Compare and contrast biomedical and complementary treatment of diabetes mellitus type 2

In this essay I will attempt to compare and contrast the biomedical and complementary treatment of a chosen disease. In this instance, I have selected diabetes mellitus type 2. This disease is related to lifestyle and is becoming more prevalent in Australia generally. It is a major cause for concern amongst people who may be less active, overweight and ageing, but more and more it is affecting younger people from all walks of life and it is taking its toll on people within my own community of Glenbrook in the lower Blue Mountains.

Population make-up of my local area:
The area chosen for this submission is Glenbrook, a small community located in the lower Blue Mountains, which is 70 km west of Sydney's CBD. According to the Australian Bureau of Statistics Census taken 8 August 2006, my local area's population total was 5,997 persons. The total number of males was 2,970 (49.5%) and females 3,027 (50.5%). At the time of the census, this included 38 indigenous persons representing 0.6% of the population of Glenbrook.

The most significant groups by age in descending order are 2,494 persons aged between 25 and 54 years, 726 persons aged between 55 and 64 is and 645 persons 65 years of age and older. The median age of the population is 37. Persons aged 55 years and over make up 22.9% of the population.
Current major health concern in my local area

As stated in the introduction, the disease I have selected for this essay is diabetes mellitus. I will be focussing on diabetes type 2 (also known as non-insulin dependent diabetes). The statistics show that middle aged and older persons have a higher risk of developing type diabetes type 2. In the past 10 years there has been a significant increase in the prevalence of this disease (ABS National Health Survey: Rising prevalence of Diabetes between 1995 and 2004-05) refer chart 2 in appendix.

The majority of Glenbrook's population is aged 25 and over. People 55 years and over represent 22.9% of this population. In 1999-2000 the Australian Diabetes, Obesity and Lifestyle study estimated type 2 diabetes in Australians aged 25 years of age and older to be 7.2%. This figure increases exponentially as a person ages.

Diabetes has increased in all age groups above 44 years, and was highest in the 65-74 year age group (14%). The number of people aged 65 years or more reporting type 2 diabetes has more than trebled between 1995 to 2004-05. As a result, the proportion of people aged 65 years and over reporting diabetes increased from 9% in 1995 to 14% in 2004-05, (ABS National Health Survey 1995 and 2004-05: Persons with Diabetes) refer chart 1 in appendix. According to the Australian Bureau of Statistics Census the proportion of the total Australian population with reported diabetes mellitus increased between 1995 and 2004-05 (rate ratio of 1.5) with the most prevalent form (83%) reported in 2004-05 being type 2 diabetes; however these figures exclude undetected incidences of this disease.

>From the ABS 2003 Survey of Disability, Ageing and Carers, it was estimated that about 357,000 persons with a disability had diabetes (approximately 9% of all persons who reported a disability). Of these, about 86,000 reported diabetes as their main disabling condition (ABS 2004). In 2004, diabetes was a major cause of death in Australia (AIHW 2006a). The mortality rate for diabetes as multiple cause of death is 55 per 100,000. Refer chart 3 in

appendix.

Health services available and/or lacking in my local area
Locally, Glenbrook has one medical practitioner in the village surgery. In the adjoining suburbs of Blaxland and Emu Plains there are several general medical practices. Doctors specialising in most modalities are located in the Nepean Valley in close proximity to the Nepean Hospital which is a teaching hospital of the University of Sydney for medical students and also provides nursing and allied health training for many other universities.

Nepean Hospital is a 420-bed major referral hospital situated at Kingswood at the base of the Blue Mountains. Services include maternity, gynaecology, neonatal intensive care, emergency, diagnostics, paediatric, surgical, intensive care, coronary care, rehabilitation and mental health. Residents of Glenbrook and suburbs located in the lower to mid mountains would usually access the services of the Nepean Hospital, which is part of the Sydney West Area Health Service. It is located 12 km from Glenbrook (approximately 20 minutes by car).

Complementary services in Glenbrook include a full time Naturopath/ Homoeopath, remedial massage, counseling and psychology services at the Glenbrook Wholistic Health Centre. The health food shop has a visiting naturopath, an iridologist and a foot reflexologist for which consultation appointments can be made on certain days of the week. There is also a podiatrist located in the village centre.

There are a wide variety of complementary therapists in the surrounding areas of Penrith, Blaxland, Springwood and Glenmore Park. These include naturopaths, homeopaths, osteopaths, a colon hydrotherapist, massage therapists, some traditional Chinese herbalists and acupuncture clinics.

Health services for major area of health concern:
Nepean Hospital offers a diabetes service via their Acute Interventional Medicine Network. Working in partnership with the specialist diabetes clinic at Westmead Hospital, it provides specialist medical services with a focus on optimising diabetes care, screening for, and treating complications of diabetes. Doctors in the clinic work closely with diabetes educators, dieticians, and podiatrists.

Biomedical disease concept of diabetes type 2 including latest research:
Diabetes is a metabolic disorder and chronic condition resulting in various complications. The disease develops when there is too much glucose (sugar) in the blood and the body is unable to produce enough insulin to break it down, or the body fails to respond to the insulin that the body produces. Insulin is a pancreatic hormone which assists in the utilisation of glucose which is the body's mains source of energy. Some sufferers produce enough insulin, but their target cells become less sensitive to it due to down-regulation of insulin receptors.

Type 2 diabetes (also known as non-insulin dependent diabetes mellitus) is the most common form of diabetes and is usually age and lifestyle-related. People who are overweight are more susceptible, however there are some risk factors associated with family history or ethnicity. Poor diet and nutrition and low birth weight are contributing factors. (AIHW 2004).

Tortora & Derrickson (2006) state that diabetes is more prevalent in persons aged 45 and over, but with the increase in obesity rates in childhood and adolescence, the incidence of type 2 diabetes in obese children and teenagers is increasing.

Signs and symptoms of diabetes type 2:
The onset of type 2 diabetes can be slow and insidious. Sufferers are not usually aware they have the disease; in fact it is estimated that approximately half who have the disease are undiagnosed. The following indicators may give cause for concern and would necessitate further medical examination; excessive thirst (polydpysia), increase in frequency of urination (polyuria), lethargy, constant tiredness, irritability, blurring of vision, tingling or numbness in extremities - especially the feet, skin infections, slower healing of wounds/infections, excessive weight gain or unexplained weight loss.

Some diagnosed type 2 diabetics need insulin, according to Tortora and Derrickson, 2006 p. 660. If too much insulin is injected, this may result in hypergylycaemia (insulin shock), and can ultimately result in an untimely death. Hypoglycaemia, or low blood glucose levels can occur in type 2 diabetics, which results in anxiety, sweating, tremor, increase in heart rate, hunger and weakness, and eventually results in disorientation, convulsions or seizures and shock.

Untreated type 2 diabetes damages small (microvascular) and large (macrovascular) blood vessels. This may lead to complications such as blindness (diabetic retinopathy), kidney damage (nephropathy), nerve damage (neuropathy), cardiovascular disease, stroke, limb amputation and impotence due to reduced blood flow and nerve supply to peripheral parts of the body.

Biomedical approach-rationale and treatment of diabetes type 2:
Significant health risk factors involved in the onset of type 2 diabetes include age (more prevalent for persons over the age of 45 and increases exponentially as age increases), being overweight or obese, excessive consumption of alcohol, smoking and low levels of, or no regular exercise. Diabetes contributes to chronic illness, disability, poor quality of life, psychological distress and premature death, especially if it is undetected or poorly controlled.

The biomedical approach for dealing with overweight or obese patients who show symptoms as mentioned above and, who are suspected of having type

2 diabetes, in summary, would initially be a blood test which would incorporate the measurement of fasting lipids and blood sugar levels. Once diagnosed, the patient's weight, height, BMI, waist circumference and blood pressure would be measured. There would be a recommendation to lose weight, cut down on smoking and alcohol and increase physical activity. The patient would be advised to pay close attention to their feet. The doctor may follow up the patient who has commenced intervention measures, and refer patients who are unable to comply with suggested lifestyle changes to other health professionals e.g. a dietician for diet modification and obesity management and/or recommend that the patient see a podiatrist to monitor foot complications.

Screening for diabetic eye disease is an important measure in the management of symptoms of type 2 diabetes. In a recent review of the different methods of monitoring the development of diabetic retinopathy, Servier (2008) indicated that 'the most effective method is retinal photography combined with mydriasis (pupillary dilatation).'

For patients whose disease can no longer be controlled by weight management and exercise, it must be managed with the aid of an antidiabetic agent. Cefalu (2007) states '…the provider who cares for subjects with type 2 diabetes can choose an antidiabetic agent….that increases insulin secretion, improve insulin action, and delays absorption of carbohydrates….. The currently available agents can be combined and combination therapy markedly improves glycaemic control. This allows the provider to design regimens to specifically address underlying abnormalities.'

According to the Natural Medicines Comprehensive Database, commonly used conventional hypoglycemcic agents for the treatment of diabetes include Chlorpropamide (Diabinese), Glimepiride (Amaryl), Glipizide (Glucotrol), Glyburide (Diabeta, Micronase), Nateglinide (Starlix), Repaglinide (Prandin), Tolazamide (Tolinase) and Tolbutamide (Orinase). Insulin sensitizers include Metformin (Glucophage) and Pioglitazone (Actos) Rosiglitazone (Avandia) and finally carbohydrate absorption inhibitors include Acarbose (Precose) and Miglitol (Glyset). New biomedical treatments have recently been developed such as 'Pramlitide', a synthetic amylin hormone that regulates the appearance of glucose following meals.
Edelman (2006) states that diabetes treatment has traditionally focused on correcting insulin deficiency…The more recent view of diabetes as a disease that affects multiple hormones in addition to insulin has led to the development of new therapies more broadly aimed at restoring glucose homeostasis by correcting abnormalities in additional glucoregulatory hormones.

Complementary medicine disease concept of type 2 diabetes:
Ethically and legally, most professional complementary health practitioners who suspect their client is suffering from diabetes would advise them to seek biomedical analysis first, and if required, they would be expected to

commence an appropriate biomedical treatment plan. Once a patient has been diagnosed and confirmed as a sufferer of type 2 diabetes, practitioners would seek to strengthen and support the sufferer in a wholistic manner. They would suggest the patient lose weight, provide nutritional and diet modification advice, design an appropriate supplementation strategy and advise the client to reduce contributing factors to their disease such as smoking and alcohol consumption. Newstead Wholistic Medicine (c. 2007) states that Nutrition Medicine utilises comprehensive dietary and nutrient supplement programs in the treatment of disease and maintenance of health. It is a relatively new modality that involves a detailed assessment to determine individual metabolic requirements.

Complementary treatment approach – rationale and treatment of type 2 diabetes

The Australian National Health survey states; of persons reporting diabetes, 68% used pharmaceutical medications for that condition, and 4% used vitamin or mineral supplements or herbal or natural medicines.

The National Centre for Alternative Medicine, which is operated under the auspices of The National Institutes of Health, Maryland, USA, emphasise the importance of not replacing scientifically proven treatments for diabetes with complementary treatments that are unproven. The consequences of not following one's prescribed medical regimen for diabetes can be very serious, even life-threatening. Bearing this advice in mind, we can now discuss some complementary approaches which have been successful in the treatment of, or have proved useful in the support of, sufferers of type 2 diabetes.

Complementary health practitioners and nutritionists are aware of the benefit of certain vitamins and mineral supplements, along with herbal medicines, that can be used as an adjunct in the treatment of type 2 diabetes. These include chromium which helps to regulate blood sugar levels; vitamin B complex which helps to produce the enzymes that convert glucose to energy and may also aid in preventing diabetic nerve damage; flaxseed which contains essential fatty acids that protect against nerve damage and assist arterial blood flow. Zinc and copper are essential minerals that aid in the repair of wounds. Magnesium and omega-3 fatty acids have also proven beneficial.

Antioxidants vitamin C and vitamin E along with phytonutrients in bilberry help protect the nerves, eyes, and heart; and taurine may improve insulin sensitivity and decrease cholesterol level. Coenzyme Q10, a vitamin-like substance and antioxidant, has shown to assist cells in the production of energy. Free radicals are known to cause cell damage as high levels of blood glucose cause oxidative stress. Studies show that alpha-lipoic acid, is a useful antioxidant in the prevention of cell damage. It reduces pain, burning, itching, tingling, and numbness in people who have nerve damage (called peripheral neuropathy) caused by diabetes and it speeds the removal of glucose (sugar) from the blood. It may also prevent kidney damage associated with diabetes.

Garlic, containing the enzyme allicin, has been traditionally used as a supplement as it has been observed that the rates of certain diseases, including diabetes, are lower in countries where more garlic is consumed. Cinnamon in the diet has shown to be beneficial. Anderson et al. (2004) states 'that a preliminary clinical study suggested Cassia cinnamon (Cinnamomum aromaticum) could lower fasting blood glucose by 18% to 30%. Polyphenolic polymers found in cinnamon may function as antioxidants, potentiate insulin action, and may be beneficial in the control of glucose intolerance and diabetes.'

A category of foods containing polyphenols (also available as extracts) may be of benefit in the treatment of diabetes, including green tea (epigallocatechin gallate), dark chocolate (epicatechin), and for sufferers who are fond of red wine, studies have shown the compound Resveratrol, found in the skin of red grapes and cranberries, activates the mitochondria causing cells to burn more energy than normal. Resveratrol has also been produced by chemical synthesis, and is sold as a nutritional supplement. Resveratrol is a well-tolerated approach to treat common metabolic diseases, such as obesity and type 2 diabetes.

A traditional Chinese medicine known as Yu Xiao San 8805, containing the herbs Ramulus Euonymi Alatae, Niu Bang Zi (Fructus Arctii Lappae), Wei Ling Xian (Radix Clemetidis Chinensis), Di Gu Pi (Cortex Lycii Chinensis Radicis), E Zhu (Rhizoma Curcumae Zedoariae), Jie Geng (Radix Platycodi Grandiflori), Li Zhi He (Semen Litchi Chinensis) and Ren Shen (Radix Ginseng) has been shown to effectively lower blood-sugar levels and increase insulin secretion. It regulates carbohydrate metabolism, improves blood circulation, lowers blood cholesterol and increases immune response.

Ayurvedic treatments include fasting, diet modification, internal cleansing, exercise, meditation and personalised treatments based upon a body typing system. Ayurvedic herbal supplements include Jambhul (Eugenia jambolana), Sagar gota (Ceasalpinia crista), Bel (Aegle marmelos), Shilájit., Turmeric, Neem, Triphala and Gurmar (gymnema sylvestre), which is claimed to raise insulin levels. Containing saponins and flavonoid compounds including kaempferol and quercetin, the leaves, when chewed, interfere with the ability to taste sweetness, which explains the Hindi name gurmar—"destroyer of sugar".

Discussion of current treatment options:
Type 2 diabetes contributes significantly to the burden of illness in the community and may be prevented or delayed by lifestyle interventions. However, as diabetes is a complicated disease, there are significant problems associated with the self-management, measurement of compliance and metabolic control outcomes in its treatment. Brennan (accessed online 8 March 2008) states that 'Diabetes mellitus causes numerous difficulties for those who adopt a biomedical health education/promotion approach.'

Diet, weight management and exercise, is the most common approach adopted by both biomedical and complementary health professionals in the treatment of diabetes. Medicine Australia (2008) states that 'evidence shows that a realistic and modest 5-10% weight loss is associated with significant health benefits in the treatment of diabetes type 2.' Treatment options depend on the type and severity of the diabetes. Generally the biomedical approach is to advise the patient to lose weight and maintain a healthy BMI, follow a diabetic diet, and partake in regular exercise. If blood sugars continue to be elevated, then, oral medications are used. If oral medications are insufficient, intravenous insulin medications may become necessary.
The University of Sydney's Institute of Endocrinology and Diabetes Unit, have summarised their approach to diabetes; current research is focussing on the identification of risk factors for microvascular diabetes complications, the examining of the genetics of diabetes complications, the application of emerging diabetes technologies, particularly insulin pump therapy and continuous glucose monitoring, along with community-based study of insulin resistance associated with obesity.

Similarly, complementary health practitioners would assess their client's environment and lifestyle, and usually advise that the patient lose weight, reduce their intake of alcohol and to partake in regular exercise. Additionally, they may recommend treatments and/or supplements that would support and strengthen the body. There are a wide variety of complementary approaches and treatments, purported to be very effective in the treatment and support of sufferers of type 2 diabetes.

Conclusion:
In conclusion, both the biomedical and complementary treatment of diabetes mellitus type 2 is similar in their initial approach, focussing on lifestyle and diet modifications, weight management and exercise, however medical practitioners focus mainly on the diseased state and the treatment of its complications, whereas most complementary health professionals would treat the person in a wholistic manner. They would individualise a treatment plan, providing additional support to the patient with specific dietary supplementation, without intentionally interfering with the recommended biomedical treatment plan. Consequently, sufferers of diabetes type 2 may benefit from a treatment regime incorporating both a complementary and biomedical treatment rationale; which in turn may reduce or possibly negate the need for aggressive biomedical intervention and bring about a better prognosis for the sufferer and ultimately, ensure better quality of life.

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