Effectiveness of Nurse Led Clinics in Controlling Cardiovascular Risk Factors

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Saudi Heart Association

22nd Annual Symposium

Riyadh, 21st Feb. 2011

Disclosures: None
Disease Management Programs

- A combination of patient education, use of practice guidelines, appropriate consultation, and supplies of drugs and ancillary services.”1

- Increasingly advocated as a mean of improving management and outcomes for patients with coronary heart disease.1,2

Nurse Led Clinics

Several mechanisms to improve secondary prevention have been evaluated, of which the most successful to date has been nurse led secondary prevention clinics.  

Secondary Prevention

Aggressive comprehensive risk factor management:

1. Improves survival.

2. Reduces recurrent events and the need for interventional procedures.

3. Improves quality of life for patients with coronary and other atherosclerotic vascular disease.*

Coronary Artery Disease (CAD) in Saudi Arabia

- The overall prevalence of CAD in KSA is 5.5%. ¹

- The leading cause of admission to major hospitals was due to CAD. ²

Objective

- Evaluate the impact of a nurse-led cardiovascular disease management program (CVDMP) in controlling cardiovascular risk factors in patients with CAD.

- A secondary objective was to evaluate the adherence of utilizing evidence based CAD medications.
Cardiovascular Disease Management Program In KAMC (CVDMP)

- Established in year 2000.

- 4 programs:
  1. Heart failure
  2. Atherosclerosis
  3. Cardiac diabetes education
  4. Life style modification

- Nurse led, cardiologist supervised, and target oriented program.
CVDMP In KAMC continue ...

- Multidisciplinary team approach.

- Individualized, comprehensive management plans.

- Focus on patient’s self management and involvement of family members.

- In-patient and outpatient role

- Open door system of care.
Method

- A single center retrospective analysis of prospectively collected data

- Inclusion Criteria:
  - Adult patients who have documented CAD
  - Enrolled in CVDMP from June 2009 to September 2010.
  - Have at least one follow up visit after enrollment

- Exclusion criteria:
  - Patients who had no follow up data
Data Collection and Analysis

- Data was collected and entered in database during each clinic visit, and included:
  - Demographics
  - Risk factors
  - Laboratory results:
    - Low Density Lipoproteins (LDL)
    - High Density Lipoprotein (HDL)
    - Triglycerides
    - Glycated hemoglobin (HbA1c)
    - Fasting blood glucose
Data Collection and Analysis, continue ...

- Co-morbidities
- BP and HR
- Evidence based medications

- Data then examined and compared from enrollment and last follow up visits

- Mean follow up 7.4 months ± 4.0
Statistical analysis

- Conducted by using SPSS version 16
- Descriptive statistics were used to describe data
- Categorical variables reported as frequencies and percentages, and analyzed using Pearson’s chi-square tests, or Fisher’s exact tests
- Continuous variables presented as means and SD, and analysis conducted using Student’s t-test
## Baseline characteristics

<table>
<thead>
<tr>
<th>Baseline characteristics</th>
<th>N= 332 patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean ± SD, years</td>
<td>60 ± 10</td>
</tr>
<tr>
<td>Female %</td>
<td>22.2</td>
</tr>
<tr>
<td>DM %</td>
<td>70</td>
</tr>
<tr>
<td>HTN %</td>
<td>71.2</td>
</tr>
<tr>
<td>Smoking: Active%</td>
<td>9.9</td>
</tr>
<tr>
<td>Quit&lt;5 yrs %</td>
<td>12.9</td>
</tr>
<tr>
<td>Quit &gt;5 yrs %</td>
<td>21.3</td>
</tr>
<tr>
<td>Never smoke%</td>
<td>55.9</td>
</tr>
<tr>
<td>PCI %</td>
<td>56.2</td>
</tr>
<tr>
<td>CABG %</td>
<td>32.4</td>
</tr>
<tr>
<td>Medical Rx only %</td>
<td>19.5</td>
</tr>
</tbody>
</table>
### Risk Factor’s Means Comparison

<table>
<thead>
<tr>
<th>Mean</th>
<th>Enrollment N = 332</th>
<th>Follow up N = 332</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR bpm ± std</td>
<td>69 ±10</td>
<td>68 ±9</td>
<td>0.74</td>
</tr>
<tr>
<td>SBP mmHg ± std</td>
<td>132 ±22</td>
<td>128 ±16</td>
<td>0.01</td>
</tr>
<tr>
<td>DBP mmHg ± std</td>
<td>75 ±12</td>
<td>76 ±8</td>
<td>0.58</td>
</tr>
<tr>
<td>LDL mmol/L ± std</td>
<td>2.31 ±0.81</td>
<td>2.00 ±0.74</td>
<td>0.05</td>
</tr>
<tr>
<td>HDL mmol/L ± std</td>
<td>0.91 ±0.20</td>
<td>0.87 ±0.21</td>
<td>0.21</td>
</tr>
<tr>
<td>Triglycerides mmol/L ± std</td>
<td>1.75 ±1.31</td>
<td>1.68 ±0.90</td>
<td>0.24</td>
</tr>
</tbody>
</table>
Systolic Blood Pressure to Target

- Enrollment: 71%
- Follow up: 78%

P 0.03

SBP ≤ 140 mmHg
LDL-C to Target

- LDL≤ 1.8 mmol/L
  - Enrollment: 31%
  - Follow up: 40%
  - P = 0.044

- LDL≤ 2.5 mmol/L
  - Enrollment: 67%
  - Follow up: 80%
  - P = 0.032
HDL, Triglycerides and HR Targets

- HDL>1 mmol
- Trig.<1.5 mmol
- HR <74 bpm

P 0.61  P 0.49  P 0.43
Utilization of Efficacious Medications

- Beta Blockers: P = 0.5
- Aspirin: P = 0.34
- Statins: P = 1
Why Not on Evidence Based Medication

Atherosclerosis Window

Collective Cardiac Risk Factors:

- Hypertension
- Dyslipidemia
- Smoker
- Male > 65 yrs.
- Diabetes Mellitus
- Obesity BMI > 30 kg/m²
- FH of Premature CAD age < 55 yrs.
- Metabolic Syndrome

Sleep Apnea
Homocysteine
Others
Physical Inactivity < 30min.
Post Menopause
Oophorectomy
Hormone Replacement

Primary/Secondary Prevention Medication:

- Acetylsalicylic Acid
- Intolerance to Aspirin
- Taking NSAID
- Active bleeding other than GI
- Patient refuses
- Beta-blocker
- Intolerance to Beta-Blocker
- Systolic BP<60mmHg
- Bradycardia (Heart Rate<60/min not on Beta-Blocker therapy)
- PR interval>0.24 secs on ECG
- Bifascicular block on ECG
- Lipid lowering medication
- Acute liver disease
- Persistent elevations of serum transaminases
- Pregnancy
- ACEI

Close
DM Prevalence in CAD

- 70% DM
- 30% No DM
Hypertension Prevalence Among DM Patients

- 24% No HTN
- 76% HTN
Diabetes Control

P 0.012
LDL–C to Target in DM Patients

- LDL<1.8:
  - Enrollment: 29%
  - Follow up: 39%
  - P < 0.009

- LDL<2.5:
  - Enrollment: 67%
  - Follow up: 82%
  - P 0.0001
SBP to Target in DM Patients

P < 0.000

- Enrollment: 62%
- Follow Up: 78%

SBP < 140 mmHg
Conclusion

- Nurse-led CVDMPs have a significant impact on controlling cardiovascular risk factors in patients with CAD.

- Utilization of evidence based CAD medications is optimal even at enrollment, which may reflect the overall improvement in the center quality of care, in addition to the in patient CVDMP nurses role.
Future Study

- Measure the CAD outcomes of nurse led CVDMP i.e. mortality, revascularization, rehospitalizations, cardiac events, etc…
Thank You
Evidence Based Medication (old study in 2008, N=57) Before Implementing the In-Patient Nurse Specialist’s Role.

<table>
<thead>
<tr>
<th>Medication</th>
<th>Enr</th>
<th>6 months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB</td>
<td>92%</td>
<td>96%</td>
<td>93.2%</td>
</tr>
<tr>
<td>ACEI</td>
<td>62</td>
<td>76</td>
<td>70.5</td>
</tr>
<tr>
<td>ARBs</td>
<td>22</td>
<td>22</td>
<td>22.7</td>
</tr>
<tr>
<td>Statin</td>
<td>98</td>
<td>100</td>
<td>98</td>
</tr>
<tr>
<td>Aspirin</td>
<td>98</td>
<td>98</td>
<td>98</td>
</tr>
<tr>
<td>Plavix</td>
<td>70</td>
<td>70</td>
<td>63</td>
</tr>
</tbody>
</table>
Utilization of Essential Medications

- Prescription of beta blockers was 92% at enrollment and 90% at follow-up (P< 0.5), due to valid reasons.
- Utilization of lipid lowering agents was 97% with no change after follow up (P =1).
- Utilization of Aspirin was 99% at enrollment, and 98% at follow up (P=0.34)
Diabetes Control

Enrollment
- HbA1c>9%: 39% (P 0.040)
- HbA1c7-9%: 37% (P 0.012)
- HbA1c<7%: 24% (P 0.013)

Follow up
- HbA1c>9%: 18%
- HbA1c7-9%: 49%
- HbA1c<7%: 33%
HDL, the Difficult Target

P < 0.611

HDL > 1 mmol/L

31%  29%

Enrollment  Follow Up
HR to Target

- Enrollment: 78%
- Follow Up: 81%

P 0.430

HR < 74 bpm
HbA1c to Target

<table>
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<tr>
<th>HbA1c Level</th>
<th>Enr</th>
<th>Follow Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 7%</td>
<td>24%</td>
<td>43%</td>
</tr>
<tr>
<td>&lt; 8%</td>
<td>33%</td>
<td>60%</td>
</tr>
<tr>
<td>&lt; 9%</td>
<td>61%</td>
<td>82%</td>
</tr>
</tbody>
</table>

P < 0.0128

P < 0.0001
Smoking History

- Active smoker: 9.9%
- Never smoked: 55.9%
- Quit more than 5 yrs: 21.3%
- Quit less than 5 yrs: 21.3%
Triglycerides to Targets

P 0.485

48% 51%

Trig. < 1.5 mmol/L
### DM Patient’s Results

- 70% of the whole sample, n 233/332.
- 76% of the patients with DM were HTN.

<table>
<thead>
<tr>
<th></th>
<th>At Enr.</th>
<th>At FU</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c &lt; 7%</td>
<td>24%</td>
<td>33%</td>
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<tr>
<td>HbA1c &lt; 9%</td>
<td>61%</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>LDL &lt; 1.7 mmol/l</td>
<td>21%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>LDL &lt; 1.8 mmol/L</td>
<td>29%</td>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>LDL &lt; 2.5 mmol/L</td>
<td>67%</td>
<td>82%</td>
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Percentage of patients achieved the targets.