An exploration of evidence-based nursing in the management and prevention of cardiovascular risk in patients with type 2 diabetes

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The world is facing an increase in diabetes. Approximately 347 million people worldwide currently have diabetes\(^1\) and this figure is set to almost double by 2030. In Ireland there are over 12,000 adults diagnosed with diabetes annually,\(^2\) with roughly 23.5 per cent undiagnosed.\(^3\)

Those diagnosed with diabetes are at a much higher risk of developing cardiovascular disease (CVD). Smoking, hypertension and an increased body mass index (BMI) are all independent risk factors for cardiovascular disease and when combined with Type 2 diabetes mellitus (T2DM), these risk factors increase the patient’s risk of developing CVD by 13 per cent.\(^4\)

This paper aims to explore the management and prevention of the cardiovascular risk involved with patients with type 2 diabetes. To do this, this paper will explore the role of the nurse in managing and preventing hypertension, and his/her role in assisting patients at risk for, and with, T2DM to lose weight and stop smoking. It will also examine the role of the nurse in providing...
diabetes self-management education to enable T2DM patients to take an active and informed role in the management of their condition.

Smoking, diabetes and CVD
Smoking increases the risk for hypertension and dyslipidaemia in all patients, but especially in patients with diabetes. Smoking also increases the patient risk of developing CVD, however as the patient with diabetes already has a fourfold increase in developing CVD, a patient who smokes and has diabetes has even larger risk of developing CVD.

Cardiovascular disease is a well documented risk of smoking, but there is also an increased risk for developing T2DM in heavy smokers. For this reason smoking cessation should be included in all diabetes prevention methods also. Smoking cessation should be undertaken in line with strategies for diabetes prevention and early detection, as smoking cessation can increase the short-term risk of T2DM.

Smoking cessation should be encouraged to prevent CVD, but it can also help to reduce HbA1c. Cigarette smoking also exacerbates renal injury in patients with T2DM, but cessation can slow down the damage to the kidneys.

Fagard and Nilsson state that smoking cessation should be one of the main targets for preventative efforts carried out by the primary care team. Smoking cessation can be, and should be, facilitated by nurses in general practice as they have the closest contact with the patient with diabetes, and can follow guidelines and protocols well. Persson and Hjalmarson showed that nurse led smoking cessation techniques (such as smoking cessation group sessions, individual support and follow up phone calls...
at 3,6 and 12 months after the quit date) were 33 per cent more effective than standard smoking cessation techniques.¹¹

Nurses should incorporate support on weight management into smoking cessation programs for all patients,¹² but especially for patients with T2DM. Pasternak et al state, “Despite its status as a powerful risk factor for CVD, [in patients with diabetes] cigarette smoking remains one of the more difficult factors to modify.”¹³ This considered, behaviour change needs to be assessed and encouraged before smoking cessation techniques can be commenced. Nurses should enquire at each clinic visit if the patient is a smoker and use motivational interviewing to assess if they are ready to stop smoking.

**Hypertension**

Hypertension is another serious condition that can lead to cardiovascular disease. Hypertension in patients with diabetes leads to an increased risk of CVD, substantially increasing the risk of morbidity and mortality by up to 75 per cent.¹⁴ Hypertension is defined as BP of >140/90 mmHg. The prevalence of HTN is beginning to stabilise due to prevention and control measures,¹⁵ however, according to Simonson, it is 1.5-2 times more prevalent in diabetics, and affects between 20-60 per cent of patients with diabetes,¹⁶ therefore the need for early prevention and management is huge.

As well as increasing the risk for CVD and other macrovascular complications, hypertension can also contribute to the microvascular complication associated with diabetes such as peripheral vascular disease and retinopathy. All patients with T2DM should be screened for hypertension at every clinic visit and should be monitored with 24-hour ambulatory blood pressure monitor prior to commencing treatment.¹⁷ Tight blood pressure control reduces the risk of diabetes related complications¹⁸ and especially the risk of CVD in diabetics.¹⁹

**Blood pressure control**

Efforts should be increased to detect and manage diabetes and hypertension before irreversible organ damage occurs and to provide patients with the best possible, but affordable treatment.²⁰ The target BP for diabetics is lower than that of the average patient, <130/80 mmHg, due to the higher risk of CVD in patients with diabetes. As 39 per cent of patients with diabetes have hypertension at the time of diagnosis,²¹ it is essential that BP control is tackled early on in the diagnosis of T2DM. The UKPDS showed that each 10 mmHg decrease in systolic BP was associated with 12 per cent reduction in the risk for any complication related to diabetes, 11 per cent reduction in myocardial infarction, and a 13 per cent reduction in microvascular complications. Some research points to a 50 per cent reduction in the incidence of CVD in T2DM patients where tight BP control is in place.²² The greatest way to control diabetes and hypertension is prevention, early detection and fast management.

As primary health care is the first level of contact for many patients, there is an urgent need for addressing the burden of HTN and diabetes mellitus.²³ It has been noted that when trying to control hypertension in the primary care setting patients should be seen every two weeks in order to produce a fast and
effective reduction in blood pressure levels. It is not financially feasible for the patient to see the GP every two weeks, therefore the practice nurse is the obvious alternative.

Nurse led management
There has been some debate on the effect nurses have on patient BP. Opsteen and Oakeshott et al found that most studies on BP control showed that “nurse led management...had little or no effect on blood pressure.” Other studies have found evidence that showed improved blood pressure control with nurse-led interventions with people with diabetes. In all of these studies nurses followed a strict algorithm and gave detailed education to their patients on self-management of diabetes and hypertension. Some 90 per cent of patients monitored by a nurse in primary care reached their BP target of <130/80mmHg. This is mainly due to the fact that nurses treat hypertension in diabetics more aggressively than GPs in primary care.

The National Institute for Health and Clinical Excellence (NICE) guidelines provide threshold and target levels for both drug therapy and lifestyle interventions in hypertension, which nurses can use as a treatment plan for patients. Lifestyle counselling in the primary care setting is strongly linked to better control of hypertension and is largely the job of the nurse in the primary care setting. The America Diabetes Association (ADA) recommends that all patients with Stage 1 hypertension (130-139/80-89 mm Hg) should be given lifestyle and behaviour therapy alone by the nurse for a maximum of three months. If target levels are not achieved at the end of the three months, treatment with pharmacologic agents is recommended. When treating patients for hypertension it is important that the nurse enquires about salt usage and the adherence to medication regimes. In patients who have impaired glucose tolerance or pre-diabetes, intensive lifestyle modification slows the onset of diabetes. The nurse in the primary care setting is in a position to educate the patient on healthy eating and lifestyle interventions in order to prevent hypertension.

Weight management
Weight loss should be one of the key areas of interest when it comes to diabetes management and prevention as 39 per cent of the Irish population is overweight and 25 per cent are obese. It has been shown that for every 1kg of weight gain there is a 9 per cent increase in the prevalence of diabetes and it is well established that a raised BMI increases the possibility of developing T2DM, hypertension and CVD as well as a host of other health complaints.

Anderson et al show that people who are obese are 90 times more likely to develop T2DM than people who have a BMI of <25. For this reason alone health practitioners need to be promoting weight loss for their patients. This is especially urgent in the primary care setting as the primary care team usually have the most contact with patients who have not yet been diagnosed with a chronic health condition.

For those already diagnosed with T2DM, weight loss can dramatically improve glycemic control and can, in 50 per cent of cases, cause a remission in diabetes. For those with hypertension, a weight loss of 4.5kg has been proven to reduce relative risk for hypertension by 65 per cent. Even a 10 per cent weightloss improves blood pressure co-morbidity risks dramatically. The ADA recommends that patients with pre-diabetes (or impaired glucose tolerance) participate in a program with the goal of weight loss of 7 per cent of body weight and an increase in physical activity to at least 150 minutes per week of moderate activity.

Practice nurse role in weight loss
Nurses have an important role to play in helping their patients to lose weight and maintain a healthy weight in order to both prevent and manage diabetes. Nurses can assist obese patients to lose weight and therefore avoid chronic disease by identifying risky lifestyle behaviours and help to develop a plan for improvement strategies.

Weight management programs in the primary care setting are highly cost effective. Nurses may help T2DM patients with weight loss by keeping in regular contact with them after giving lifestyle and dietary advice in the primary care setting. Nurses can help patients to remain motivated through weekly telephone interventions. Wu et al show that patients benefit from weekly telephone calls from the nurse when trying to lose weight.

Nurses should encourage their patients to be physically active. The WHO suggest 30 minutes of physical activity a day to prevent diabetes from occurring, but state that more physical activity is needed for weight control. When giving education to newly diagnosed patients about diabetes it is important that the nurse refers them to a structured diabetes program such as CODE or EXPERT where they can learn about healthy eating and its relationship to diabetes in a group environment.

In order to help prevent weight problems and T2DM, nurses are encouraged to promote healthy family lifestyle
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patterns and they should encourage parents in particular to lay healthy foundations for their children with regards to weight management. Obesity is the most modifiable risk factor for the development of T2DM in children and young adults. The size of daily meals and portion sizes should be discussed with parents and indeed with all patients, providing samples of healthy menus.

Patients are usually more likely to listen to the nurse when given advice on diets and exercise as the nurse has more time to spend with them than the GP. Patients are usually more satisfied with the counselling that they receive from nurses in the primary care setting than from GPs.

When giving advice on diet and exercise to patients it is important to remember that too much information can be daunting and can sometimes turn patients away from the healthy path. In such cases nurses may suggest minor changes in diet to bring about results. For instance, consuming 50 calories less every day, exercising for 15-20 minutes every day or increasing energy expenditure by 100 calories per day, can sometimes result in a weight loss of 5 kg in a year or in stabilising the desired body weight.

Diabetes self-management education

Diabetes self-management education (DSME) is a critical element of care for all people with diabetes and those at risk for developing the disease. The American Diabetes Association describes DSME as:

“The ongoing process of facilitating the knowledge, skill and ability necessary for pre-diabetes and diabetes self-care.”

Patients with diabetes in Ireland usually see a health professional on average three hours per year and have to self-manage their condition for the other 8,762 hours of the year.

Educating patients about diabetes has an important role in encouraging and supporting them to assume responsibility for the day to day control of their diabetes. Self-management education is necessary in order to optimise the health of diabetes patients and minimise the risk of complications. These complications can cost the government up to €4,934 per patient per year.

Irish education programmes

In Ireland, three structured education programmes are offered to patients with Type 2 diabetes in order to stem the cost of complications and improve patient knowledge of their condition.

The programmes offered are: CODE (Community Orientated Diabetes Education), DESMOND (Diabetes Education and Self Management for Ongoing and Newly Diagnosed Diabetics) and X-PERT. The national standards suggest that all people with diabetes in Ireland should receive care that encourages self-management, however, just over half the population of newly diagnosed diabetes patients receive structured education programmes.

Structured education programs encourage weight loss, a decrease in HBA1C and LDL cholesterol and a reduction in BP. All necessary components in reducing the risk of complications related to diabetes. The DESMOND program has shown improved weight loss, rates of smoking cessation and self-reported depression. The CODE education program consists of a diabetes nurse specialist and a dietitian delivering education in the community. Patients are often referred to these education programs, or made aware of them, through their GP or practice nurse. Training is provided to practice nurses to become ‘Structured Education Providers’ or ‘Point of Service Educators’ (POSE) so that they can teach their diabetes patients self-management techniques on a one-to-one basis. They can also become group facilitators and provide group education in their practices locality. Siminerio et al showed that providing DSME in primary care with a POSE is feasible and reached patients who were not receiving DSME services through structured education programs such as X-PERT through the hospitals.

Several studies showed nurse led DSME is associated with improved glycemic control. Kengne et al showed a significant improvement in blood pressure control with nurse led DSME.

There is ongoing debate as to whether self-management strategies for T2DM are as effective as usual care. Sperl-Hillen et al (2013) show that while there were improvements in diabetes management they were not sustained over time, patients may need ongoing reinforcement to achieve lasting behavioural change and glucose control. For this reason it is important that
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"The moment I picked it up I knew what to do." *
practice nurses are trained in DSME so that they can reinforce the necessary information at each yearly diabetes review.

Conclusion

Smoking, hypertension and increased BMI are all independent risk factors for CVD and when combined with T2D, these risk factors increase the patient’s risk of CVD by 13 per cent. In primary care, the practice nurse is often the person who sees the T2DM patients more regularly and therefore can assess the patients level of readiness to change lifestyle habits.

The role of the nurse in smoking cessation includes assessing the patient’s readiness to stop smoking, helping the patient to choose the method of smoking cessation and encouraging their continuing progress through telephone consultations.

The practice nurse’s role in hypertension prevention and management lies in identifying hypertension thorough screening patients with T2D at every clinic visit and promoting a healthy lifestyle. The nurse usually has more time with the patient than the GP and can counsel the patients on the importance of lifestyle changes at every opportunity. The practice nurse has the time to set targets and support patient goals by regular follow-up whether in the clinic or through telephone consultation.

Weight management is one of the most important areas of diabetes care for both the prevention of diabetes and the reduction of complications associated with diabetes. For this reason the nurse’s role in weight management is to encourage the patient to eat a healthy balanced diet and live a healthy lifestyle in order to achieve a weight loss of 7-10 per cent to reduce the risk of developing diabetes and to improve BP and glycemic control, thereby reducing the risk of diabetic complications.

All of the above changes can be implemented through structured education programs designed to teach the patient diabetes self-management techniques.

References