Use of Sublingual Nitroglycerin: Have We Forgotten the Basics?

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CLINICAL INTEREST
- 29 years - cardiology nurse
- 13 years - hospital cardiology
- 16 years - nurse practitioner - ambulatory cardiology
- DNP Study - clinically relevant
  - Nitro: Why Aren't We Prescribing It?
    - SLNTG prescribing "might be a good target for a global practice-improvement initiative" (Walton-Shirley, 2014, p. 1).
  - Who needs it?
  - Who should get it?
  - How to take it?
  - When to refill it?
  - When not to take it?
1. The learner will be able to describe the impact of angina on patients seen in clinical practice:
   - Disease: what is angina
   - Prevalence: US, Office Visits
   - Angina: affects quality of life, long-term anxiety, depression, and functional capacity
   - Costs re: patients with CAD (with angina).

2. The learner will be able to review the 2012 and 2014 AHA/ACC Guideline for the Diagnosis and Management of Stable Ischemic Heart Disease (Specifically, the Guideline Directed Medical Therapy):
   - SLNTG

3. The learner will be able to describe the four areas of patients' deficits in the use of SLNTG for the self-management of angina:
   - SLNTG as premedication for effort-induced angina
   - SLNTG and the use of phosphodiesterase inhibitors
   - Dosing intervals for the use of SLNTG
   - Replacement of SLNTG

4. The learner will be able to describe the use of a chest pain action plan

OBJECTIVES:
OBJECTIVE
1. The learner will be able to describe the impact of angina on patients seen in clinical practice:
   • Disease – what is angina
   • Prevalence – US, Office Visits
   • Angina – affects:
     • Quality of life
     • Long-term anxiety
     • Depression
     • Functional capacity
   • Costs re: patients with CAD (with angina).

ANGINA – WHAT IT IS.
Angina (aka, stable ischemic heart disease (SIHD); chronic stable angina (CSA))

TYPICAL ANGINA:
• Discomfort (pressure, tightness, heaviness, fullness)
• Location: Midsternal/substernal/retrosternal
• Precipitated by: exertion/emotional distress
• Relieved by: rest and/or NTG tab / spray
• Other sites – see image

ATYPICAL SYMPTOMS:
• Fatigue
• Indigestion
• Lightheadedness
• Nausea
• Dyspnea
• Weakness
• +/- chest pain/pressure
• More common in women

https://www.youtube.com/watch?v=NK9HXu9g5qA
THE IMPACT of ANGINA: Prevalence

- CAD – leading cause of death
  - Initial manifestation: angina (Camm et al., 2015)
  - 1 in 3 - CVD
  - 17 million - CHD
  - 10 million - angina (Fihn et al., 2012; Go et al., 2014; Mozaffarian, 2016)
  - Lifetime risk of developing CAD after 40
    - 32% for women
    - 49% in men (Tobin, 2010)

- 1 / 5 patients w/ intensive treatment for MI - angina 1 year later (Fihn et al., 2012).

- Patients’ perception of angina vs.
  - Providers’ perception that pt having angina

CADENCE (Coronary Artery Disease in General Practice) study (Beltrame, Weekes, Morgan, Tavella, & Spertus, 2009)

CANADIAN CARDIOVASCULAR SOCIETY GRADING OF ANGINA PECTORIS

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade I</td>
<td>Ordinary physical activity does not cause angina, such as walking and climbing one flight of stairs without discomfort.</td>
</tr>
<tr>
<td>Grade II</td>
<td>Slight limitation of ordinary activity. Walking or climbing stairs rapidly, walking uphill, working or ever climbing after meals, or in cold, in heat, or under emotional stress, or only during the few hours after awakening. Walking more than two blocks on the level and normal tolerance of work is usual.</td>
</tr>
<tr>
<td>Grade III</td>
<td>Marked limitation of ordinary physical activity. Walking one or two blocks on the level and climbing one flight of stairs in normal conditions and at normal pace.</td>
</tr>
<tr>
<td>Grade IV</td>
<td>Inability to carry on any physical activity without discomfort. Anginal syndrome may be present at rest.</td>
</tr>
</tbody>
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References:
- Available on the Canadian Cardiovascular Society Website at www.ccs.ca

ONLINE VERSION OF SAQ: MYHEALTHOUTCOMES.COM

Melinda’s SAQ Results From 01/24/2016 — Back to SAQ Trends

Numerical Results

Graphical Results

http://myhealthoutcomes.com/

SPEAK FROM THE HEART (WEBSITE)

https://www.speakfromtheheart.com/angina-tools/angina-checklist

THE IMPACT of ANGINA: Quality of Life (QoL)

• Patients CSA - decreased QoL (Fihn et al., 2012).

• CADENCE study:
  • Weekly or daily angina - lower scores on the SAQ - worse QoL
  • compared

  • Minimal angina (< less than 1 X / week over prior 4 weeks; Beltrame, Weeks, Morgan, Cavele, & Speriana, 2009)

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THE IMPACT of ANGINA ...

• Long-term anxiety, depression, and impaired physical function (Jesperson, Albidldstrom, Hwvelplund & Prescott, 2013)
  - Higher prevalence of persistent angina in patient with diffuse non-obstructive CAD or normal coronary arteries than those with obstructive CAD.

Patients with persistent angina were:
• More depressed
• More anxious
• More physically limited

THE IMPACT of ANGINA: INCREASE UTILIZATION of HEALTHCARE RESOURCES

• Direct/indirect costs for CVA/Stroke: $315 billion (Go, et al., 2014)

• Cost due to:
  • ED visit
  • Clinic visit
  • Revascularization procedures
  • Pharmacy costs (Kempt, Buysman, & Brixner, 2011).

• MERLIN-TIMI 36 trial
  • stable angina frequency & resource utilization - 5460 stable outpatients
  • SAQ 4 months after ACS
  • followed - additional 8 months (Hausdorff et al., 2009)

• Pts without angina - $2982
  • Monthly angina: $4000
  • Weekly angina: $4500
  • Daily angina: $7000

Increased costs - recurrent hospitalizations & revascularizations
**SELF-MANAGEMENT of ANGINA**

**Literature suggests:**

- Sublingual NTG (SLNTG) is a mainstay for self-management of angina ([Fihn et al., 2012]).
- Discordance between guideline recommendations & actual practice in prescribing SLNTG ([Gallagher et al., 2010; Zevin et al., 2004]).
- Opportunities for further education with patients in the use of SLNTG ([Gallagher et al., 2010; Zevin et al., 2004]).

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**OBJECTIVE**

2. The learner will be able to review the 2012 and 2014 AHA/ACC Guideline for the Diagnosis and Management of Stable Ischemic Heart Disease (Specifically, the Guideline Directed Medical Therapy):

- SLNTG
MAIN GOALS - TREATING SIHD PATIENT:

Specifically ....

- Minimize death
- Maximizing health & function.

- Reduce premature CV death
- Prevent complications
- Maintain / restore -
  - Level of activity
  - Functional capacity
  - Satisfactory QoL – as defined by patient
- Eliminate ischemic symptoms.
- Minimize costs of health care

These goals can be achieved w/ 5 strategies:

- Educate patients
- Identify and treat conditions
- Modify risk factors
- Use evidence-based pharmacological treatment
- Use of revascularization / PCI or CABG when indicated to improve patient’s health status & survival.

Life’s Simple 7

1. Control Cholesterol
2. Eat Better
3. Lose Weight
4. Get Active
5. Manage Blood Pressure
6. Reduce Blood Sugar
7. Stop Smoking

http://www.heart.org/HEARTORG/Conditions/My-Life-Check---Lifes-Simple-7_UCM_471453_Article.jsp#.VqPZPPkrLIU
PATIENT EDUCATION ...

**CLASS I (should include): recommendation re: patient education**

1. Individualized education plan to include:
   a. Medication adherence
   b. Medication management & CV risk reduction
   c. Review therapeutic options
   d. Appropriate exercise
   e. Self-monitoring skills
   f. Recognition of worsening CV symptoms & and appropriate actions to take.

2. Patients w/ SIHD should be educated about these lifestyle elements – see Simple 7 elements.

(Fihn et al., 2009)

PATIENT EDUCATION ...

**CLASS IIa (reasonable to include): Education Recommendations include:**

a. Diet education.
b. Recognition of stress and depression
c. Behavioral mgmt. of stress and depression
d. Evaluation & treatment of major depressive disorders when indicated.

(Fihn et al., 2009)
GUIDEINE DIRECTED MEDICAL THERAPY (GDMT)

The Guidelines

2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS Guideline for the Diagnosis and Management of Patients With Stable Ischemic Heart Disease

Figure 2: Algorithm for Guideline-Directed Medical Therapy for Patients With Stable IHD

Fihn et al, 2009, p. e57
The Guidelines

No additions re: the use of SLNTG found in the 2014 Guidelines.

All patients with SIHD should be prescribed sublingual nitroglycerin tablets or spray for immediate relief of angina in patients with SIHD (843-845). (Level B)

4.4.3.4. USE OF ANTIANGUINE MEDICATIONS: RECOMMENDATIONS

The Guidelines

2012 ACCF/AHA/ACP/ATS/PCNA/SCAI/STS Guideline for the Diagnosis and Management of Patients With Stable Ischemic Heart Disease

Sublingual nitroglycerin or nitroglycerin spray is recommended for immediate relief of angina in patients with SIHD (843-845). (Level B)

4.4.3. Medical Therapy for Relief of Symptoms

Nitroglycerin use ... Since 1879
3. The learner will be able to describe the four areas of patients’ deficits in the use of SLNTG for the self-management of angina:

- SLNTG - premedication - effort-induced angina
- SLNTG - phosphodiesterase inhibitors
- Dosing intervals - SLNTG
- Replacement - SLNTG
FOUR THEMES IDENTIFIED

1. SLNTG - premedication - effort-induced angina  
   (Fan et al., 2009)
   - Straight from the Guideline: “effective for prevention of effort-induced angina when administered 5-10 minutes before activity, w/ relief lasting approximately 30-40 minutes” (Fihn et al., 2012, p. e102).
   - Fan et al.’s (2009) improve SLNTG knowledge - provide self-manage angina
     - Only 24% of participants knew they could use SLNTG to prevent activity-related chest pain.
   - Gallagher and Colleagues (2010)
     - Estimates of 15-37% of patients with suspected or confirmed diagnosis of coronary artery disease (CAD) - no prescription - SLNTG
     - 43% - SLNTG education - Nursing provided (37%)
     - Lacked knowledge - SLNTG pre-medicating prevent CP

FOUR THEMES IDENTIFIED

2. SLNTG and the use of phosphodiesterase inhibitors  
   (Fihn et al., 2012; Gallagher et al., 2010)
   - Co-administration - sildenafil, tadalafil, or vardenafil - avoided altogether w/ long-acting nitrate (LAN; such as lindur) administration
     - 24 hrs - after sildenafil (Viagra)
     - 48 hrs - after tadalafil (Cialis) - SLNTG
     - Unsure - time interval after vardenafil (Levitra) has not been determined (Fihn et al., 2012, p. e102)
   - Gallagher et al., 2010: 12% - participants - sildenafil
     - 33 % - knew - SLNTG should not be used concurrently
     - 75 % - knew - use - SLNTG concurrently - nitroglycerin patches

JACK NICHOLAS – VIAGRA SCENE
FOUR THEMES IDENTIFIED

3. Dosing intervals for the use of SLNTG
   (Fihn et al., 2012; Fan et al., 2009; Gallagher et al., 2010, 2013)
   • 2012 Guidelines: suggest up to 3 SLNTG before calling EMS. (Fihn et al., 2012, p. e102).
   • 2013 STEMI Guidelines: suggest calling EMS after first NTG – delays getting help (O’Gara et al., 2013, Rosenberg, 2005)
   • Fan et al. (2009):
     • 56% reported no ongoing education – SLNTG
     • ~48% did not know the correct dosing sequence – SLNTG.
   • Gallagher 2010 and 2013
     • 2010: ~70% knew the correct sequence of dosing and/or maximum dosage per episode
     • 2013: only 50% knew the recommended doses of SLNTG, even after the standard educational intervention and that NTP could be used together.

FOUR THEMES IDENTIFIED

4. Replacement of SLNTG
   (Fihn et al., 2012, Gallagher et al., 2010; Zimmerman et al., 2000)
   • 2012 SHHD Guideline:
     • Keep in original bottle
     • Keep cool/dry (not refrigerated)
     • Do NOT use after 6–12 months after opening
   • Gallagher et al. (2010):
     • 67% knew to keep the SLNTG in its original container
     • 51% knew when the SLNTG would expire.
   • Zimmerman et al. (2000):
     • 38% of the participants did not have a prescription for SLNTG
     • 23% of patients with SLNTG had tablets that were at least one year old.
4. The learner will be able to describe the use of a chest pain action plan

**References**


References

