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Suspected seizures and convulsions:
Cross-sectional study in East Midlands Ambulance Service

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Background

- Suspected convulsions/seizures include epilepsy and other conditions.
- Incidence of around 1% in the UK.
- Up to 30% repeat pre-hospital calls.
- Costs NHS approximately £56.2million for hospital admissions alone.
- Improved management could save lives and NHS costs.

Research Questions

- **Pre-hospital care of patients after a suspected seizure: incidence and patient characteristics**

- **What are the predictors of transport to hospital?**

It is possible that a large proportion of patients transported to hospital EDs after a seizure would be suitable for out-patient management

Inclusion-Exclusion Criteria

- **Age: Adult patients (≥16 years)**

- **One year: 1st August 2011 - 31st July 2012**

- **Chief complaint– Convulsions/fits.**

- **EMAS ePRF and paper scanned PRF.**

Descriptive Results

Rank	Protocol AMPDS	EMAS	EMAS %
1	17:FALLS	29,390	13.91
2	10:CHEST PAIN (NON-TRAUMATIC)	18,501	8.76
3	6:BREATHING PROBLEMS	14,931	7.07
4	26:SICK PERSON (SPECIFIC DIAGNOSIS)	11,551	5.47
5	31:UNCONSCIOUS / FAINTING (NEAR)	9,115	4.31
6	**12:CONVULSIONS / FITTING**	**6,306**	**2.98**
7	23:OVERDOSE / POISONING (INGESTION)	5,923	2.8
8	21:TRAUMATIC INJURIES (SPECIFIC)	5,141	2.43
9	30:HAEMORRHAGE / LACERATION	4,908	2.32
10	28:STROKE (CVA)	4,871	2.31
	Total (all incidents)	211317	-

Descriptive Results
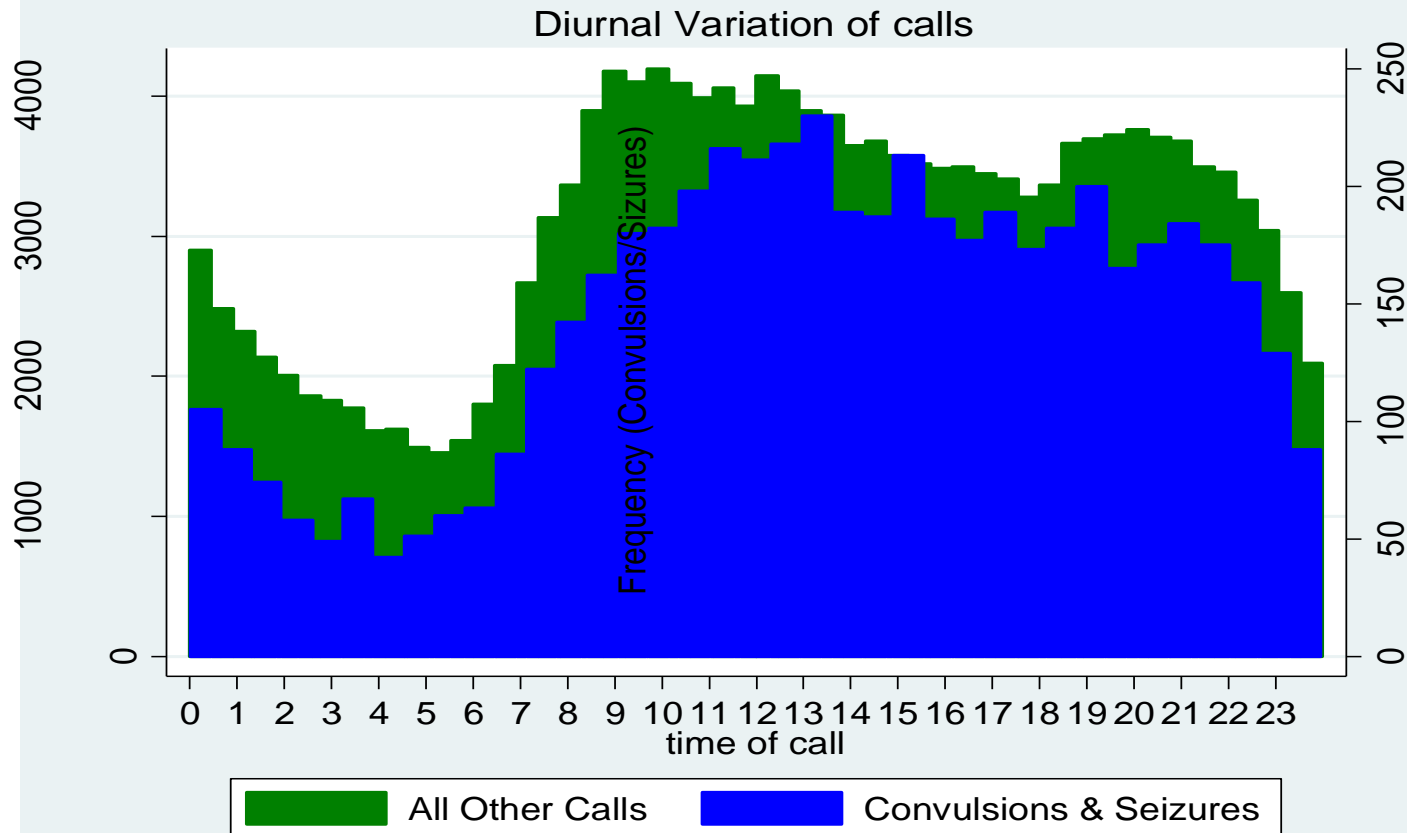
Diurnal Variation of calls

Descriptive Results

	All cases		Suspected Convulsions and Seizures only		
	N=172831	Col %	N=4884	Col %	χ^2
Sex					
Female	88137	51.0%	2096	42.9%	P<0.001
Male	77580	44.9%	2571	52.6%	
missing	7114	4.1%	217	4.4%	

Descriptive Results

	All cases		Suspected Convulsions and Seizures only		
	N=172831	Col %	N=4884	Col %	χ^2
Ethnicity					
Asian	1547	0.9%	46	0.9%	
Black	654	0.4%	13	0.3%	
Mixed Other	771	0.4%	29	0.6%	**p=0.376**
White	90289	52.2%	2735	56.0%	
missing	79570	46.0%	2061	42.2%	

Descriptive Results

	All cases		Suspected Convulsions and Seizures only		
	N=172831	Col %	**N=4884**	Col %	χ^2
Age group					
16-33	29253	16.9%	1725	**35.3%**	
34-49	25733	14.9%	1483	**30.4%**	
50-64	26487	15.3%	850	**17.4%**	p<0.001
Over65	91358	52.9%	826	**16.9%**	

Descriptive Results

	All cases		Suspected Convulsions and Seizures only		
	N=172831	Col %	**N=4884**	Col %	χ^2
IMD Rank					
Most 1	18840	10.9%	724	**14.8%**	p<0.001
2	10479	6.1%	317	**6.5%**	
3	7981	4.6%	228	4.7%	
4	7653	4.4%	218	4.5%	
Least 5	5073	2.9%	113	2.3%	
Missing	122805	71.1%	3284	67.2%	

Descriptive Results

	All cases		Convulsions and Seizures only		
	N=172831	Col %	**N=4884**	Col %	χ^2
AVPU					
Alert	131998	76.4%	2653	**54.3%**	
Voice	6519	3.8%	815	**16.7%**	
Pain	1942	1.1%	286	**5.9%**	p<0.001
Unresponsive	4332	2.5%	301	**6.2%**	
Missing	28040	16.2%	829	17.0%	

Descriptive Results

X^2 Statistic : **p>0.05**	
Statistically Non-significant Variables	
Airway	Ethnicity
ECG	
Urban or Rural	
O_2 Saturation	

X^2 Statistic :Comparing convulsions/fitting with all other cases **p<0.001**	
Statistical Significant Variables	
Supplementary oxygen	
GCS	Respiratory rate
Diazepam	Heart rate
Response priority (red , green)	Systolic BP
NEWS score (0,1,2,3)	Temperature
Blood glucose	Time spent on scene

Regression Analysis

Treated and Transported	Coef.	P-value	[95%	Interval]
Age group				
34-49	0.05	0.07	0	0.1
50-64	0.08	**0.01**	0.02	0.14
over65	0.05	0.1	-0.01	0.12
Normal vs Abnormal				
respiratory rate	0.07	**0.02**	0.01	0.13
temperature	0.09	**0**	0.05	0.13
heart rate	0.11	**0**	0.07	0.16
supplementary oxygen (Y/N)	0.05	**0.02**	0.01	0.09
GCS (15:<15)	0.01	**0.02**	0.02	0.02
diazepam (Y/N)	0.17	**0**	0.08	0.26

Research in progress

- Develop innovative models of care that could improve quality and cost effectiveness of emergency care for suspected seizures in the NHS.

- Apply for further funding.

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Community and Health Research Unit

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References

- 1)National Institute of Clinical Excellence. Guideline Development Methods: Information for National Collaborating Centres and Guideline Developers. Updated 2005 ed. London: National Institute for Clinical Excellence; 2004.
- (2) Hauser WA, Annegers JF, Kurland LT. Incidence of epilepsy and unprovoked seizures in Rochester, Minnesota: 1935-1984. Epilepsia 1993; 34(3):453-468.
- (3) Annegers JF, Hauser WA, Lee JR, Rocca WA. Incidence of acute symptomatic seizures in Rochester, Minnesota, 1935-1984. Epilepsia 1995; 36(4):327-333.
- (4) Cockerell OC, Johnson AL, Sander JW, Hart YM, Goodridge DM, Shorvon SD. Mortality from epilepsy: results from a prospective population-based study. Lancet 1994; 344(8927):918-921. (
- 5) Hart YM, Sander JW, Johnson AL, Shorvon SD. National General Practice Study of Epilepsy: recurrence after a first seizure. Lancet 1990; 336(8726):1271-1274.
- (6) Berg AT, Shinnar S. The risk of seizure recurrence following a first unprovoked seizure: a quantitative review. Neurology 1991; 41(7):965-972.
- (7) Wiebe S. An evidence based approach to the first unprovoked seizure. Can J Neurol Sci 2002; 29(2):120-124.
- (8) Hauser WA, Rich SS, Lee JR, Annegers JF, Anderson VE. Risk of recurrent seizures after two unprovoked seizures. N Engl J Med 1998; 338(7):429-434
- (9) Dickson JM, et al. BMJ Open 2016;6:e010573. doi:10.1136/bmjopen-2015-010573

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