Sincope e bradicardia sinusale: quale è la terapia appropriata?

Paolo Alboni, Cento

Key points:
• 1- Fisiopatologia della sincope nei pz con BS
• 2- Diagnosi del tipo of sincope nei pz con BS
• 3- Trattamento della syncope nei pz con BS
The sick sinus syndrome is a descriptive term to refer to a constellation of signs and symptoms defining SN dysfunction in a clinical setting.
SICK SINUS SYNDROME

Signs + Symptoms

↑

Physical exam.
ECG

↑

History

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SICK SINUS SYNDROME

ECG signs

Diurnal sinus bradycardia (SR < 50 beats/min)

Diurnal sinoatrial blocks or sinus pauses
SICK SINUS SYNDROME

Symptoms

Peripheral hypoperfusion  Cerebral hypoperfusion

- Fatigue
- Effort dyspnea
- Dizziness
- Presyncope
- Syncope
- Irritability
SICK SINUS SYNDROME

Diagnosis

Definite SSS
When a clear cause/effect relationship between ECG abnormalities and symptoms can be established (by means of standard ECG or ECG monitoring)

Possible SSS
When such a relationship is not demonstrated, but severe signs of SN dysfunction are present (sinus bradycardia < 40 beats/min, repetitive diurnal SA blocks or diurnal sinus pauses > 3 s, prolonged CSNRT)
Natural history of sick sinus syndrome
FIG 1—Observed survival curves for patients with sinoatrial disorder (group 1; ×---×) and bradycardia (group 2; △----△) and estimated survival curve for normal population of similar age and sex distribution (○—○).
SSS and syncope

Total mortality and sudden death rates were similar in unpaced patients with SSS, with and without presyncope or syncope

Shaw DB et al, BMJ 1980
SSS and syncope

- In patients with SSS, the course of syncopal recurrences is unpredictable and very variable

- In retrospective studies, syncope did not reappear for some years in 30-40% of subjects

Baldi N et al, Piccin Ed 1979
Gann D et al, Ann Intern Med 1979
Sasaki Y et al, Pace 1988
THEOPACE STUDY

Patients with symptomatic SSS (107)

- No treatment (35 pts)
- Pacemaker (36 pts)
- Theophylline (36 pts)

Followed for up to 48 months (mean 19±14)

Alboni P et al, Circulation 1997
SSS and syncope

THEOPACE study
“No treatment” group

Recurrence rate of syncope

<table>
<thead>
<tr>
<th>1 yr</th>
<th>4 yrs</th>
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<tbody>
<tr>
<td>28%</td>
<td>46%</td>
</tr>
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</table>

Alboni P et al, Circulation 1997
Menozzi C et al, Am J Cardiol 1998
Pathophysiology of syncope in patients with sinus bradycardia
### Positive responses to tilt test and CSM

<table>
<thead>
<tr>
<th>Development of syncope</th>
<th>SSS and syncope (35)</th>
<th>Uncertain syncope (35)</th>
<th>Control subjects (35)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tilt test</td>
<td>19 (54%)</td>
<td>9 (26%) +</td>
<td>2 (6%) *</td>
</tr>
<tr>
<td>CSM</td>
<td>21 (60%)</td>
<td>22 (63%)</td>
<td>1 (3%) *</td>
</tr>
</tbody>
</table>

*Comparison between control and SSS groups, p< 0.05
+Comparison between SSS and uncertain groups, p< 0.05

Brignole M et al, Am J Cardiol 1991
Group I
SB and syncope (25 pts)

Group II
SB without neurologic symptoms (25 pts)

- Holter
- ES (before and after autonomic blockade)
- Tilt test
- CSM

Alboni P et al, J Am Coll Cardiol 1993
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SINUS BRADYCARDIA

Pts with syncope (25) versus pts without syncope (25)

Clinical characteristics
- Resting sinus rate
- Holter monitoring data
- Basal CSNRT
- Intrinsic CSNRT

Similar in the two groups

Alboni P et al, J Am Coll Cardiol 1993
## SINUS Bradycardia

Positive responses to tilt test and CSM

<table>
<thead>
<tr>
<th>Development of syncope</th>
<th>SB and syncope</th>
<th>SB without neurologic symptoms</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(25 pts)</td>
<td>(25 pts)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSM</td>
<td>11 (44%)</td>
<td>6 (24%)</td>
<td>NS</td>
</tr>
<tr>
<td>Tilt test</td>
<td>15 (60%)</td>
<td>3 (12%)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Alboni P et al, J Am Coll Cardiol 1993
The difference in percent of positive tilt testing results in the two groups of patients was independent of the prevalence of intrinsic SN dysfunction and severity of sinus bradycardia (Mantel-Haenszel test, p=0.05).

Alboni P et al, J Am Coll Cardiol 1993
Pathophysiology of syncope in subjects with sinus bradycardia

These results show that, at least in the majority of cases, a subject with sinus bradycardia is symptomatic for syncope, when he/she is affected with an abnormal neural reflex in addition to SN dysfunction. These results can explain why the course of syncopal recurrences is unpredictable in subjects with sinus bradycardia and why syncope has not prognostic relevance.
Post - tachycardia cardiac pause
SINUS BRADICARDIA AND SYNCOPE

Diagnostic implications
SINUS BRADYCARDIA AND SYNCOPE

Causes of syncope

Neural reflex

Very depressed sinus automaticity

All the potential causes of syncope
SINUS BRADYCARDIA AND SYNCOPE

Examinations

Reflex syncope

Positive tilt test
Positive CSM?

Syncope secondary to depressed SN automaticity

CSNRT > 800 during ES
Diurnal asymptomatic cardiac pauses > 3 s
(during ECG monitoring)?

Brignole M et al, Am J Cardiol 1991
Alboni P et al, J Am Coll Cardiol 1993
Alboni P et al, Circulation 1997
Menozzi C et al, Am J Cardiol 1998
Sinus pause likely secondary to depressed SN automaticity
Vagally mediated sinus pause
SINUS BRADYCARDIA AND SYNCOPE

Therapeutic implications
Recommendations for cardiac pacing in SN dysfunction and syncope

Class I Evidence

Sinus node dysfunction with documented symptomatic bradycardia, including frequent sinus pauses that produce symptoms

ACC/AHA/HRS Guidelines, Circulation 2008
# Recommendations for cardiac pacing in SN dysfunction and syncope

## Class I Evidence

| Syncope with sinus node disease, either spontaneously occurring or induced at electrophysiological study | C |

## Class IIa

| Syncope for which no other explanation can be made but there are abnormal electrophysiological findings (CSNRT > 800 ms) | C |

ESC Guidelines, Europace 2007
SINUS BRADYCARDIA AND SYNCOPE

THEOPACE study

Occurrence of syncope in the “no treatment” group of symptomatic SSS pts

At multivariate analysis, a CSNRT > 800 ms was an independent predictor of occurrence of syncope

Alboni P et al, Circulation 1997
Menozzi C et al, Am J Cardiol 1998
“No treatment” group with symptomatic SSS

SINUS BRADYCARDIA AND SYNCOPE

Indications to PM implantation, without performing HUT and ES

- Frequent syncopal episodes
- Syncope with major trauma
- Episodes of heart failure
- Symptomatic chronotropic incompetence (fatigue, effort dyspnea)
- Brady-tachy syndrome (requiring AA drugs)?
- Diurnal cardiac pauses > 3 s (during ECG monitoring)?
SINUS BRADYCARDIA AND SYNCOPE

- Isolated or very rare syncopal episodes without major trauma
  - Particularly if the patient is young or middle-aged
- No other SSS symptoms

Tilt test
Electrophysiologic study
SINUS BRADYCARDIA AND SYNCOPE

Tilting test positive → Treat VVS (counseling, counterpressure manoeuvres, etc.)

CSNRT > 800 ms → PM implantation
SINUS BRADYCARDIA AND SYNCOPE

Pacemaker implantation

DDD (or DDDR)

No AAI (or AAIR)
Perspective

A prospective study utilizing the ILR in selected subjects with sinus bradycardia and syncope

It could be possible to evaluate whether tilt testing and electrophysiologic study can predict a vagally mediated syncope or a syncope secondary to depressed sinus automaticity.