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

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 epilepsy partialis continua

Table 1: Comparison of clinical results between present study (21 cases with 5 cases of negative brain imaging) and previous study (21 cases with 5 cases of negative brain imaging).

<table>
<thead>
<tr>
<th>Clinical characteristics</th>
<th>Present study</th>
<th>NKHS without brain imaging</th>
<th>Previous study</th>
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</thead>
<tbody>
<tr>
<td>Type of seizure</td>
<td>Partial seizures (80.95%)</td>
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<tr>
<td>Part of body where seizure began</td>
<td>Left hand, arm (61.90%)</td>
<td>Upper &gt; lower (71.40%)</td>
<td>Upper &gt; lower (61.11%)</td>
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<tr>
<td>No history of previous diabetes</td>
<td>13/21 (61.90%)</td>
<td>4/11 (36.36%)</td>
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<tr>
<td>Mean duration from onset to admission</td>
<td>4.93 days</td>
<td>4.00 days</td>
<td>5.00 days</td>
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<tr>
<td>Initial blood sugar at admission</td>
<td>290-973 mg/dL (16.20-54.30 mmol/L)</td>
<td>310-1555 mg/dL (17.30-72.20 mmol/L)</td>
<td>290-1,000 mg/dL (16.10-54.33 mmol/L)</td>
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<tr>
<td>Blood sugar after seizure controlled</td>
<td>74-436 mg/dL (4.15-24.54 mmol/L)</td>
<td>109-472 mg/dL (6.05-26.22 mmol/L)</td>
<td>74-390 mg/dL (4.11-21.67 mmol/L)</td>
</tr>
</tbody>
</table>

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

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%)