Screening for lipid disorders: screening strategies

Authors' objectives
This review addresses key question no 3 of the report: screening strategies for lipid disorders. Systematic reviews pertaining to questions 1 (drug therapy for lipid disorders) and 2 (diet and exercise therapy for lipid disorders) are summarised in other DARE abstracts.

The aim was to determine whether there is a reliable, accurate, acceptable and feasible screening test(s) that can be used to detect lipid disorders with a view to reducing cardiovascular events and, if so, who should be screened and how often should screening be performed.

Searching
MEDLINE (from 1995 to December 1998) and the Cochrane Controlled Trials Register were searched; the search terms were given. In addition, the bibliographies of included articles were handsearched. Adverse effects were searched for using the terms 'cholesterol', 'cholesterol dietary', 'hypercholesterolemia' and the exploded term 'anticholesteremic agents (adverse effects)'.

Study selection
Study designs of evaluations included in the review
All study designs were included.

Specific interventions included in the review
Screening strategies to identify abnormal blood lipid levels were included. Articles that addressed the epidemiology and natural history of lipid levels and lipid disorders were also included.

Reference standard test against which the new test was compared
The review did not include any diagnostic accuracy studies that compared the performance of the index test with a reference standard of diagnosis.

Participants included in the review
Studies of outpatients with or without coronary heart disease (CHD) were eligible for inclusion.

Outcomes assessed in the review
The outcomes assessed were precision and accuracy measures, acceptability to patients, feasibility and adverse events.

How were decisions on the relevance of primary studies made?
Two people independently reviewed the titles and abstracts of the articles identified by the literature searches, and excluded those that did not meet the criteria. Any disagreements were resolved by reading the full text of the article and discussion with a third reviewer until a consensus was agreed.

Assessment of study quality
The validity of the trials was assessed using the U.S. Preventive Services Task Force (USPSTF) criteria (see Other Publications of Related Interest). Two people assessed the quality of the randomised controlled trials (RCTs) found.

Data extraction
The authors stated that they abstracted data using tables in MS Word and MS Excel computer programs. The authors did not state how many reviewers performed the data extraction.
The categories of data extracted were: participant characteristics including familial history of elevated blood lipids, blood lipid concentration, and details and cut-offs of screening methods. Further details were given in the report.

**Methods of synthesis**

**How were the studies combined?**

The information from the studies was combined narratively under the 11 specific headings described above (see Number of Studies Included). In addition, tables summarising data under the following headings were presented: impact of learning one's cholesterol level; sensitivity of family history in identifying children and young adults with lipid disorders; and features of different screening strategies for adults.

**How were differences between studies investigated?**

Studies were described under different subheadings (e.g. Adults and Children).

**Results of the review**

Fifty-seven studies were included; with the exception of one study, the number of participants was not specified. The studies were divided into 11 categories.

Natural history of cholesterol in children, adolescents and adults (17 studies).

Identifying lipid disorders in young adults and children (9 studies).

Reliability of screening tests in adults and children (4 studies).

Accuracy in measuring CHD risk in adults (4 studies).

Acceptability for parents or patients (4 studies).

Feasibility for providers, including cost (9 studies).

Triglyceride measurement (2 studies).

Other predictors of risk of CHD (3 studies).

Harms and adverse effects of screening in adults and children (6 studies).

Current use of lipid screening in adults and children (6 studies).

Impact of learning one's cholesterol on cholesterol level (4 studies; 1,998 patients).

Screening middle-aged men and older men and women for lipid disorders can accurately identify persons at increased CHD risk who may benefit from therapy. The evidence pertaining to the benefits and harms of screening and treating persons at low absolute risk (i.e. most men under 35 years, women under 45 years, and children and adolescents) was insufficient. At least two measurements of total cholesterol and high-density lipoprotein are required to identify accurately persons with abnormal lipid levels. The role of measuring triglycerides and the optimal screening interval were unclear from the available evidence.

The diagnosis of a lipid disorder in adults does not appear to cause major psychological sequelae, or produce important changes in the mean values of indices of mental health. Of the two studies on children and adolescents, one found no effect on psychology while the other study showed an increased risk of a higher depression anxiety and neurosis score.

**Cost information**

Data from one study was given. The median Medicare Part B reimbursement rates were US$8 for total cholesterol alone, US$16 for high-density lipoprotein and US$11 for serum triglyceride alone. All three tests were reimbursed at a
rate of US$15 to US$20.

Authors’ conclusions
Screening for lipid disorders by an assessment of total cholesterol and high-density lipoprotein, and by performing a global assessment of CHD risk, can accurately identify those at sufficient risk who can benefit from treatment.

CRD commentary
This was a systematic review with a narrative synthesis. The review question was appropriate and focused on whether screening for lipid disorders is appropriate and reliable, and in which populations, with a view to intervening to prevent CHD or cardiovascular diseases. The authors used a systematic approach and added information from other sources when their searches did not identify any studies for inclusion.

The search strategy was adequate, although some useful trials might have been missed as the search was restricted to English language publications found on two electronic databases. The validity of the trials was assessed using published methods, which were implemented well. There was no description of the quality of evidence from different study designs, i.e. meta-analyses, RCTs and observational studies. Evidence from the better quality trials was not highlighted.

The narrative synthesis was appropriate, as was the information tabulated from the included studies. Harms, adverse events and exercise interventions were described from observational studies, experimental design studies and meta-analyses, which provided only a brief description of the data. The authors’ conclusions seem to follow from the results presented, but should be treated with some caution given the limitations highlighted.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that further data on the real-world use of lipid screening, and the means of improving the accuracy and efficiency of different screening strategies, are warranted. Better information about the effect of treating isolated abnormal triglycerides will help define the role of screening with triglyceride measurement, as will further research on the role of novel risk factors such as homocysteine or C-reactive protein.

Funding
Agency for Healthcare Research and Quality, contract number 290-97-0011.

Bibliographic details

Original Paper URL

Other publications of related interest

Indexing Status
Subject indexing assigned by CRD

MeSH
Coronary Disease; Hyperlipidemias /epidemiology /prevention & control; Mass Screening /methods

**AccessionNumber**
12002008770

**Date bibliographic record published**
28/02/2005

**Date abstract record published**
28/02/2005

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.