

Clinical Manifestation of Non-ketotic Hyperglycemic Induced Seizures

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Introduction

- Focal seizures can arise for various reasons; non ketotic hyperglycemic seizures (NKHS)
- NKHS has been reported since 1969, first by James
- Seizure 2003; Somsak Tiamkao proposed criteria
- Criteria: plasma glucose more than 290 mg %
plasma osmolarity 288 mOsm/kg
seizure stopped after BS controlled
- **Limitation: 5/21 cases had undergone a CT-brain**

Introduction

- NKHS: delayed diagnosis, wrong management, unnecessary use of AED and brain imaging
- NKHS were most common in Thailand, North-eastern

Objective

- To emphasize the clinical manifestation of NKHS
- To evaluate how important of CT-brain in NKHS

Methods

- Retrospective study in Srinagarind hospital, Khon Kaen university
- NKHS: Jan 1, 1993 to December 31, 2003
- Tiamkao in Seizure 2003 criteria
- Normal brain imaging / without brain imaging
- Excluded cases with other causes; sepsis, metabolic imbalanced, others

Results

- 54 NKHS
- 21 NKHS with normal brain imaging
- 33 NKHS; no brain imaging (15), abnormal brain imaging (11), plasma glucose less than 290 mg % (3), other (10)

Results

- 21 NKHS (11 male: 10 female)
- 51-70 years
- 13/21(61.90%) no previous history of DM
- 17/21(80.95%) partial seizures
- 16/17 epilepsia partiallis continua

Results

- Mean duration from onset to hospital 118:43 hr (4-336hr)
- Mean frequency of seizures 44.99 (1-146)
- Mean time from onset to control 178.7 hr (75-600 hr)
- Initial PG 532 ±164.9 (299-979 mg%)
- Mean post-ictal PG 190.25

Figure 1 showed the correlation between time to seizure control and time to admission.

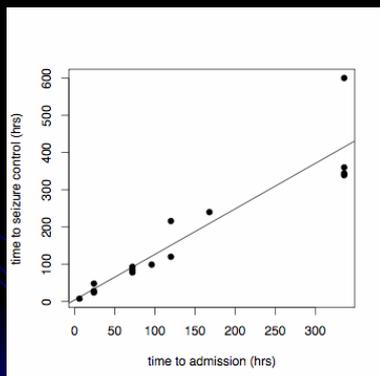


Table 1: Comparison of clinical results between present study (21 cases with negative brain imaging), 11 clinically-diagnosed NKHS without brain imaging, and previous study⁶ (21 cases with 5 cases of negative brain imaging).

Clinical characteristics	Present study	NKHS without brain imaging	Previous study
Type of seizure	Partial seizures (80.95%)	Partial seizures (90.90%)	Partial seizures (95.65%)
Part of body where seizure began	left hand, arm	upper part > lower left side > right	upper > lower part left side > right
No history of previous diabetes	13/21 (61.90%)	4/11 (36.36%)	15/21 (71.40%)
Mean duration from onset to admission	4.93 days	4.60 days	5.00 days
Initial blood sugar at admission	299 -979 mg/dL (16.70-54.39 mmol/L)	312-1355 mg/dL (17.32-75.20 mmol/L)	290-1,099 mg/dL (16.11-61.33 mmol/L)
Blood sugar after seizure controlled	74-436 mg/dL (4.13-24.34 mmol/L)	109-472 mg/dL (6.05-26.20 mmol/L)	74-390 mg/dL (4.11-21.67 mmol/L)

Results

- Linear model for association factor for seizure control
- PG, osmo, age, sex, frequency of attack
- Time to seizure control associated with time to admission
- P value 0.02, R- square 0.83

Conclusion

- Most common type of NKHS was EPC
- Controlled by glycemic controlled
- Type 2 DM, EPC, normal neurological examination, high PG
- No need brain imaging