How to monitor Cholesterol and Blood coagulation?

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326 PHCL
Cholesterol
Self Monitoring Devices
Cholesterol overview
Major dietary sources of cholesterol

- Cheese
- Egg yolks
- Beef, poultry
- Fish, and shrimp
- Human breast milk
LDL and HDL Cholesterol: What's Bad and What's Good?

HDL
• known as “GOOD” cholesterol.
• Why? The **Higher** the better.

LDL
• known as “BAD” cholesterol.
• Why? The **Lower** the better.
Dyslipidemia

• Dyslipidemia means an abnormal amount of lipids, or fats, in the blood

• They may result in increased risk CVD and atherosclerosis
Hyperlipidemia in Saudi Arabia.


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Abstract

OBJECTIVE: To determine the prevalence of hyperlipidemia among Saudis of both genders in rural and urban communities.

METHODS: Selected Saudis in the age group of 30-70 years were studied over a 5-year period between 1995 and 2000 in Saudi Arabia. Data were obtained from history, physical examination, and analysis of fasting plasma lipids. The data were analyzed to classify individuals with hypercholesterolemia (HC) (total cholesterol > or =5.2 mmol/l), and hypertriglyceridemia (HT) (total triglycerides > or =1.69 mmol/l). Logistic regression analysis was performed to provide a risk assessment model and correlation with other coronary artery disease (CAD) risk factors.

RESULTS: The number of study samples included in the final analysis was 16,819. The prevalence of HC was 54% with mean cholesterol level of 5.4+/−1.52 mmol/l. Prevalence of HC among males was 54.9% and 53.2% for females, while 53.4% among urban Saudis and 55.3% for rural Saudis. Hypertriglyceridemia prevalence was 40.3% with mean triglycerides level of 1.8+/−1.29 mmol/l. Males had statistically significant higher HT prevalence of 47.6% compared to 33.7% in females (p<0.0001).

CONCLUSION: Hyperlipidemia is reaching higher prevalence rates in KSA. This finding may suggest that CAD will soon be a major health problem. Reduction in obesity by adopting healthier eating habits, and increasing physical activity are of considerable importance to our community.
Dyslipidemia

Hyperlipidemia

Hypercholesterolemia (no High TG)

Hypertriglyceridemia (High TG)

Hyperlipoproteinemia (High LDL only)

Hypolipidemia

Synonyms
Atherosclerosis
Normal levels

<table>
<thead>
<tr>
<th>Total Cholesterol Level</th>
<th>Total Cholesterol Category</th>
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<tbody>
<tr>
<td>Less than 200 mg/dL</td>
<td>Desirable</td>
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<tr>
<td>200-239 mg/dL</td>
<td>Borderline high</td>
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<tr>
<td>240 mg/dL and above</td>
<td>High</td>
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<table>
<thead>
<tr>
<th>LDL Cholesterol Level</th>
<th>LDL Cholesterol Category</th>
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<tr>
<td>Less than 100 mg/dL</td>
<td>Optimal</td>
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<tr>
<td>100-129 mg/dL</td>
<td>Near optimal/above optimal</td>
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<tr>
<td>130-159 mg/dL</td>
<td>Borderline high</td>
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<tr>
<td>160-189 mg/dL</td>
<td>High</td>
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<tr>
<td>190 mg/dL and above</td>
<td>Very high</td>
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<tr>
<th>HDL Cholesterol Level</th>
<th>HDL Cholesterol Category</th>
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<tr>
<td>Less than 40 mg/dL</td>
<td>A major risk factor for heart disease.</td>
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<tr>
<td>40 - 59 mg/dL</td>
<td>The higher, the better.</td>
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<tr>
<td>60 mg/dL and above</td>
<td>Considered protective against heart disease.</td>
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Screening

- Everyone age 20 and older should have a fasting "lipoprotein profile" every 5 years.

- Cholesterol should be checked more often than every 5 years if:
  - Your TC is $\geq 200$ mg/dL
  - men $>45$ yo or women $>50$ yo
  - Your HDL (good) cholesterol $<40$ mg/dL.
  - You have other risk factor for heart disease and stroke.
The Framingham Risk Score

- Used to estimate the chance that a person will develop cardiovascular disease within the next 5 or 10 years.

- Also, to determine who should be offered preventive drugs such as drugs to lower blood pressure and drugs to lower cholesterol levels.

- There are two Framingham Risk Scores, one for men and one for women

- Recommended every 3-5 years for men age >40 years and women >50 years.
- Low risk (<10% CHD risk at 10 years)
- Intermediate risk (10 to 20%)
- High risk (>20%)
Calculator: 10 year risk of developing cardiovascular disease in women (Patient information)

Input:

Age [yr] ✔
Systolic Blood Pressure [mmHg] ✔
Total Cholesterol [mg/dL] ✔
HDL Cholesterol [mg/dL] ✔
On blood pressure medication: No ✔
Cigarette smoker: No ✔
Diabetes present: No ✔

Results:

Risk [%] ✔
Reset form
The CardioChek® System
The Two-Minute Home Cholesterol Test

- Approved by the FDA in 1993, home cholesterol tests generally measure the total fat levels in your blood.
  - Relied on by physicians.
  - Easy to use; two buttons do it all
  - Results in two minutes or less
  - Portable, palm-sized
  - Large digital readout
  - Stores the last 30 results of each test.
The CardioChek® System

How to Use it?
Before testing

• The test is done after a 9-12 hour FAST without food, liquids or pills.
Home test kits
Patient counseling for Hyperlipidemia treatment

Lipitor® Counseling
Blood Coagulation
Self Monitoring Devices
Normal Blood clotting process
Thrombosis

- Formation of a blood clot (thrombus) inside a blood vessel, obstructing the flow of blood through the circulatory system causing cell death

- When a blood vessel is injured, the body uses platelets (thrombocytes) and fibrin to form a blood clot to prevent blood loss

- A clot that breaks free and begins to travel around the body is known as an embolus

- Thromboembolism is the combination of thrombosis and its main complication, embolism.
Classification

Venous Thrombosis
- Deep vein thrombosis (DVT)
- Pulmonary Embolism (PE)

Arterial Thrombosis
- Atherosclerosis
- Myocardial infarction
- Stroke
Venous Thromboembolism (VTE)

• VTE is manifested as:
  ➢ Deep venous thrombosis (DVT)
  ➢ Pulmonary embolism (PE).

How DVT Forms?

DVT and PE
• Risk factors for DVT
  • Family or personal history of clots
  • Immobility
  • Surgery
  • Malignancy
  • Smoking
  • Pregnancy
  • Oral contraceptives
  • Major medical illness

➢ The principal cause of pulmonary embolism is DVT.

• Symptoms of DVT
  • Leg swelling, pain, warmth, and erythema (calf or thigh)
Management

• Anticoagulants = Blood thinners
  - Heparin (IV)
  - LMWH (SC)
  - Warfarin (PO)

• Antiplatelets = Preventing platelets sticking together
  - Aspirin (PO)
Blood Coagulation Profile

Prothrombin time (PT) :

- Time necessary to generate fibrin after activation of factor VII.

- A prolonged PT
  1. Either affected by abnormalities or deficiencies in coagulation factors I, II, VII or X
  2. Or by the presence of circulating anticoagulants

- Reference Range: 10-12 sec.
International Normalized Ratio (INR):

- Measures the time it takes for blood to clot and compares it to an average.
- Attempt to standardize the PT because of non-standardised thromboplastins.

\[
\text{INR} = \left( \frac{\text{Patient PT value}}{\text{Mean normal PT}} \right)^{\text{ISI value}}
\]

- Normal INR = (0.8–1.2)
Coaguchec® XS system

- Self-testing device for patients on vitamin K antagonist therapy to monitor their PT/INR values at home or on the go

- Features
  - Simple, fast process (1 min)
  - Finger-stick sample (no venous draw)
  - Patients receive comprehensive training
  - Built-in quality control.

How to use?
HemoSense INRatio PT/INR Monitoring System (InRatio2)

- Test Strips do not require refrigeration.
- Small one drop (15µL)
- Reduces paperwork and materials cost.
- Simple interface, easy to learn and use.
- Ensures reliability on each and every test.
- Entire test procedure requires fewer steps.
- Portable size increases geographic freedom.
How to use?

**Easy Test Procedure**

1) Turn on the meter, insert a Test Strip and check the Strip Code.

2) Perform a fingerstick when the meter displays “ADD SAMPLE”

3) Apply a hanging drop of blood to the sample well of the Test Strip

4) See the results within 2 minutes.
What Should you Cover During Warfarin Counseling?
ماذا تعرف عن الوارفارين؟
## Patient INR Test Results Diary

### Patient Name: _____________________________

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>INR Test Result</th>
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How to Give a Subcutaneous Injection

1. Use an alcohol swab to clean the skin where you will give yourself the shot.

2. Gently pinch up the skin and insert the needle into the skin at a 45° angle.

3. After you insert the needle completely, release your grasp of the skin.

4. Inject all of the solution by gently and steadily pushing down the plunger.

5. Withdraw the needle and syringe and press an alcohol swab on the spot where the shot was given.
Thank you