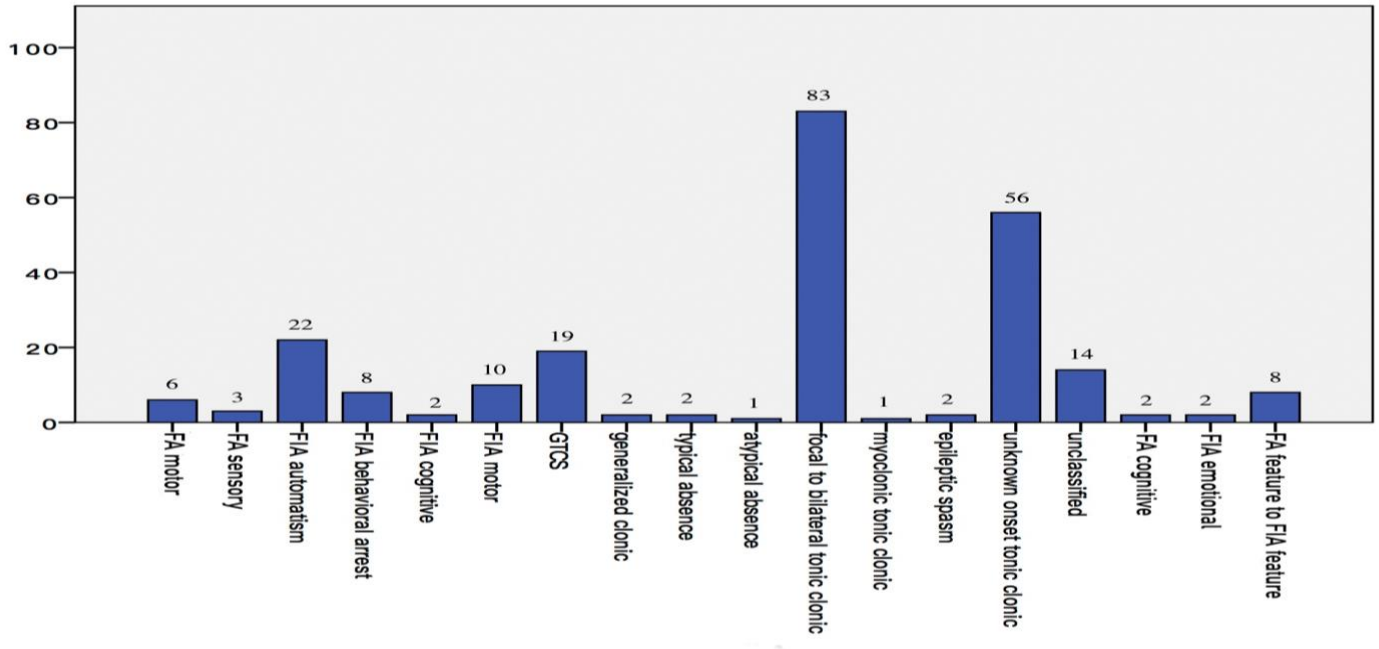
- To date, there is no published report on the clinical use of the 2017 seizure classification.
- It is worthwhile to test the classification in real-life settings in order to reveal any difficulties or issues as well as to promote its usage.

Method

- The data of 200 patients was retrospectively collected from an outpatient epilepsy registry of The Epilepsy Center, West China Hospital.
- Basic history, EEG, and MRI for each patient was collected.
- Classification was made according to the official ILAE reports of seizure classification for 1981 and 2017.
- The 2017 and 1981 seizure classification results for these 200 patients were compared and analyzed .

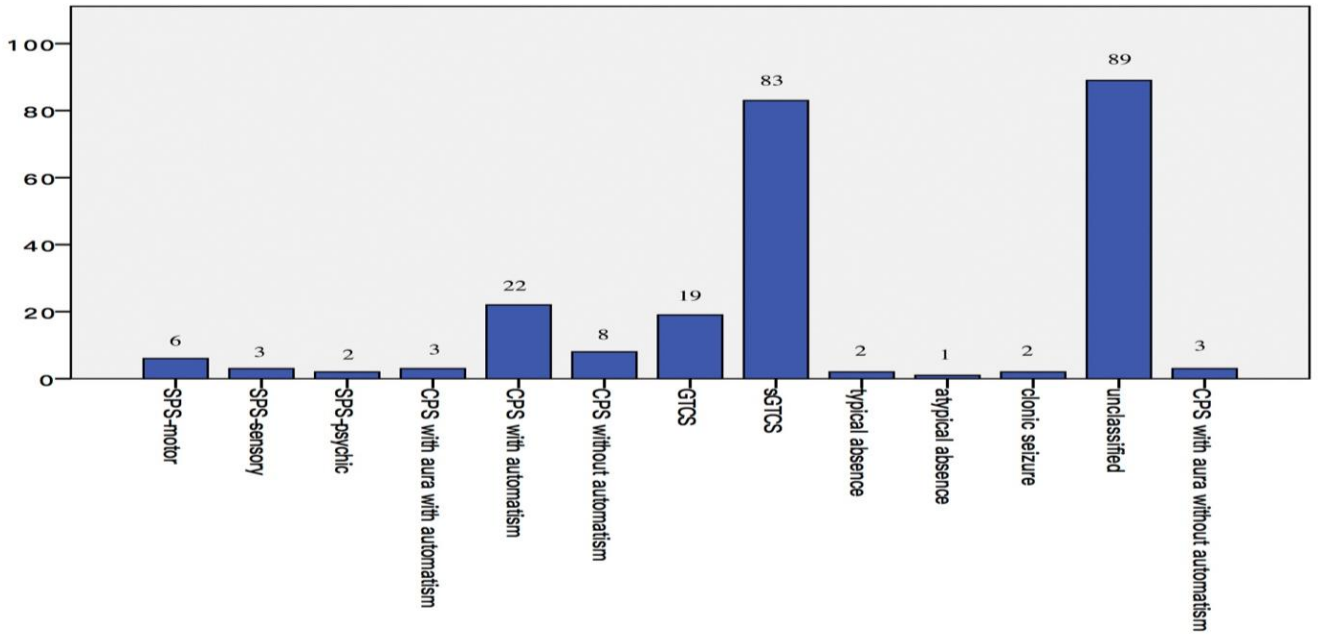
Results - Distribution of seizure types

200 patients had 243 seizure manifestations



The distribution of seizure types in the 2017 classification

The top 3 seizure types based on the 2017 classification were focal to bilateral tonic-clonic (83, 34.1%), unknown-onset tonic-clonic (56, 23.0%), and focal impaired awareness (54, 22.2%).



The distribution of seizure types in the 1981 classification

The top 3 seizure types based on the 1981 classification system were unclassified (89, 36.6%), secondary generalized tonic-clonic seizures (sGTCS) (83, 34.1%), and complex partial seizures (CPS) (36, 14.8%).

Results – A comparison of terms

Clear correlation			Unclear or no correlation		
Term		Relationship	Term		Relationship
1981	2017		1981	2017	
SPS-motor	FA-motor	A	SPS-psychic	FA-cognitive	C
SPS-sensory	FA-sensory	A		FIA-cognitive	
CPS with automatism	FIA with automatism	A	SPS-affective	FA-emotional	C
CPS without automatism	FIA with behavioural arrest	A		FIA-emotional	
sGTCS	Focal to bilateral tonic clonic	A	-	FIA-motor	-
GTCS	GTCS	B	-	Myoclonic(clonic) tonic clonic	-
Generalized tonic/clonic	Generalized tonic/clonic	B	-	Epileptic spasm	-
Typical/Atypical absence	Typical/Atypical absence	B	-	Unknown onset tonic clonic	-

A=Changed term referring to the same manifestation; B=Same term;
C=New term possibly referring to the listed old term but not exactly the same.

Results – A ccomparison of terms

Differences and traits of the 2017 relative to the 1981 classification

Differences	Traits	Examples
New term (31.7%; 77)	Showing details (2)	Focal aware cognitive (clearly showing the awareness level)
	Can be classified (75) (also showing details because of being classified)	Unknown-onset tonic-clonic Focal impaired awareness motor Focal impaired awareness cognitive Focal impaired awareness emotional Focal aware to focal impaired awareness motor Myoclonic-tonic-clonic Epileptic spasm
Term change (53.5%; 130)	Similar (31)	Focal aware sensory/motor Focal impaired awareness automatism
	Showing details (16)	Focal impaired awareness with behavioural arrest Generalized clonic/tonic Focal aware to focal impaired awareness with automatism/behavioural arrest
	Showing origin (83)	Focal to bilateral tonic-clonic
Same term (9.1%; 22)	-	GTCS, typical absence, atypical absence

Results - Unclassified cases

- Seventy-five of 89 (84.3%) unclassified cases based on the 1981 classification were classified using the 2017 classification (aided by the addition of the “unknown origin” category and a flexible combination of different levels).
- In 14 cases, seizures were unclassifiable using both classifications systems (eight were rare manifestations with awareness or unusual bilateral movements that were both difficult to evaluate, and six were due to a lack of detailed description for classification).

Unclassifiable cases based on the 1981 classification or both classifications

Situation	Number	Details of the situation with typical case scenarios
1981-unclassifiable 2017-classifiable	75	1. Unknown-onset tonic-clonic (56) 2. Focal impaired awareness motor (10) 3. Focal impaired awareness cognitive (2) 4. Focal impaired awareness emotional (2) 5. Epileptic spasm (2) 6. Focal awareness features followed by focal impaired awareness motor (not automatism) (2) 7. Myoclonic-tonic-clonic (1)
Both unclassifiable (good clinical information)	8	1. Focal awareness features at onset to impaired awareness with bilateral movement, but not involving the whole body, often only both upper limbs or lower limbs (7) (*see supplementary data: Patient 8, 13, 21, 31, 50, 134, 14*) 2. Intact consciousness with tonic movement of all limbs (1) (*supplementary table 1: Patient 93*)
Both unclassifiable (lack of information)	6	1. Lost of contact with patient, therefore important information lacking for classification (5) (*see supplementary data: Patient 104, 142, 144, 151*) 2. No witness of onset: no evaluation of impairment of awareness or other motor features (1) (*supplementary table 1: Patient 30*)

Conclusion and significance

- The 1981 and 2017 seizure classification systems were compared based on 200 clinical cases of epilepsy.
- Most of the terms in the 1981 classification correspond to those of the 2017 classification, but 2017 terms are more clear with regards to detail and accuracy.
- Introduction of new terms and flexible combinations of awareness level and motor/sensory features during seizures allows more cases to be classified.
- The 2017 seizure classification is improved and represents a steady transition from the 1981 seizure classification.
- New research on epilepsy, especially on epileptic networks, may be the trend in the future, leading to more accurate classification .