Management of Cardioinhibitory Syncope: to Pace or not to Pace

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Syncope

- Syncope is a T-LOC due to transient global cerebral hypoperfusion characterized by
- rapid onset,
- short duration, and
- spontaneous complete recovery.

Reflex (neurally-mediated) syncope

Vasovagal:

- *mediated by emotional distress: fear, pain, instrumentation, blood phobia*
- *mediated by orthostatic stress*

Situational:

- *cough, sneeze*
- *gastrointestinal stimulation (swallow, defaecation, visceral pain)*
- *micturition (post-micturition)*
- *post-exercise*
- *post-prandial*
- *others (e.g., laught, brass instrument playing, weightlifting)*

Carotid sinus syncope

Atypical forms (without apparent triggers and/or atypical presentation)

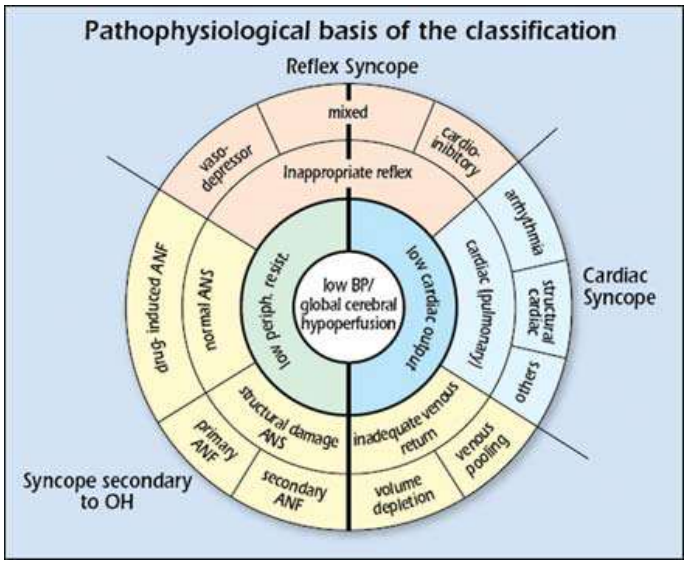


Figure 2: Schematic diagram of hemodynamic cascade:

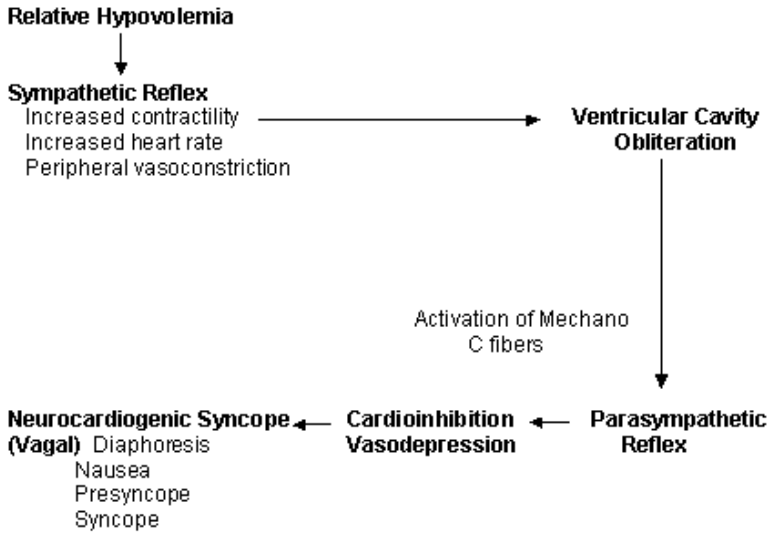
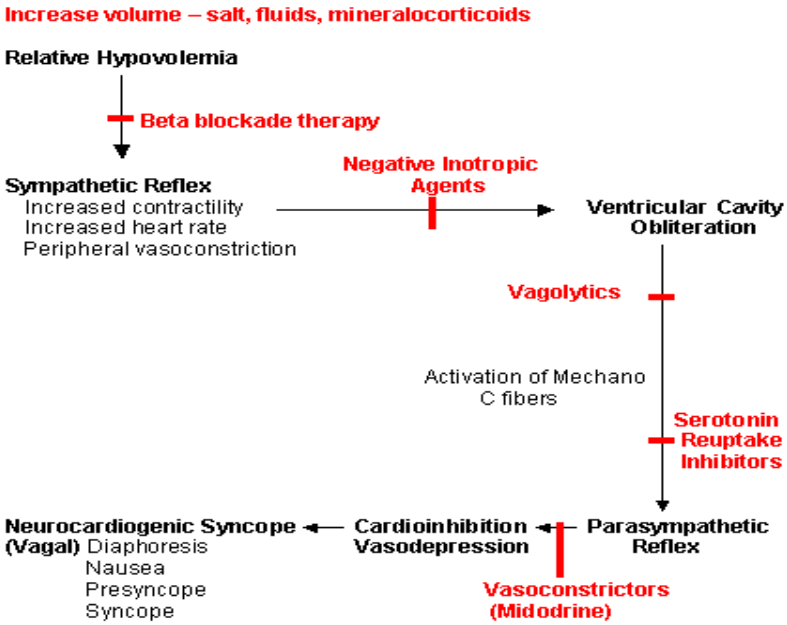


Figure 3: Pharmacologic interventions



Recommendations: treatment of reflex syncope

Recommendations	Class*	Level†
• Explanation of the diagnosis, provision of reassurance, and explanation of risk of recurrence are indicated in all patients	I	C
• Isometric PCMs are indicated in patients with prodrome	I	B
• Cardiac pacing should be considered in patients with dominant cardioinhibitory CSS	IIa	B
• Cardiac pacing should be considered in patients with frequent recurrent reflex syncope, age >40 years, and documented spontaneous cardioinhibitory response during monitoring	IIa	B
• Midodrine may be indicated in patients with VVS refractory to lifestyle measures	IIb	B
• Tilt training may be useful for education of patients but long-term benefit depends on compliance	IIb	B
• Cardiac pacing may be indicated in patients with tilt-induced cardioinhibitory response with recurrent frequent unpredictable syncope and age >40 after alternative therapy has failed	IIb	C
• Cardiac pacing is not indicated in the absence of a documented cardioinhibitory reflex	III	C
• β-Adrenergic blocking drugs are not indicated	III	A

Carotid Sinus Syncope

- 10 sec. of massage
- supine and erect
- pacing (dual chamber) is indicated when >6 sec. asystole occurs with reproduction of syncope.

- The decision to implant a PM should be kept in the context of a relatively benign condition, with the aim of preventing traumatic recurrences, which are frequent in old patients with recurrent carotid sinus syncope.

Indication for cardiac pacing in patients with undocumented reflex syncope

Recommendations	Class [a]	Level [b]	Ref. [c]
1) Carotid sinus syncope. Pacing is indicated in patients with dominant cardioinhibitory carotid sinus syndrome and recurrent unpredictable syncope.	I	B	35–40

Choice of pacing mode

Recommendations	Class [a]	Level [b]	Ref. [c]
4) Carotid sinus syncope. In patients with carotid sinus syndrome, dual-chamber pacing is the preferred mode of pacing.	I	B	41–43

- ***Despite the lack of large RCTs, the review of the literature supports the benefit of cardiac pacing in patients affected by carotid sinus syncope. A large randomized trial would be unlikely to change this knowledge.***

Tilt Induced Vasovagal Syncope

- Typically, the vasovagal reflex induced during tilt table testing is both hypotensive and bradycardic.
- there is no role of pacing in preventing vasodilatation and hypotension.
- The lack of reproducibility of tilt testing limits its utility as a means of assessing therapy.
- the mechanism of tilt-induced syncope is frequently different from that of the spontaneous syncope recorded with the ILR

Clinical experience with pacemaker treatment for vasovagal syncope before the randomized clinical trial (RCT) era

- Sra et al. 1993, Petersen et al. 1994, Benditt et al. 1997 demonstrated the efficacy of pacemaker treatment for preventing or reducing VVS.
- All 3 trials were retro-spective and uncontrolled.

The era of RCTs: is pacemaker efficacy due to a placebo effect?

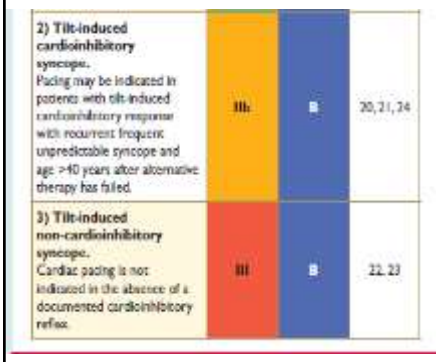
- In the Second Vasovagal Pacemaker Study (VPS II) 2003, 100 patients were assigned to receive DDD pacing with RDR or to have only sensing without pacing (ODO).
- In the vasovagal SYNcope and PACing (SYNPACE) 2004 trial, 29 patients with severe recurrent tilt-induced VVS underwent DDD-RDR pacemaker implantation and were randomized to pacemaker ON or pacemaker OFF.

- These 2 double-blind RCTs failed to prove the superiority of cardiac pacing over placebo in patients affected by VVS.
- These 2 trials included patients with VVS of not only the cardioinhibitory type but also the vasodepressor and mixed types.
- Could pacing therapy be effective for the cardioinhibitory type of VVS, specifically that with a prolonged asystole?

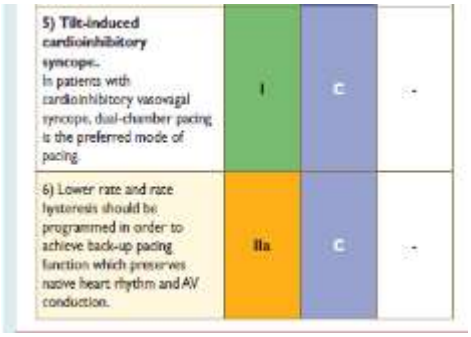
Reappraisal of pacing therapy for vasovagal syncope: ISSUE 3

- ILR revealed that patients with a tilt-induced asystole did not always have bradycardia or asystole during the recurrent episodes of syncope.
- ISSUE 3 was a double-blind, randomized placebo-controlled study conducted in 29 centers in Europe and Canada, all Pts was ≥ 40 ys

- 77 Pts with documented asystole in ILR were randomized to DDD with RDR, or to sensing only (pacemaker off).
- The ISSUE 3 study (reported in 2012) demonstrated that pacemaker therapy is effective in preventing the recurrence of syncope for selected VVS patients who had cardioinhibitory response documented by ILR.
- The role of pacemaker treatment for young (age≤ 40 years) VVS patients remains to be established.



2) Tilt-induced cardioinhibitory syncope. Pacing may be indicated in patients with tilt-induced cardioinhibitory response with recurrent frequent unpredictable syncope and age >40 years after alternative therapy has failed.	IIb	B	20, 21, 24
3) Tilt-induced non-cardioinhibitory syncope. Cardiac pacing is not indicated in the absence of a documented cardioinhibitory reflex.	III	B	22, 23



5) Tilt-induced cardioinhibitory syncope. In patients with cardioinhibitory vasovagal syncope, dual-chamber pacing is the preferred mode of pacing	I	C	-
6) Lower rate and rate hysteresis should be programmed in order to achieve back-up pacing function which preserves native heart rhythm and AV conduction.	IIa	C	-

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• β-Adrenergic blocking drugs are not indicated	III	A

Pacing Algorithm

- DDD with Rate Drop Response.

Take Home Message

- VVS is usually a benign condition.
- Pacing Is used in Selected Cases to ***REDUCE RECURRENCE*** of syncope.

THANK YOU