The association of coronary spasm and B-type natriuretic peptide

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Background

- B-type natriuretic peptide (BNP)
  1) Cardiac neurohormone secreted from the ventricles in response to ventricular volume expansion and pressure overload.
  2) Potential diagnostic marker for CHF (Morrison et al. JACC, 39:202-9, 2002)
Action of BNP


2) natriuretic and diuretic effect  \( (\text{Hobbs et al. Am J Cardiol. 78:896-901, 1996}) \)


4) decrease myocardial fibrosis  \( (\text{Cao et al. Hypertension. 25:227-34, 1995}) \)

5) counter-regulatory hormone to AT-II, NE, and endothelin-1
• So increased BNP level indicates
  1) Increased pulmonary capillary wedge pressure
  2) Increased LV end diastolic pressure
  3) LV systolic or diastolic dysfunction

→ practical marker of LV dysfunction
• Vasospastic angina and BNP

1) One previous study suggested that in patients with hyperventilation-induced anginal attack and ECG changes are suppressed by IV infusion of BNP in supraphysiological doses


2) The adequate duration of medical therapy and their efficacy with the time are varying among previous reports in vasospastic angina
Hypothesis

• Is there any association between BNP level and vasospastic angina (??)

• We hoped BNP as a marker of treatment and drug titration in patients with documented vasospastic angina with normal LV systolic function
Objective

• To determine the association and relationship between BNP and vasospastic angina in the patients without LV systolic dysfunction
Subject and Study Design

1342 patients with chest pain

CAG and Ach provocation test

Exclusion: 793 pts
- CAD, LVEF<50%, valvular heart dz., arrhythmia

Inclusion: 549 pts
- Spasm group: 192 pts
- Control group: 357 pts
Method

• Vasospastic angina
→ More than 70% coronary artery stenosis by QCA during acetylcholine provocation test with or without chest pain and ECG change.

• Total 549 pts were enrolled
→ Spasm group = 192 pts
→ Control group = 357 pts
## Univariate analysis

<table>
<thead>
<tr>
<th></th>
<th>Spasm</th>
<th></th>
<th>P value</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Yes (n=192)</td>
<td>No (n=357)</td>
<td></td>
</tr>
<tr>
<td>Age (yr)</td>
<td>56.9 ± 11.2</td>
<td>55.9 ± 12.4</td>
<td>0.086</td>
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<tr>
<td>Male (%)</td>
<td>83 (43.2%)</td>
<td>178 (49.9%)</td>
<td>0.138</td>
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<td>HTN (%)</td>
<td>74 (38.5%)</td>
<td>145 (40.6%)</td>
<td>0.636</td>
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<td>DM (%)</td>
<td>18 (9.4%)</td>
<td>54 (15.1%)</td>
<td>0.057</td>
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## Univariate analysis

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<tbody>
<tr>
<td></td>
<td>Yes (n=192)</td>
</tr>
<tr>
<td>Smoking(%)</td>
<td>41(21.4%)</td>
</tr>
<tr>
<td>Cr(mg/dL)</td>
<td>0.87 ± 0.24</td>
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<tr>
<td>Glucose(mg/dL)</td>
<td>102.5 ± 22.8</td>
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<td>BNP(pg/mL)</td>
<td>146.2 ± 362.8</td>
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<th>No (n=357)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-chol (mg/dL)</td>
<td>167.5±43.7</td>
<td>174.2±37.3</td>
<td>0.221</td>
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<tr>
<td>TG (mg/dL)</td>
<td>121.5±68.9</td>
<td>128.6±88.3</td>
<td>0.036</td>
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<tr>
<td>HDL (mg/dL)</td>
<td>50.3±13.8</td>
<td>50.9±13.6</td>
<td>0.764</td>
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<tr>
<td>LDL (mg/dL)</td>
<td>111.0±32.5</td>
<td>116.3±61.9</td>
<td>0.395</td>
</tr>
</tbody>
</table>
Univariate analysis

![Bar chart showing univariate analysis results for age, male, HTN, DM, and smoking. The chart compares spasm and control groups.](chart.png)
Univariate analysis

* : $P \leq 0.05$
Multivariate analysis

Odd ratio

all: no significant
Conclusion

• There is no significant association between BNP and vasospastic angina

• Our finding suggest that vasospastic angina with normal LV systolic function did not associated with LV wall stress.

→ BNP level is not useful in diagnosis, treatment and prognosis in vasospastic angina
• Thank you for your attention