diabetes NEWSLETTER

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Inside Bangladesh

Prevention of type 2 diabetes in British Bangladeshis: study of community, religious, and professional perspectives

Objective: To understand lay beliefs and attitudes, religious teachings, and professional perceptions in relation to diabetes prevention in the Bangladeshi community.

Design: Qualitative study (focus groups and semistructured interviews).

Setting: Tower Hamlets, a socioeconomically deprived London borough, United Kingdom.

Participants: Bangladeshi people without diabetes (phase 1), religious leaders and Islamic scholars (phase 2), and health professionals (phase 3).

Methods: 17 focus groups were run using purposive sampling in three sequential phases. Thematic analysis was used iteratively to achieve progressive focusing and to develop theory. To explore tensions in preliminary data fictional vignettes were created, which were discussed by participants in subsequent phases. The PEN-3 multilevel theoretical framework was used to inform data analysis and synthesis.

Results: Most lay participants accepted the concept of diabetes prevention and were more knowledgeable than expected. Practical and structural barriers to a healthy lifestyle were commonly reported. There was a strong desire to comply with cultural norms, particularly those relating to modesty. Religious leaders provided considerable support from Islamic teachings for messages about diabetes prevention. Some clinicians incorrectly perceived Bangladeshis to be poorly informed and fatalistic, although they also expressed concerns about their own limited cultural understanding.

Conclusion: Contrary to the views of health professionals and earlier research, poor knowledge was not the main barrier to healthy lifestyle choices. The norms and expectations of Islam offer many opportunities for supporting diabetes prevention. Interventions designed for the white population, however, need adaptation before they will be meaningful to many Bangladeshis. Religion may have an important part to play in supporting health promotion in this community. The potential for collaborative working between health educators and religious leaders should be explored further and the low cultural understanding of health professionals addressed.

Source: Clare Grace, Reha Begum, Syed Subhani, Peter Kopelman, Trisha Greenhalgh. BMJ 2008;337:a1931

Diabetescope

Coffee Components May Improve Glucose Tolerance

Chlorogenic acid and trigonelline, which are present in coffee, may improve glucose tolerance. In prospective cohort studies, higher coffee consumption has been associated with a lower risk of type 2 diabetes. Associations have been similar for caffeinated and decaffeinated coffee suggesting that coffee components other than caffeine have beneficial effects. Coffee is a major source of the phenolic compound chlorogenic acid and the vitamin B3 precursor trigonelline that have been shown to reduce blood glucose concentrations in animal studies.

The goal of this study was to determine the acute effects of decaffeinated coffee, chlorogenic acid, & trigonelline on glucose tolerance in 15 overweight men. During a 2-hour OGTT, the investigators studied the effects on glucose and insulin of 12 g decaffeinated coffee, 1 g chlorogenic acid, 500 mg trigonelline, and placebo.

Compared with placebo, chlorogenic acid and trigonelline ingestion were associated with significant reductions in glucose and insulin, respectively concentrations 15 minutes after an OGTT. However, insulin and glucose area under the curve values during the OGTT were similar for each of the treatments vs placebo.

Limitations of this study include that multiple tests were conducted for different time points, increasing the likelihood of chance findings, and difficulty comparing the treatment effects because the decaffeinated coffee supplement contained substantially less chlorogenic acid and trigonelline than the doses given in isolation.

Source: Diabetes Care, Published online March 26, 2009.

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IL-1 Receptor Antagonist Precedes Onset of Type 2 Diabetes

Elevated levels of interleukin-1 receptor antagonist (IL-1Ra), a natural inhibitor of interleukin-1 beta, precede the onset of type 2 diabetes.

Researchers point out that this receptor antagonist has been shown to improve beta-cell function and glycemic control in patients with type 2 diabetes. However, the relationship between baseline levels and diabetes onset has not been explored.

To do so, the researchers measured serum IL-1Ra concentrations in 181 patients and 376 matched normoglycemic controls who were followed for more than 10 years. All were participants in the Whitehall II cohort of more than 10,000 UK civil servants.

IL-1Ra concentrations at baseline were significantly higher in cases than controls (median 232.8 pg/mL versus 207.6 pg/mL) and were significantly associated with incident type 2 diabetes. This remained the case after adjusting for potential confounders including age and cardiovascular risk factors.

However, adjustment for 2-hour glucose attenuated the association. This suggests that increased IL-1Ra levels are a reaction to and not a cause of early postprandial hyperglycemia before the onset of diabetes. It seems as if the body attempts to counterregulate proinflammatory disturbances before the onset of disease by an upregulation of antiinflammatory markers, but eventually fails.

It remains to be seen whether additional stimulation of this antiinflammatory response can help to prevent or delay the onset of type 2 diabetes.

Source: Diabetes Care 2009;32:421-423.

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Diabetics have less chance of Prostate Cancer Risk

An analysis of data from the Health Professionals Follow-up Study confirms that men with diabetes mellitus are less prone to develop prostate cancer than their diabetes-free peers.

According to a report in the March 15th issue of the International Journal of Cancer, prostate cancer is 17% less likely in men with diabetes. However, the reduced risk is not apparent until at least 1 year after the diabetes diagnosis.

As suggested, other studies have reported an inverse association between diabetes and the risk of prostate cancer. However, many of these studies have not adjusted for lifestyle factors or time since diabetes diagnosis.

The current study featured 46,168 non-diabetic and 1613 diabetic men. During follow-up from 1986 to 2004, prostate cancer was diagnosed in 4511 men.

Men who had the disease for 1 to 6, 6 to 15, or >15 years were 18%, 25%, and 22% less likely to develop prostate cancer, respectively, than their nondiabetic counterparts. The inverse relationship was strongest in the pre-PSA testing era (before 1994) than afterward.

The results also showed that men with obesity and diabetes had a lower risk of prostate cancer than men with only one of the two conditions.

"The overall evidence for an inverse association between diabetes mellitus and prostate cancer continues to grow and studying these biological clues will continue to provide insight into the metabolic and hormonal changes behind prostatic cancer," the authors conclude.

Source: Int J Cancer 2009;124:1398-1403.

Diabetescope

Daily Consumption of Diet Soda Linked to Metabolic Syndrome, Type 2 Diabetes

Drinking diet soda at least daily is associated with significantly greater risks for select incident components of the metabolic syndrome (MetSyn) and type 2 diabetes.

Previous studies have not addressed associations between diet soda and individual MetSyn components or risk of type 2 diabetes nor have they fully addressed potential longitudinal mediators of these relationships.

Initial evaluation was performed from 2000 to 2002, at which time baseline food frequency questionnaires measured diet soda consumption. Follow-up evaluations were performed from 2002 to 2003, 2004 to 2005, and 2005 to 2007.

Compared with participants who did not drink diet soda, those who drank diet soda at least daily had a 36% greater relative risk for incident MetSyn and a 67% greater relative risk for incident type 2 diabetes.

High waist circumference and high fasting glucose levels were prospectively associated with consumption of diet soda. Associations between diet soda intake and type 2 diabetes were independent of baseline measures of adiposity or changes in these measures. In contrast, associations between diet soda and MetSyn were not independent of these factors.

Although these observational data cannot establish causality, consumption of diet soda at least daily was associated with significantly greater risks of select incident MetSyn components and type 2 diabetes.

Limitations of this study include observational design, precluding determination of causality; possible confounding by other dietary and lifestyle/behavioral factors; and difficulties in estimating intake of diet soda or artificial sweetener.

Source: Diabetes Care. Published online January 16, 2009.

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The prevention of type 2 diabetes

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is rapidly becoming one of the most common chronic diseas. T2DM is most prevalents among the elderly. The enormous human and financial costs that accompany T2DM, and the challenge of treating it effectively once it has developed, make it an appropriate target for prevention.

PATHOPHYSIOLOGY

T2DM is characterized by insulin resistance and cell dysfunction. Insulin resistance is frequently well established in individuals with impaired glucose tolerance, and it is the presence of beta-cell dysfunction that distinguishes those in whom glucose intolerance worsens from those in whom it remains stable. Interventions that decrease insulin resistance and preserve or improve cell function are likely to be effective in slowing progression from impaired glucose tolerance to diabetes, or even allowing reversion to normal glucose tolerance. Many interventions, such as drugs, weight loss and physical activity, are thought to improve insulin resistance and might also affect insulin secretion.

EARLY PREVENTION STUDIES

Randomized clinical trials of preventive strategies for T2DM began in the 1960s. Three early trials examined drugs then in common use to treat T2DM. None of these pioneering studies established whether diabetes could be prevented or delayed, and their findings were inconclusive owing to the small sample sizes used. The Malmöhus study had the provocative findings - that tolbutamide has the potential to prevent diabetes. This conclusion of the article was, however, inappropriately based on the analysis of adherence. Analysis by intention to treat, generally considered the proper way to assess treatment effects in a clinical trial, did not support a preventive effect of tolbutamide. The study provided early support for the hypothesis that the benefits of treatments for hyperglycemia might persist long after active intervention ends.

STUDIES OF LIFESTYLE MODIFICATION

Diet and exercise

Over the past 10 years several randomized clinical trials have formally tested the hypothesis that lifestyle modification, namely weight loss and/or increased activity or exercise, can prevent T2DM. Their findings indicate that such changes can prevent the onset of diabetes in people at risk **(Table 1)**. The first of these studies was conducted in Chinese community health clinics and included 577 individuals with impaired glucose tolerance. Individuals were assigned to a program of dietary modification, exercise, or both, and were followed up for 6 years. The 6-year cumulative incidence of diabetes was high in all groups (48%, 41%, 46% and 68% in the diet-only, exercise-only, diet plus exercise and control groups, respectively). The relationship between the amount of weight lost and diabetes incidence was inconsistent and all three interventions were similarly effective in preventing diabetes.The Finnish Diabetes Prevention Study (DPS) was a randomized study of 522 over-weight, middle-aged adults with impaired glucose tolerance. The lifestyle intervention included dietary and exercise components. The intervention group lost an average of 4.2 kg in the first year and compared with the control group, had a 58% reduction in diabetes incidence during the whole study (~4 years). Although this study was not designed to assess the individual contributions of the diet and exercise components, participants who undertook particularly vigorous leisure time physical activities had a markedly reduced risk of diabetes. After cessation of the intervention, the reduction in diabetes risk persisted - over 7 years of follow-up, the intervention group had an overall reduction in their risk of diabetes of 43% compared with the control group. In a multivariate analysis that considered the success of achieving all five lifestyle goals, only weight reduction remained a significant determinant of diabetes risk. The largest and most comprehensive life-style modification study was the US Diabetes Prevention Program (DPP). The DPP randomly allocated 3,234 overweight, mostly middle-aged adults with impaired glucose tolerance and fasting plasma glucose values of 5.3 mmol/l or higher to intensive lifestyle intervention, metformin or placebo. An additional 585 participants were randomly assigned troglitazone therapy, but recruitment to this group and participants' ongoing treatment were terminated prematurely owing to concern over possible hepatotoxic effects. The DPP lifestyle intervention was associated with a 58% reduction in the incidence of diabetes, compared to placebo plus standard lifestyle recommendations. Weight loss was the predominant predictor of reduced diabetes incidence, with a 16% reduction in risk per kilogram of weight lost. However, participants who achieved their exercise goals but not their weight loss goals also experienced some reduction in diabetes risk (44%, compared to placebo-treated individuals). Changes in physical activity and diet (primarily, a reduced calorie intake from fat) predicted weight loss, and weight loss, in turn, was associated with a reduced risk of developing T2DM. Studies of diabetes prevention in Japan and India also confirmed the benefit of lifestyle modification programs. Even with quite modest weight losses (0–2 kg), risk reductions of 67% and 28% were achieved in the Japanese and Indian studies, respectively.

Bariatric surgery

Bariatric surgery can effectively reverse or prevent T2DM. Pories et al noted the marked effect of weight-reduction surgery on diabetes. Although their data were retrospectively reviewed, they reported an annual diabetes incidence of 4.5% in the control group, compared to only 1.0% in the surgically treated group. The Swedish Obese Subjects (SOS) Study was a prospective trial of more than 2,000 individuals who underwent a variety of surgical procedures and matched controls who received standard care. The odds ratio for

Table 1 Randomized, clinical trials that aimed to prevent diabetes by lifestyle modification.

Study[a]	Number of patients by treatment group	BMI of participants (kg/m^2)	Duration of intervention (years)	Lifestyle goals	Weight loss achieved at 1 year (kg)	Cumulative incidence of T2DM in controls	Risk reduction (95% CI)
Pan et al. (1997)	130 diet 141 exercise 126 diet and exercise 133 control	26	6	Weight loss + maintenance of a healthy diet ± exercise	NR	68% (15.7% per year)	Diet 31% (NR) Exercise 46% (NR) Both 42% (NR)
Tuomilehto et al. (2001)	265 active 257 control	31	4	5% weight loss on low-fat, high-fiber diet + 30 min exercise per day	4.2	23% (6% per year)	58% (30–70%)
DPP Research Group (2002)	1,079 active 1,082 control	34	2.8	7% weight loss + 150 min exercise per week	7	28.9% at 3 years	58% (48–66%)
Kosaka et al. (2005)[b]	356 active 102 control	24	4	Reduction in BMI to 22 kg/m2 by 30–40 min exercise per day	2.5	9.3% (assessed by FPG >7.8 mmol/l)	67.4% (NR)
Ramachandran et al. (2006)	133 active 136 control	26	3	Weight maintenance by diet low in refined carbohydrates and fat + 30 min exercise per day	0	55%	28.5% (20–37%)

[a]All study populations had impaired glucose tolerance. [b]In this study, the oral glucose tolerance test used 100 g glucose and modified criteria for impaired glucose tolerance. Abbreviations: DPP, Diabetes Prevention Program; FPG, fasting plasma glucose; IGT, impaired glucose tolerance; NR, not reported; T2DM, type 2 diabetes mellitus.

diabetes in the surgically treated group was 0.14 at 2 years and 0.25 at 10 years of follow-up. As expected, the incidence of diabetes was related to the amount of weight lost. Other studies showed that laparoscopic adjustable gastric banding in patients with established diabetes resulted in remission of diabetes in 64% and major improvements in glycemic control in another 26%. Glucose tolerance has been reported to improve rapidly after bariatric surgery, even before much weight has been lost; neurohormonal mechanisms are reported to be involved.

STUDIES OF PHARMACOLOGIC INTERVENTIONS

Various pharmacologic agents have been studied (Table 2), including drugs commonly used to treat established diabetes (metformin, acarbose, thiazolidinediones) and a weight-loss drug (orlistat).

Metformin

The biguanide, metformin, is the most thoroughly studied drug used for diabetes prevention. By far the largest group of metformin-treated patients studied was included in the DPP, in which high-risk individuals with impaired glucose tolerance were randomly allocated 850 mg metformin twice daily (n = 1,073) or placebo (n = 1,082). Mean follow-up was 2.8 years. Adherence to metformin was excellent and, despite the anticipated gastrointestinal side effects and twice-daily dosing regimen, metformin reduced the risk of developing diabetes by 31% compared to placebo. Metformin was most effective in individuals whose baseline BMI was higher than 35 kg/m^2, in whom it reduced the incidence of diabetes by approximately 50%. Metformin had little beneficial effect in older participants (those aged 60–85 years). An average 1.7 kg weight loss was reported in the metformin group, compared to a 0.3 kg weight gain in the placebo group; weight loss explained 64% of the beneficial effect of metformin on diabetes risk. Favorable changes in insulin sensitivity and in secretion of proinsulin also contrib-uted to the decreased diabetes risk seen in metformintreated patients. Two smaller studies in India and in China also reported similar reductions in diabetes risk with 250 mg of metformin administered two or three times daily. The excellent safety record, long experience with this drug in the treatment of diabetes and low cost of metformin make it an attractive option for diabetes prevention.

Thiazolidinediones

The insulin-sensitizing properties of the thiazolidinediones have generated enthusiasm for their role in diabetes prevention. Troglitazone reduced the development of diabetes by around 50% over 2.5 years in a group of women with prior gestational diabetes. Troglitazone administration in the DPP was discontinued prematurely owing to its hepatotoxic effects, but during the average 0.9 years of exposure, diabetes incidence was reduced by 75%. Administration of rosiglitazone over 3 years has since been studied in 5,269 patients with impaired fasting glucose, impaired glucose tolerance, or both. The incidence of diabetes was reduced by 62%, and 50% of rosiglitazone-treated patients reverted to normoglycemia (compared to 30% of placebo-treated patients). Like metformin, rosiglitazone seems to be most effective in individuals with a high BMI. Notable side effects, including weight gain (rosiglitazone-treated patients gained 2.2 kg more than placebo-treated patients) and edema were observed. The frequency of congestive heart failure was also increased in the rosiglitazone group, but there were few cases in this

generally healthy population. Questions have been raised about potential cardiovascular toxic effects of rosiglitazone and this issue remains to be resolved. Additional concerns about rosiglitazone include one report of an increased rate of osteoporotic fracture among diabetic women.

Acarbose

The glucosidase inhibitor, acarbose, has been studied in a number of clinical trials. Most notably, the STOP-NIDDM (Study to Prevent Non-Insulin-Dependent Diabetes Mellitus) trial reported that acarbose treatment was associated with a 25% reduction in the incidence of diabetes in a large (n = 1,429), cohort of high-risk individuals with impaired glucose tolerance. Approximately one-quarter of the cohort did not complete the study. The particularly high drop-out rate in acarbose-treated patients was attributed to its well-known gastrointestinal side effects. Acarbose might, therefore, have limited value for diabetes prevention in general practice.

Weight-loss agents

Weight-loss agents have been studied in small numbers of individuals. Orlistat reduced the development of diabetes by 40–52% in obese people with impaired glucose tolerance. The effect of this drug on diabetes might be attributable to weight loss, which was greater than that achieved with lifestyle change alone. The drop-out rate approached 50%, which suggests that this therapy has limited acceptability.

Other drugs

Following post hoc analyses that suggested angiotensin-converting-enzyme inhibitors might reduce diabetes risk, ramipril was studied for diabetes prevention in the DREAM (Diabetes Reduction Assessment with Ramipril and Rosiglitazone Medication) trial. There was no additive effect of therapy in participants who were randomly allocated both ramipril and rosiglitazone.A post hoc analysis of data from a study of coronary artery disease prevention suggested that statins might have diabetes-prevention benefits. Preliminary investigation of incretin-based therapies (e.g. exenatide and dipeptidyl pepti-dase IV inhibitors) suggests these agents not only enhance insulin secretion, but also promote cell proliferation. These agents might, therefore, be suitable for diabetes prevention, but clinical trials will be needed.

MECHANISMS OF DIABETES PREVENTION

In the DPP, both the intensive lifestyle intervention and metformin increased insulin sensitivity. Intensive lifestyle intervention was more effective than metformin in slowing progression to diabetes, partly because lifestyle modification gave greater improvements in insulin sensitivity and beta-cell function. Similarly, in the DPP and TRIPOD (Troglitazone in Prevention of Diabetes) studies, improvements in both insulin sensitivity and beta-cell function explained the observed reduction in progression to diabetes seen with troglitazone.

Table 2 Randomized clinical trials of medications used in diabetes prevention.

Study	Number of patients by study group	Study population	Duration of intervention (years)	Medication	Cumulative incidence of T2DM in controls	Risk reduction (95% CI)
DPP Research Group (2002)	1,073 active 1,082 placebo	IGT BMI 34 kg/m^2	2.8	Metformin 850 mg twice daily	28.9%	31% (17–43%)
Ramachandran *et al*. (2006)	133 active 136 control	IGT BMI 26 kg/m^2	2.5	Metformin 250 mg twice daily	55%	26% (19–35%)
Wenying *et al*. (2001)[37]	88 active 85 control	IGT BMI 25 kg/m^2	3.0	Metformin 250 mg three times daily	11.6% per year	77% (NR)
DPP Research Group (2005)	585 active 582 placebo	IGT BMI 34 kg/m^2	0.9	Troglitazone 400 mg once daily	12% per year	75% (NR)
Buchanan *et al*. (2002)	133 active 133 placebo	Former GDM IGT (n = 167) BMI 30 kg/m^2	2.5	Troglitazone 400 mg once daily	30% (12% per year)	50% (28–89%)
Gerstein *et al*. (2006)	2,365 active 2,634 placebo	IGT, IFG or both BMI 31 kg/m^2	3.0	Rosiglitazone 8 mg once daily	25%	62% (35–46%)
Chiasson *et al*. (2002)	714 active 715 placebo[a]	IGT BMI 31 kg/m^2	3.2	Acarbose 100 mg three times daily	42.0% (12.4% per year)	25% (10–37%)
Wenying *et al*. (2001)	88 active 85 control	IGT BMI 25 kg/m^2	3.0	Acarbose 50 mg three times daily	11.6% per year	88% (NR)
Torgerson *et al*. (2004)	1,640 active 1,637 placebo[b]	IGT (n = 694) BMI 37 kg/m^2	4.0	Orlistat 120 mg three times daily	14.2%	IGT 52% All 41% (NR)
Heymsfield *et al*. (2000)	359 active 316 placebo	IGT (n = 120) BMI 36 kg/m^2	2.0	Orlistat 120 mg three times daily	7.6%	40% (NR)
Bosch *et al*. (2006)	2,623 active 2,646 placebo	IGT, IFG or both BMI 31 kg/m^2	3.0	Ramipril 10 mg once daily	18%	9% (0–20%)

[a]This study had a 25% drop-out rate. [b]This study had a 50% drop-out rate. Abbreviations: DPP, Diabetes Prevention Program; GDM, gestational diabetes mellitus; IFG, impaired fasting glucose;IGT, impaired glucose tolerance; NR, not reported; T2DM, type 2 diabetes mellitus.

Prevention versus masking of incident diabetes

Whether the antidiabetic medications used for prevention truly prevent disease development or merely mask its presence is unclear. This issue has been addressed most directly in the DPP, in which a formal 1–2 week washout period was employed following completion of the initial randomized, double-blind trial. When an oral glucose-tolerance test (OGTT) was performed after washout, diabetes was more frequently diagnosed in metformin recipients than in placebo recipients. Even when these new cases of diabetes were included, however, the overall incidence of diabetes was still reduced by 25% in metformin-treated patients, which suggests that the benefit of metformin was not limited to its acute pharmacologic effects. Similar results were noted with acarbose in the STOP-NIDDM trial. In the TRIPOD study of women with a history of gestational diabetes, 84 women were followed up for less than 1 year after drug discontinuation, during which time seven new cases of diabetes developed. Six of these cases occurred in the former placebo group and one in the former troglitazone group. These findings were interpreted as evidence for a persistent drug effect. By contrast, in the DPP, the diabetes incidence in the former troglitazone group was almost identical to that in the former placebo group after drug withdrawal, and remained so during 3 years of follow-up. Results of long-term follow-up of individuals treated with rosiglitazone in the DREAM trial have not yet been published.

Vascular outcomes

Despite substantial evidence for the effectiveness of both lifestyle change and medications in the prevention of diabetes, few data are available on the delay or prevention of vascular outcomes of diabetes. Acarbose treatment in the STOP-NIDDM trial was associated with a 49% reduction in patients' relative risk of cardiovascular events , although the number of events was small. A reduction was also seen in the risk of hypertension. The other diabetes-prevention trials that are large enough to detect differences in low-frequency events have not yet reported vascular outcomes. However, in the DPP, improvements in various risk factors for cardiovascular disease, including serum lipids, C-reactive protein and fibrinogen, were seen with intensive lifestyle intervention and, to a lesser extent, with metformin. The incidence of metabolic syndrome was reduced by 41% in the lifestyle modification group and by 17% in the metformin group, compared with its incidence in the placebo group.

Insights from genetic studies

The role of TCF7L2 polymorphisms in the development of diabetes has been confirmed. Furthermore, the association between the TT allele of the single-nucleotide polymorphism rs7903146 and decreased beta-cell function was established. Metformin and the DPP intensive lifestyle intervention both had protective effects against the development of diabetes in those with high-risk alleles. Similar results with respect to diabetes risk, insulin secretion and the effects of lifestyle modification were also obtained in the Finnish DPS.

Translational studies

Clinical trials that proved the effectiveness of lifestyle interventions in reducing diabetes risk were designed from the outset as efficacy trials. As such, they were conducted in resource intensive settings with limited consideration as to how the intervention strategies might be adapted for population-wide use. Studies to investigate strategies for translating the findings of these efficacy trials into the public-health arena are in their infancy. Most of the studies combine dietary and exercise strategies as the basis of their interventions and use quasiexperimental designs for evaluation. Some community-based studies that preceded randomized clinical trials such as the DPP and DPS focused on implementation of school-based programs designed to increase physical activity and improve health awareness in young people. Results of these studies were varied, but suggested that these interventions improved participants' knowledge about healthy lifestyle choices and increased their adoption of risk-reducing behaviors, although effects on diabetes development have not been reported.

COST-EFFECTIVENESS OF DIABETES PREVENTION

The economic evaluation performed by the DPP Research Group concluded that the DPP interventions would be cost-effective from societal and health-system perspectives. Another analysis, however, suggested that such programs are too expensive for widespread implementation. This question is, therefore, difficult to resolve with currently available data.In India, preventive lifestyle or metformin interventions were deemed cost-effective, and might similarly be cost-effective in other developing countries. A systematic review of T2DM prevention strategies published in 2006 concluded that the interventions were highly cost-effective, but noted that this interpretation was based on very few studies.

PREVENTION VERSUS EARLY DETECTION AND TREATMENT

Debate prevails about whether resources (human and financial) would be better spent on T2DM prevention or on its early detection and treatment. Early detection is feasible through use of the same simple tests used in prevention programs, and could be done much more economically than attempting to prevent diabetes at the population level. A major drawback of this approach, however, is that many people will have already developed macrovascular disease before diagnosis.

RECOMMENDATIONS FOR CLINICAL PRACTICE

Application of the research findings requires identification of individuals who are at risk of developing diabetes. Screening for prediabetes should be considered in people aged 45 years and older, and for adults younger than 45 years who are overweight or obese and have additional risk factors, such as a family history of diabetes, prior gestational diabetes or belonging to a high-risk ethnic group. Measurement of

fasting plasma glucose levels will identify individuals with impaired fasting glucose, but an OGTT is necessary to identify impaired glucose tolerance. Impaired fasting glucose and impaired glucose tolerance are considered to confer equivalent increases in risk for the development of diabetes; the combination of impaired fasting glucose and impaired glucose tolerance confers a greater increase in risk than either variable alone. Strategies that employ measurements of fasting glucose and routine clinical variables to identify high-risk individuals have been proposed and have the advantage of not requiring administration of an OGTT. Such management algorithms seem to be capable of discriminating between individuals with varying levels of diabetes risk in clinical practice. Lifestyle modification, including a weight-loss goal of 5–10% of initial weight and moderate-intensity physical activity for 30 min per day, can provide the greatest reduction in diabetes risk. This approach has an excellent safety profile and might also be the most cost-effective intervention. The role of pharmacologic agents is somewhat less clear. However, substantial evidence supports the use of metformin in patients who either fail to achieve these lifestyle goals or who have additional risk factors at baseline (such as both impaired fasting glucose and impaired glucose tolerance, a strong family history of diabetes, dyslipidemia, or hypertension), especially if they are younger than 60 years and have a BMI of 35 kg/m or greater. Acarbose might be considered for these patients, but it is less well tolerated and more expensive than metformin, and requires three doses daily. Although effective, routine use of thiazolidinediones cannot currently be recommended because of their high cost and emerging evidence of adverse effects.

Source: The prevention of type 2 diabetes. Jill P Crandall, William C Knowler, Steven E Kahn et al. Nature clinical practice endocrionology & metabolism. July, 2008, Vol 4 No 7.

Congratulations !

The Winners of diabetes Quiz Competition

Vol. 7 No. 1, Feb-April 2009

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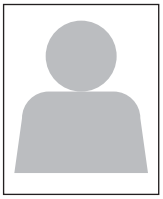

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Editorial Note:
Dear Doctor,
This issue of your diabetes newsletter is focused on "The prevention of type 2 diabetes". We appreciate your comments and queries. Please participate in quiz competition & win prizes.

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