diabetes NEWSLETTER

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SQUARE PHARMACEUTICALS LTD. BANGLADESH

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# Inside Bangladesh

## Health beliefs & folk models of diabetes in British Bangladeshis

**Objective:** To explore the experience of diabetes in British Bangladeshis, since successful management of diabetes requires attention not just to observable behaviour but to the underlying attitudes and belief systems, which drive that behaviour.

**Design:** Qualitative study of subjects' experience of diabetes using narratives, semi-structured interviews, focus groups, and pile sorting exercises. A new qualitative method, the structured vignette, was developed for validating researchers' understanding of primary level culture.

**Subjects:** 40 British Bangladeshi patients with diabetes, and 10 non-Bangladeshi controls, recruited from primary care.

**Result:** Several constructs were detected in relation to body image, cause and nature of diabetes, food classification, and knowledge of complications. In some areas, the similarities between Bangladeshi and non-Bangladeshi subjects were as striking as their differences. There was little evidence of a fatalistic or deterministic attitude to prognosis, and most informants seemed highly motivated to alter their diet and comply with treatment. Structural and material barriers to behaviour change were at least as important as "cultural" ones.

**Conclusion:** Bangladeshi culture is neither seamless nor static, but some widely held beliefs and behaviours have been identified. Some of these have a potentially beneficial effect on health and should be used as the starting point for culturally sensitive diabetes education.

**Table: Examples of Bangladeshi patients' perceptions, structural and material barriers, and reinforcing factors affecting acceptance of a behavioural priority in diabetes education" People with diabetes should take regular sustained low-intensity physical exercise"**

| | Implications for health education and health policy |
|---|---|
| **Perceptions** | |
| Loss of body sweat, such as occurs during physical labour, is good for health | Recommendations for physical exercise should focus on the potential for producing sweat in ways other than physical labour |
| Prayers (namaz) are a form of physical exercise | Educators should be aware of the perceived association of prayer with exercise |
| Sport and organised physical exercise have no cultural meaning and are inappropriate for women and older men. Sports clothing and footwear are "not appropriate for our community" | Non-sporting activities that do not require special clothing or footwear may be more acceptable than pressure to become involved in sport |
| Walking is an acceptable form of exercise, but fast walking is inappropriate, especially for women and those of high social status | Promotion of walking and other indigenous activities may allow activity level to be increased in a culturally acceptable way, at least for males |
| Women should generally remain within the home, dress modestly, and remain demure. Young children should remain with their mother or grandmother at all times | Activities that can be done discretely and in private (such as home exercise videos) may be more acceptable to women |
| **Structural and material factors** | |
| Walking in the street is considered unsafe, particularly for women and elderly people, because of fear of crime and harassment | Effective local and national policies on crime and racial harassment, and community policing in particular, are required on health as well as social grounds |
| Opportunities for exercise in daily living often go unrecognised | Health promotion campaigns should encourage walking to school and shops rather than using motor transport |
| **Reinforcing factors** | |
| Advice from educators and health professionals is held in high regard | Even though physical exercise is not part of the culture, it should be encouraged in individual doctor-patient encounters |
| Approval or disapproval by family seems to strongly influence lifestyle choices | Involvement of key family members in education for exercise is likely to improve its success |

*Source:Trisha Greenhalgh, Cecil Helman, A Mu'min Chowdhury, BMJ 1998;316:978-983*

# Diabetescope

## Diabetes Seems to Heighten Glaucoma Risk

While diabetes has long been associated with the potentially sight-stealing disease diabetic retinopathy, it appears that another serious eye disease - glaucoma - may also be a complication of the metabolic disorder.

A recent study in the journal Ophthalmology found that women with diabetes have about a 70% increased risk of developing primary open-angle glaucoma.

Yet the link between diabetes and glaucoma hasn't been proven conclusively. There are a number of things, like diabetes, that appear to be a risk factor in a lot of population studies, but the association between diabetes and glaucoma is somewhat controversial.

Another study, also published in Ophthalmology, failed to find a link between diabetes and glaucoma in a trial that included almost 4,000 people from the Netherlands.

But, Pasquale's study was significantly larger, including more than 76,000 women enrolled in the 20-year-long Nurses' Health Study. And, the available evidence is convincing enough for the American Diabetes Association to conclude that the risk of glaucoma is increased in people with diabetes.

There are a number of ways that diabetes could increase the risk of glaucoma. One way is by causing elevation in pressure within the eye. Or it's possible, that diabetes could increase the susceptibility of the optic nerve to damage. There's also one form of glaucoma that's known to be directly related to diabetes - neovascular glaucoma.

The most important thing someone with diabetes can do to protect their eyes is to get regular eye exams. Glaucoma generally has no early symptoms. There is no way to detect glaucoma without an exam, and the only way to prevent the loss of vision from glaucoma is to treat the disease early. People with diabetes have their eyes checked once a year by an ophthalmologist for glaucoma and other serious eye diseases associated with diabetes.

*Source: May 2, 2008 , HealthDay News*

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## Diabetes in Middle Age Raises Alzheimer's Risk

Men who develop diabetes in middle age may be at greater risk of Alzheimer's disease, a Swedish study finds.

This results have important public health implications given the increasing numbers of people developing diabetes and the need for more powerful interventions.

The study included nearly 2,300 Swedish men who had glucose testing at age 50 to check for diabetes. The men were then followed for 32 years. The results: 102 were diagnosed with Alzheimer's disease, 57 with vascular dementia, and 235 with other types of dementia or cognitive impairment.

The study found that the men with low insulin levels at age 50 were nearly one-and-a-half times more likely to develop Alzheimer's disease than men who didn't have insulin problems. The risk of Alzheimer's increased, regardless of blood pressure, cholesterol, body-mass index and education.

This results suggest a link between insulin problems and the origins of Alzheimer's disease and emphasize the importance of insulin in normal brain function. It is possible that insulin problems damage blood vessels in the brain, which leads to memory problems and Alzheimer's disease, but more research is needed to identify the exact mechanisms.

The findings were published in the April 9 online issue of Neurology.

Another study, published in the April 8 print issue of Neurology, found that depression appears to more than double the risk of developing Alzheimer's.

*Source: April 9, 2008, HealthDay News*

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## Soy protein beneficial in type 2 diabetics

A diet rich in soy protein appears to have a lasting beneficial effect on the heart, blood vessels and kidneys of people with type 2 diabetes and kidney disease, Iranian researchers report in the journal Diabetes Care.

In a study, they found that soy protein consumption had a significant positive impact on cardiovascular risk factors and kidney-related biomarkers among type 2 diabetic patients with kidney disease.

Dr. Leila Azadbakht, of Isfahan University of Medical Sciences, and colleagues followed 41 patients with type 2 diabetes for 4 years. Twenty patients consumed a diet that was 35 percent animal protein, 35 percent textured soy protein and 30 percent vegetable protein.

The remaining 21 patients, who acted as controls, ate a diet that consisted of 70 percent animal protein and 30 percent vegetable protein. These patients received the same medical treatment as the soy group; the only difference was the absence of soy protein.

Compared with controls, patients who ate soy protein showed significantly lower levels of fasting blood sugar, total cholesterol, "bad" LDL cholesterol, and triglycerides.

In addition, circulating C-reactive protein levels, which signal inflammation in the body, were reduced as were levels of well known urinary markers of kidney disease.

Short-term studies have indicated such benefits with soy protein, but the researchers point out that this appears to be the first study that has demonstrated that these effects remain "stable with long-term consumption."

*Source: Diabetes Care, April 2008.*

# Diabetescope

## Diabetes Linked to Risk of Endometrial Cancer

Type 2 diabetes is associated with endometrial cancer, regardless of the presence of most other risk factors.

A positive association has been observed in nearly all studies of type 2 diabetes in relation to the incidence of endometrial cance. Given the adverse effect of obesity on the incidence of both diabetes and endometrial cancer, investigators have adjusted for obesity in a number of these studies. To varying degrees, all found that diabetes was independently associated with endometrial cancer.

The researchers examined whether the risk of endometrial cancer among type 2 diabetic women differs with respect to other endometrial cancer risk factors, using data from three population-based case-control studies conducted in western Washington State during 1985 to 1999. The studies included 1303 cases and 1779 controls.

An association was observed between type 2 diabetes and endometrial cancer. The association was stronger among women with a diabetes diagnosis within 5 years than those with a more distant diagnosis.

Diabetes associated with endometrial cancer among women with a BMI less than 35. No association was found between diabetes and endometrial cancer among women with a BMI of 35 or more.

They conclude that type 2 diabetes is associated with endometrial cancer irrespective of the presence of other risk factors, "except possibly hypertension and extreme obesity."

*Am J Epidemiol 2008;167:607-614.*

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# Lipoprotein Management in Patients With Cardiometabolic Risk

Risk factors for type 2 diabetes and cardiovascular disease (CVD) often cluster, including obesity (particularly central), insulin resistance, hyperglycemia, dyslipoproteinemia, and hypertension. These conditions can also occur in isolation, and they are exaggerated by physical inactivity and smoking. Since each of these factors increases risk of CVD, the concept of global cardiometabolic risk (CMR) (Figure) is of value. Lipoprotein abnormalities, including elevated triglycerides, low HDL cholesterol, and increased numbers of small dense LDL particles, are common findings in patients with CMR. Clinical entities with increased CMR include type 2 diabetes, familial combined hyperlipidemia, familial hypoalphalipoproteinemia, and polycystic ovary syndrome. These disorders often share the CMR characteristics of central obesity, insulin resistance, dyslipoproteinemia, and hypertension.

There are stringent lipid treatment goals for patients with type 2 diabetes or CVD; however, guidelines for treatment of dyslipoproteinemia in high-risk subjects without diabetes or CVD are less intense and are based primarily on LDL cholesterol concentrations, with non- HDL concentrations a secondary consideration in some subjects. Numerous trials have demonstrated that therapies (primarily statins) directed at LDL cholesterol lowering clearly reduce risk of CVD events in patients with diabetes and in those without diabetes but with other CVD risk factors; yet, a number of questions remain. Even with adequate LDL cholesterol lowering, many patients on statin therapy have significant residual CVD risk. It is unclear whether lipoprotein parameters other than LDL or non-HDL cholesterol provide clinically significant additional prognostic information regarding CVD risk, yield more information about the effectiveness of therapy, or indicate more appropriate treatment targets. Many patients with CMR or diabetes have relatively normal levels of LDL cholesterol but increased numbers of small dense LDL particles and other atherogenic lipoproteins. Some have advocated that assessment of other lipoprotein parameters might be more helpful than assessment limited to LDL or non-HDL cholesterol in these populations. In addition, treatment targets and the best approach for CVD risk reduction in this population need to be better defined.

## WHAT ARE THE CLINICALLY IMPORTANT LIPOPROTEIN PARAMETERS?

To intervene to prevent, halt, or reverse atherosclerosis, it is important to identify which lipoproteins, or lipoprotein components, are most clinically relevant. A large body of research, ranging from molecular to population studies, indicates that elevated LDL cholesterol is a major predictor of CVD, including in populations with CMR or diabetes. Mean LDL cholesterol levels are similar in diabetic, insulin-resistant, and nondiabetic populations, but levels vary widely among individuals within any population, due to a variety of genetic and environmental causes. In the UK Prospective Diabetes Study trial of patients with type 2 diabetes, LDL cholesterol was the most powerful risk factor predicting cardiovascular risk. Data from several studies suggest that elevated levels of LDL cholesterol may have even more adverse effects in individuals with insulin resistance and diabetes than in individuals without insulin resistance or diabetes. There do not appear to be meaningful sex differences. Age effects have not been thoroughly examined. A number of large randomized controlled trials that have established that lowering LDL cholesterol in individuals with diabetes or with multiple cardiovascular risk factors lowers CVD event rates for both primary and secondary prevention. Despite the usefulness of LDL cholesterol, the measure may have limitations for individual risk assessment. The reference method, beta quantitation, is complex and expensive. LDL cholesterol is typically estimated using the Friedewald equation, but this equation

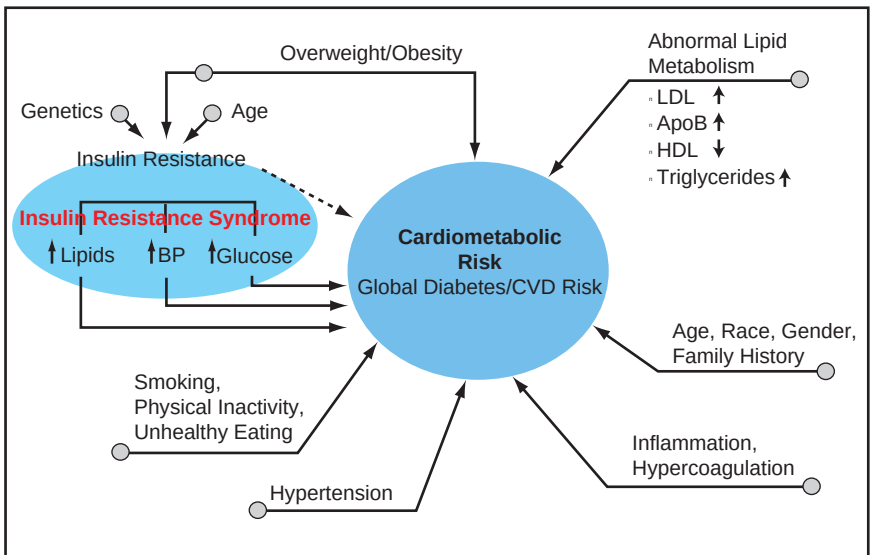


**Figure: Factors contributing to cardiometabolic risk.**

progressively underestimates LDL cholesterol as triglyceride levels increase. Available “direct” methods to measure LDL cholesterol are not well standardized. Measurement of LDL cholesterol (the cholesterol within LDL particles) has been the standard approach to approximate LDL levels.However, the cholesterol content of LDL particles varies from person to person and is influenced by metabolic abnormalities such as insulin resistance and hyperglycemia. Hence, measurement of LDL cholesterol may not accurately reflect the true burden of atherogenic LDL particles, especially in those with the typical lipoprotein abnormalities of CMR: elevated triglycerides, low HDL cholesterol, and increased numbers of small LDL particles.

**LDL particle number**

A more accurate way to capture the risk posed by LDL may be to measure the number & size of LDL particles directly using nuclear magnetic resonance (NMR) and are important predictors of CVD. But, it is unclear whether LDL particle size measurements add value to measurement of LDL particle concentration.

**Lipoprotein(a)**

Lipoprotein(a) [Lp(a)], an apoBcontaining LDL-like particle with enhanced binding to intimal proteoglycans and prothrombotic effect, also predicts CVD. The clinical utility of routine measurement of Lp(a) is unclear.

**Non-HDL cholesterol**

Non-HDL cholesterol (total cholesterol minus HDL cholesterol) reflects the concentration of cholesterol within all lipoprotein particles currently considered atherogenic. The Adult Treatment Panel III (ATP III) proposed that in individuals with hypertriglyceridemia (which would include many with CMR or diabetes), non-HDL cholesterol levels are a secondary goal of therapy after targeting LDL cholesterol levels. Many studies have demonstrated that non-HDL cholesterol is a better predictor of CVD risk than is LDL cholesterol, and this may be especially true of statin-treated patients. Additional benefits of non-HDL cholesterol measurement are its lack of additional expense in patients already getting lipid panel measurements and that it can be calculated from nonfasting samples.

**ApoB-100**

ApoB is found in chylomicrons, VLDL, IDL, LDL, and Lp(a) particles. Since each of these particles contains a single apoB molecule, measurements of apoB represent the total burden of particles considered most atherogenic. ApoB measurements do not require a fasting sample, and the assay has been standardized, but is not yet widely available. ApoB has been found to be a better predictor of CVD risk than LDL cholesterol, particularly the on treatment LDL cholesterol level. Once LDL cholesterol is lowered, apoB may be a more effective way to assess residual CVD risk and to determine the need for medication adjustments. However, not all studies agree.

**Triglyceride-rich lipoproteins**

In the fasting state, plasma triglycerides are primarily found in VLDL, so plasma triglyceride measurements are used as a surrogate measure of VLDL. Triglycerides are a univariate predictor of CVD in many studies but often not an independent predictor in multivariate analyses. Similarly, there are no clinical trial data establishing that lowering triglycerides in individuals with or without diabetes independently leads to lower CVD event rates when one adjusts for changes in HDL cholesterol.

**HDL cholesterol**

HDL cholesterol levels are strong inverse predictors of CVD events in both diabetic and nondiabetic populations. It has been difficult to determine whether raising HDL cholesterol independently reduces CVD events, because all interventions that raise HDL cholesterol also affect the concentration of other lipoproteins.

**IN THE EVALUATION AND TREATMENT OF PATIENTS WITH LIPOPROTEIN ABNORMALITIES, ARE THERE OTHER FACTORS THAT SHOULD BE CONSIDERED?**

In patients with lipoprotein abnormalities, good clinical practice calls for a comprehensive evaluation of their current vascular health, factors contributing to the observed dyslipoproteinemia, and other factors that may alter the global risk of first or recurrent CVD event. The objectives of the evaluation are as follows: 1) to determine, to the extent possible, the magnitude of the future risk of CVD events; 2) to identify the presence of prognostic factors that may be modifiable; and 3) to establish a treatment plan both in terms of scope and intensity.

Stratification by the presence or absence of clinical CVD is important for decisions about the type of intervention and its intensity. The presence of so-called subclinical vascular disease may be determined by measuring coronary calcification, carotid intima media thickness, or the ankle-brachial index. Patients with documented subclinical atherosclerosis are at increased CVD risk and may be considered candidates for more aggressive therapy. Whether such tests improve prediction or clinical decision making in patients with diabetes or CMR is unclear.

Modifiable risk factors include high blood pressure, smoking, hyperglycemia, obesity, adverse dietary habits,

and physical inactivity. The main nonmodifiable prognostic factors are age, sex, ethnicity, and family history; other risk factors such as chronic kidney disease may also be present. Family history of premature CAD, especially in siblings, also is a powerful prognostic factor.

Additional biomarkers (e.g., C-reactive protein [CRP], fibrinogen, and homocysteine) have been evaluated to determine their prognostic significance; however, their independent predictive power and clinical utility are still unclear.

**Risk assessment and strategies in primary prevention**

Some global risk assessment tools estimate an individual's risk of a major coronary heart disease event (such as fatal or nonfatal MI) over 10 years. There is a general consensus that a 10-year risk of ≥20% requires aggressive intervention directed at the abnormal prognostic factors. Although such tools are helpful, they underestimate lifetime risk, especially in youth and women.

**Risk assessment and strategies in secondary prevention**

The prognostic factors for the secondary prevention of CVD include those for primary prevention but also include several related to myocardial injury. For example, myocardial ischemia, left ventricular dysfunction, and ventricular arrhythmias are powerful prognostic indicators after myocardial infarction (MI).

**WHAT ARE THE PRINCIPLES AND OBJECTIVES OF TREATMENT OF LIPOPROTEIN ABNORMALITIES?**

Dyslipoproteinemia implies the presence of an increased number of atherogenic lipoproteins and/or a reduced protective capacity of HDL beyond what is considered optimal. It is present when levels of triglycerides are high, HDL cholesterol is low, and/or there is atherogenic particle excess, such as high LDL cholesterol or an increased number of small LDL particles. Cut points have been developed to define values associated with increased CVD risk.

**LDL cholesterol**

The primary objective in reducing risk for CVD events through modification of lipid and lipoprotein risk factors is to lower LDL cholesterol values.

*Determining cut points for initiating therapy*

LDL cholesterol values <100 mg/dl are optimal. Lifestyle recommendations targeted at reduction of saturated and trans unsaturated fat and cholesterol intake, lowering of excess body weight, and increasing intake of soluble fiber should be emphasized as first-line therapy for those with LDL cholesterol values >100 mg/dl. It is clear that the absolute benefit that can be achieved by LDL cholesterol lowering is proportional to the underlying global risk for CVD in a given individual. Thus, guidelines for initiating both medical nutrition therapy as well as pharmacologic treatment aimed at LDL cholesterol lowering have been stratified by level of risk. In addition, pharmacologic therapy for moderately high-risk primary prevention patients (those with two or more CMR risk factors and a 10-year risk >10%) if LDL cholesterol levels remain >100 mg/dl after several months of lifestyle changes.

*Therapeutic options for LDL cholesterol lowering*

With respect to dietary principles, the standard recommendations for LDL cholesterol lowering have focused on lowering saturated and trans fat to < 7% of calories and dietary cholesterol to < 200 mg/day, lowering excess body weight by at least 5-10%, and increasing soluble fiber consumption. In addition, increasing plant sterol and stanol intake modestly lowers LDL cholesterol. Weight reduction and weight maintenance are best achieved by a combination of caloric reduction and increased physical activity.

As a result of the strong evidence base for the benefits of statin treatment on CVD outcomes, this class of drugs provides the primary pharmacologic modality for LDL cholesterol lowering. However, significant CVD benefit has been directly linked to LDL cholesterol lowering using other modalities of treatment including diet, bile acid sequestrants, and ileal bypass surgery.

For patients who cannot tolerate a statin, or in whom maximal dose statin therapy does not achieve treatment goals, other LDL cholesterol-lowering drugs include ezetimibe, bile-acid sequestrants, or niacin. As monotherapy, these drugs are less effective at lowering LDL cholesterol than statins, but each enhances the LDL-lowering effect of statins. Bile-acid binding drugs, when used alone, can aggravate the dyslipidemia seen with insulin resistance by increasing triglycerides. Bile-acid resins in combination with a statin or nicotinic acid with a statin selectively decrease small dense LDL particles.

*Assessing response to therapy*

Routine calculation and use of non-HDL cholesterol constitute a better index than LDL cholesterol for identifying high-risk patients. That does not mean, however, that LDL cholesterol should not be measured and used to guide therapy. The calculation of non-HDL cholesterol should be provided on all laboratory reports and should also be used to ascertain risk in patients with low to moderate LDL cholesterol levels (i.e., LDL cholesterol <130 mg/dl). Because apoB appears to be a more sensitive index of residual CVD risk when LDL cholesterol or non-HDL cholesterol are <130 mg/dl or <160 mg/dl, respectively,

measurement of apoB, using a standardized assay, is warranted in patients with CMR on pharmacologic treatment. In particular, apoB levels should be used to guide adjustments of therapy. While LDL particle number as measured by NMR appears equally informative as apoB, the concerns expressed above with regard to this assay limit its widespread adoption at this time.

*Treatment goals for adults with CMR and lipoprotein abnormalities.*

Highest-risk individuals be treated to an LDL cholesterol goal <70 mg/dl, a non-HDL cholesterol goal <100 mg/dl, and an apoB goal <80 mg/dl. High-risk individuals be treated to an LDL cholesterol goal <100 mg/dl, a non-HDL cholesterol goal <130 mg/dl, and an apoB goal <90 mg/dl. These treatment goal recommendations (Table) are based on evaluation of the available evidence.

**Other lipids and lipoproteins**

Approaches directed at lowering triglyceride-rich lipoproteins and raising reduced HDL cholesterol levels have been assigned secondary levels of therapeutic importance. For subjects with mildly or moderately elevated triglyceride levels (>200mg/dl), recommendation is to target LDL cholesterol first and then use non-HDL cholesterol as a secondary target for treatment, with a goal 30 mg/dl higher than the patient's LDL cholesterol goal, but further recommendation is that the population equivalent apoB goal to be reached. The exception to not targeting triglycerides initially is the relatively small proportion of patients with severe hypertriglyceridemia in whom the initial treatment priority is to reduce the risk of pancreatitis by combining dietary fat restriction with fibrate, niacin, or high-dose n-3 fatty acid therapy. All patients with low HDL cholesterol should receive lifestyle counseling focusing on weight reduction, increased physical activity, avoidance of very high carbohydrate diets, and discontinuing smoking.

A statin is the initial drug of choice for the vast majority of people with CMR who have elevated triglycerides and low HDL cholesterol. In individuals on statin therapy who continue to have low HDL cholesterol or elevated non-HDL cholesterol, especially if apoB levels remain elevated, combination therapy is recommended.

The preferred agent to use in combination with a statin is nicotinic acid because there is somewhat better evidence for reduction in CVD events with niacin, as monotherapy or in combination, than there is for fibrates. Nicotinic acid decreased CVD in the Coronary Drug Project and total mortality in extended follow-up. Nicotinic acid in combination with a bile-acid binding resin or a statin was associated with regression of atherosclerosis and reduced CVD events in several studies. Although nicotinic acid has been associated with insulin resistance, in diabetes the use of low-dose nicotinic acid (1,500 mg/day) does not significantly increase $A_{1C}$ levels.

Fibrates have been shown to reduce CVD events in some studies but not mortality. n-3 fatty acid therapy lowers plasma triglyceride levels at high doses ( $\geq$4 g/day) and may be another option to consider to lower non-HDL cholesterol in patients on statin therapy, but CVD outcome data are lacking for hypertriglyceridemic patients treated with these doses of n-3 fatty acids. In diabetic subjects, enhanced glycemic control may improve lipid and lipoprotein abnormalities, particularly hypertriglyceridemia. Specific antihyperglycemic agents may have advantages in this respect. For example, metformin has modest triglyceridelowering properties. Pioglitazone raises HDL cholesterol to a greater extent than rosiglitazone and lowers triglycerides, while rosiglitazone leads to a modest increase in triglycerides. Furthermore, pioglitazone lowers whereas rosiglitazone increases LDL particle number.

**SUMMARY**

Patients with cardiometabolic risk factors represent a group at high lifetime risk for CVD. These patients frequently have dyslipoproteinemia (low HDL cholesterol, increased triglycerides, and/or an increased number of small LDL particles). An assessment of global risk followed by a multifactorial risk reduction strategy for such individuals targeting each risk factor and emphasizing both lifestyle

**Table: Suggested treatment goals in patients with CMR and lipoprotein abnormalities**

| | Goals | | |
|---|---|---|---|
| | LDL cholesterol (mg/dl) | Non-HDL cholesterol (mg/dl) | ApoB (mg/dl) |
| Highest-risk patients, including those with<br>1) known CVD or<br>2) diabetes plus one or more additional major CVD risk factor | <70 | <100 | <80 |
| High-risk patients, including those with<br>1) no diabetes or known clinical CVD but two or more additional major CVD risk factors or<br>2) diabetes but no other major CVD risk factors | <100 | <130 | <90 |

*Other major risk factors (beyond dyslipoproteinemia) include smoking, hypertension, and family history of premature CAD.*

and pharmacologic therapy. In terms of dyslipoproteinemia, recommend the following:

- Statin therapy for the majority of dyslipoproteinemic adult patients with CMR
- For patients with CMR on statin therapy, guiding therapy with measurements of apoB and treatment to apoB goals in addition to LDL cholesterol and non-HDL cholesterol assessments
- Treatment goals, summarized in Table, that address the high lifetime risk of patients with dyslipoproteinemia and CMR.
- Clinical trials to determine whether the pharmacologic therapy required to achieve very low levels of atherogenic lipoproteins is safe and cost-effective
- A concerted, multifaceted, public health effort, focused on lifestyle modification, to reduce mean population levels of atherogenic lipoproteins to values well below current ones.

*Reference: Diabetes Care, Volume 31, Number 4, April 2008*

# Congratulations !

## The Winners of *diabetes Quiz Competition*

Vol. 6 No. 2, April - June 2008

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**Editorial Note:**

Dear Doctor, This issue of your *diabetes newsletter is* focused on *"Considerations Lipoprotein Management in Patients With Cardiometabolic Risk.* We appreciate your comments and queries. Please participate in quiz competition & win prizes.