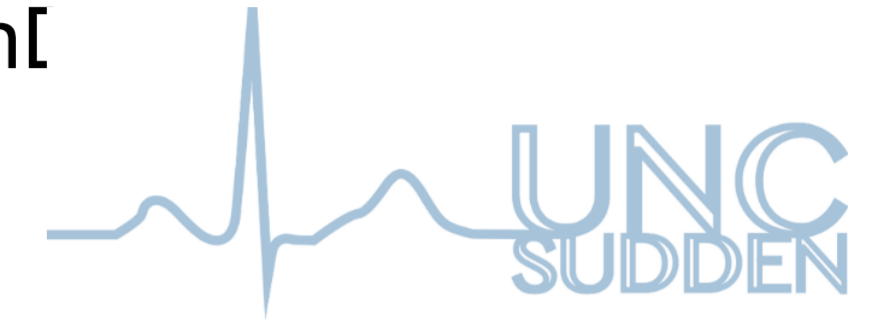


Seizure History and Alcohol Abuse as Predisposing Factors for Out-of-Hospital Sudden Unexpected Death

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Background

- The role of seizure disorders and alcohol abuse in out-of-hospital sudden unexpected death (OHSUD) may be underestimated due to prior studies' focus on cardiac causes of sudden death.
- The World Health Organization (WHO) defines sudden cardiac death as a witnessed death or an unwitnessed death occurring within 24 hours of when the subject was last seen alive.

We compared alcohol abuse and seizure disorder in OHSUD victims according to whether or not they met a time-restricted definition of sudden cardiac death.

Methods

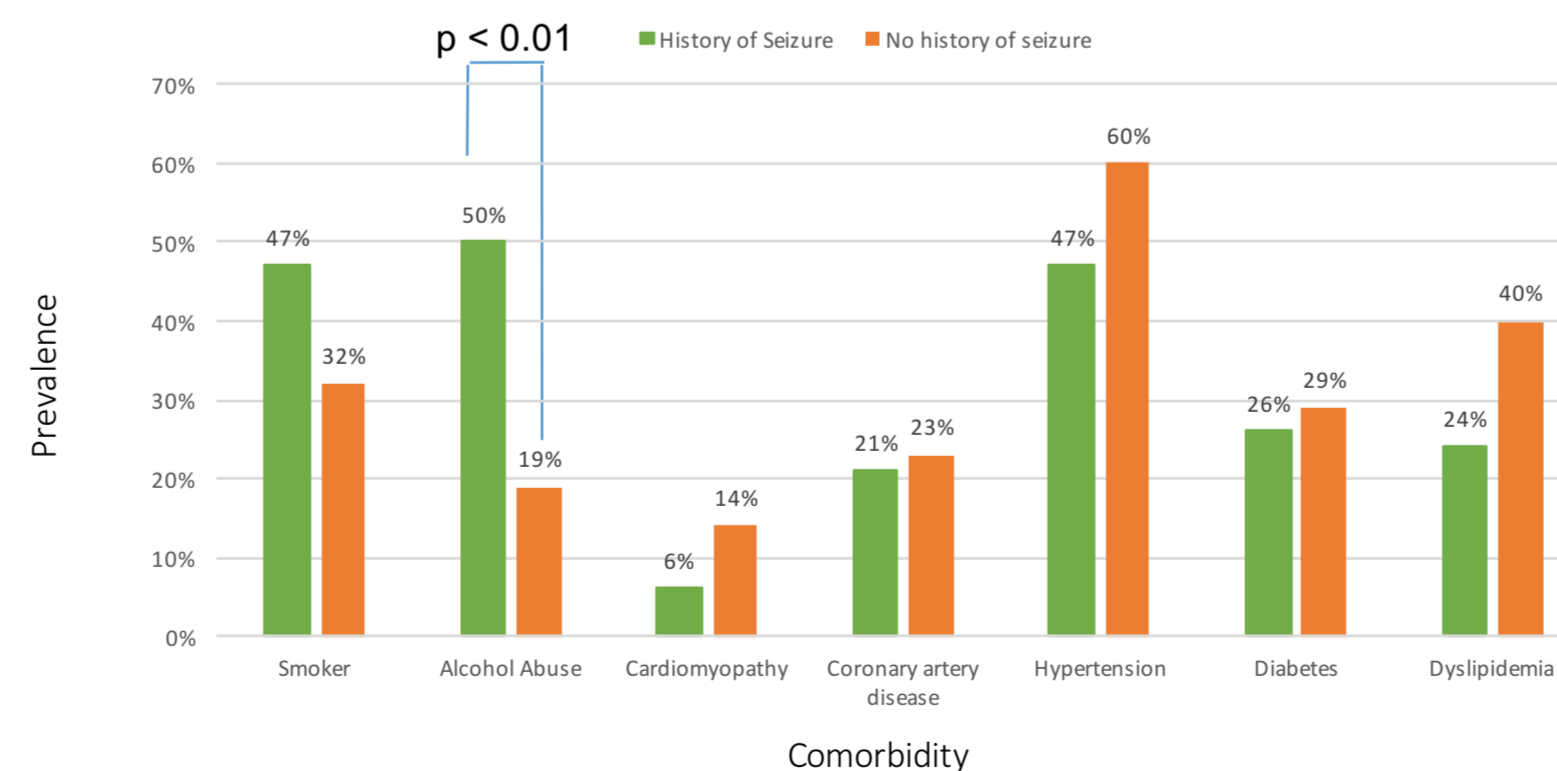
- From 2013-2015, all out-of-hospital deaths in a predominantly urban region (population 974,289) were screened to identify presumed OHSUD cases among free living adults ages 18-64.
- Data from death certificates, medical records and post-mortem examinations were reviewed to adjudicate cases of OHSUD and to determine history of seizures and other comorbidities.
- Seizure history included epilepsy, alcohol withdrawal seizures, and otherwise specified seizure history, excluding isolated seizures at the time of death. Those with lethal levels of alcohol in toxicology report were excluded.
- Using the sudden death criteria established by the WHO, all adjudicated OHSUD cases were categorized into two subgroups: WHO (witnessed or unwitnessed < 24 h) and Non-WHO (all other cases).
- The prevalence of seizure disorders and comorbidities were subsequently compared between these subgroups.

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Results

- Of the 408 adjudicated OHSUD cases, 397 (97%) had medical records, post-mortem examinations, or death certificates available.
- Of all adjudicated cases, 34 (9%) had history of seizures and 363 (22%) had a history of alcohol abuse.
- Those with history of seizure had an average age of 53.1 years and an average of BMI 27.4. In those without history of seizure, the average age was 53.1 years, average BMI was 30.6. The percentage of males and females was approximately equal in both groups.
- The prevalence of alcohol abuse was higher among those with a history of seizure compared to those without a history of seizure (50% vs 19%; $p < 0.01$)
- There were nonsignificant trends between history of seizure and lower rates of hypertension (47% vs. 60% $p = 0.202$), dyslipidemia (24% vs 40% $p = 0.07$) and cardiomyopathy (6% vs 14%; $p = 0.29$).

Figure 1. Comparison of comorbidities in seizure history vs no seizure history groups in all adjudicated cases with medical histories (N = 397)



- Of the 397 cases with medical histories, 148 (37%) were classified as sudden cardiac by the World Health Organization.
- 8 out of the 34 (24%) cases with history of seizure met the WHO criteria for sudden cardiac death
- The prevalence of seizure history among the Non-WHO cases was slightly higher than that among the WHO cases (10% vs 5.4%; $p = 0.1$).

Table 1. Comparison of comorbidities in WHO vs non-WHO groups in all adjudicated cases with history of seizure (N = 34)

	WHO (n=8)	%	Non WHO (n = 26)	%	p-value for comparison
Average Age	54.1	--	52.8	--	--
Average BMI	25.7	--	27.9	--	--
Female	2	25%	9	35%	1
Smoker	4	50%	12	46%	1
Alcohol Abuse	0	0%	12	46%	0.03
Cardiomyopathy	3	38%	2	8%	0.07
Coronary artery disease	2	25%	4	15%	0.6
Hypertension	3	38%	14	54%	0.7
Diabetes	1	13%	6	23%	1
Dyslipidemia	5	63%	7	27%	0.1

Conclusions

- Seizure disorder and alcohol abuse were common in out-of-hospital sudden unexpected death victims.
- Time-restrictive definitions may exclude many victims with history of seizure and alcohol abuse from the classification of out-of-hospital sudden unexpected death.
- Primary care physicians and cardiologists should be aware of the strong associations between seizure disorders, alcohol abuse, and out-of-hospital sudden unexpected death.

References

1. Report of a Working Group on Ischaemic Heart Disease Registers. Euro 5010 1969. Copenhagen: 1969. Parts I and II. Regional Office for Europe WHO.