

Macrobiotics and the Management of Diabetes

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This paper was presented and discussion at the International Macrobiotic Conference in Berlin 1st November 2017.

Abstract

Explore the potential of applying macrobiotics as a holistic intervention for the prevention of diabetes, reversing pre-diabetes and helping patients with diabetes reduce the risk of complications.

Introduction

Macrobiotics is a healthy, holistic lifestyle with a focus on nutrition from natural whole foods, whilst including exercise, movement, meditation, mindfulness, strategies for good sleep and various practices to develop a positive attitude to life.

These qualities are particularly helpful in the control of blood glucose making macrobiotics a useful holistic therapy for people with diabetes. Macrobiotic teachers, health coaches, cooks and consultants have the potential to help patients with diabetes, better control blood glucose through their many collective years of experience in cooking high fibre healthy foods.

Main Body

Definition of Macrobiotics

For this paper I have used the name, *Macrobiotics*, to define the subject. Macrobiotics derives from Greek, meaning living a big life. I am applying it as a set of lifestyle changes that help us develop ourselves during our lifetime. Macrobiotics has had an emphasis on holistic health as described by the founder, George Ohsawa in his Seven Levels of Health.¹

Current Measurement of Diabetes

Blood glucose is monitored by devices that are typically used to prick a finger and provide a blood glucose reading. As blood glucose changes throughout the day, there are

¹ Herman Aihara, 'The Seventh Condition of Health', *Kaleidoscope* December 1980.

various protocols for taking readings. For example these can include 2 pre prandial and 2 post prandial readings with a reading before sleep during a week.²

Every 3 months a blood test can reveal the average blood glucose through a blood analysis known as HBA1c.³ Much research on blood glucose control is in terms of HBA1c readings. These can be in % or mmol/mol. A conversion tool is [here](#). HBA1c readings below 6% are considered normal, 6% to 6.4% are considered pre-diabetic and 6.5% or over diabetic.⁴

When working with diabetes patients it is helpful to be able to understand and work with their measurement protocols and understand their targets. As diabetes is largely a painless condition, patients may only have these values to work with to delay the onset of complications.⁵

Pre-diabetes (HBA1c of 6.0% to 6.4%) is considered potentially reversible with appropriate changes to nutrition and lifestyle. Generally, people with pre-diabetes form a much larger cohort than those patients with type 2 diabetes. For example, in the US this group is considered to be approximately 3 times larger than those with type 2 diabetes.⁶

Diabetes Complications

Although patients with well managed blood glucose can lead a normal life there are risks that after 13 to 21 years a patient with diabetes will be prone to various medical complications.⁷ The most common diabetes complications are heart disease, heart attacks, eye issues (Cataracts and retina) as well as kidney disease (Albuminuria) requiring dialysis.⁸ The slow progression of diabetes suggests that recently diagnosed elderly patients may die of other issues before the onset of complications, however,

² Joslin Diabetes Center, *Monitoring Your Blood Glucose*, 2017. http://www.joslin.org/info/monitoring_your_blood_glucose.html

³ Diabetes.co.uk, *Guide to HbA1c*, <http://www.diabetes.co.uk/what-is-hba1c.html>

⁴ *Ibid.*

⁵ Diabetes.Co.UK, 'Type 2 Diabetes Symptoms', <http://www.diabetes.co.uk/type2-diabetes-symptoms.html>

⁶ Phillip Tuso, MD, FACP, FASN, 'Prediabetes and Lifestyle Modification: Time to Prevent a Preventable Disease', *The Permanente Journal* 2014. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4116271/>

⁷ Jose Leal, Alastair M. Gray, and Philip M. Clarke, 'Development of life-expectancy tables for people with type 2 diabetes', *European Heart Journal* 2009 Apr; 30(7): 834–839. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2663724/>

⁸ UK Prospective Diabetes Study (UKPDS) Group, 'Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33)', *The Lancet*, volume 352, No9131p837–853, 12 September 1998. [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(98\)07019-6/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(98)07019-6/abstract)

younger patients with diabetes have a much greater potential to develop complications if their blood glucose, weight and blood pressure are not well controlled.

The UK Prospective Diabetes Study (UKPDS) study found that a 1% reduction in HBA1c from 7.9% to 7.0% reduced the risk of complications by the following;⁹

- 12% for any diabetes related endpoint
- 10% for deaths related to diabetes
- 25% for microvascular endpoints

DCCT and EDIC: The Diabetes Control and Complications Trial and Follow-up Study, found that intensive control of blood sugar by keeping HBA1c readings close to 6% had the following reduction in risk;¹⁰

- 76% reduced risk of eye disease
- 50% reduced risk of kidney disease
- 60% reduced risk of nerve disease
- 42% reduced risk of any cardiovascular disease event
- 57% reduced risk of nonfatal heart attack, stroke, or death from cardiovascular causes

It should be noted that keeping HBA1c close to 6%, increases the incidence of potentially dangerous hypoglycaemic episodes.

These research projects suggest that good blood glucose control reduces the risk of complications.

In addition, according to UKPDS a tight blood pressure control in patients with hypertension and type 2 diabetes achieves a further reduction in the risk of deaths related to diabetes complications.¹¹

- 24% reduced risk of diabetes end points.
- 32% reduced risk of diabetes related deaths.
- 44% reduced risk of strokes.
- 37% reduced risk of microvascular end points.
- 34% reduced risk of retinopathy.
- 47% reduced risk of visual acuity.

⁹ UKPDS

¹⁰ 'DCCT and EDIC: The Diabetes Control and Complications Trial and Follow-up Study', U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES National Institutes of Health, *NIH Publication No. 08-3874* May 2008. https://www.niddk.nih.gov/about-niddk/research-areas/diabetes/dcct-edic-diabetes-control-complications-trial-follow-up-study/Documents/DCCT-EDIC_508.pdf

¹¹ Robert Turner, Rury Holman, Irene Stratton, Carole Cull, Valeria Frighi, Susan Manley, David Matthews, Andrew Neil, Heather McElroy, Eva Kohner, Charles Fox, David Hadden, and David Wright. 'Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38'. *BMJ* 1998; 317. <https://doi.org/10.1136/bmj.317.7160.703>

Progression of Diabetes in the UK

A report published in the journal *Diabetic Medicine* has projected that the National Health Service's (NHS) annual spending on diabetes in the UK will increase from £9.8 billion to £16.9 billion over the next 25 years, a rise that means the NHS would be spending 17% of its entire budget on the condition.¹²

The report also quantifies the current costs of direct patient care for diabetes (which includes treatment, intervention and complications) and indirect costs of diabetes, such as those related to increased death and illness, work loss and the need for informal care, and also predicts the UK's future costs of diabetes. According to the report, the total cost associated with diabetes in the UK currently stands at £23.7 billion and is predicted to rise to £39.8 billion by 2035/6.

According to the report there are currently around 3.8 million people living with diabetes in the UK and, by 2035/6, this is expected to increase to 6.25 million. This report describes a rise in diabetes that is common in many developed or developing countries.

Preventing Diabetes and Reducing the Risk of Complications

The advice for reducing the risk of complications, reversing pre-diabetes and preventing diabetes are broadly similar. Reduced risk in complications are correlated to reductions in HBA1c. This can be achieved through medication, food,¹³ exercise,¹⁴ reduced stress,¹⁵ and good sleep.¹⁶

Food, exercise, reduced stress and good sleep combine to reduce blood glucose spikes and therefore reduce the need for medication. A more stable blood glucose makes it easier to maintain low HBA1c readings and find the correct requirement for insulin. It is important to note that holistic interventions will often reduce the requirement for

¹² 'NHS spending on diabetes 'to reach £16.9 billion by 2035'' *Diabetes UK* 21 August 2017 https://www.diabetes.org.uk/about_us/news_landing_page/nhs-spending-on-diabetes-to-reach-169-billion-by-2035

¹³ Mohammad Asif 'The prevention and control the type-2 diabetes by changing lifestyle and dietary pattern' *Journal of Education and Health Promotion* 2014 Feb 21. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3977406/>

¹⁴ 'Diabetes and Exercise'. *Diabetes.Co.UK*. <http://www.diabetes.co.uk/exercise-for-diabetics.html>

¹⁵ 'Stress and Blood Glucose Levels'. *Diabetes.Co.UK*. <http://www.diabetes.co.uk/stress-and-blood-glucose-levels.html>

¹⁶ Kristen L. Knutson, PHD,¹ Eve Van Cauter, PHD,¹ Phyllis Zee, MD, PHD,² Kiang Liu, PHD,³ and Diane S. Lauderdale, PHD⁴ 'Cross-Sectional Associations Between Measures of Sleep and Markers of Glucose Metabolism Among Subjects With and Without Diabetes'. *Diabetes Care*. 2011 May. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3114508/>

medication and this must be assessed and monitored by taking more frequent blood glucose readings to avoid hypoglycaemic episodes. Additionally, these interventions can reduce blood pressure and cholesterol which further reduces the risk of complications.

George Oshawa developed a list of essential components of health between 1941 and 1962 known as the Seven Levels of Health.¹⁷ In a modern context these can be expressed as;

1. Energy - Have vitality and the ability to engage in exercise, movement and activities.
2. Appetite - Enjoy simple, whole, natural, healthy plant based foods.
3. Sleep - Benefit from a full nights, deep sleep and feel refreshed when waking.
4. Memory - Ability to remember names, thoughts, ideas, events and be able to discuss these without requiring notes or a mobile phone.
5. Good humour - Live with deep appreciation and free from anger or stress.
6. Smart Thinking - Apply common sense, be alert, able to respond quickly with deep thinking and create order around us.
7. Justice - Ohsawa described this as living with the visible and invisible worlds, combining spirituality with materialism. He gave examples; Living in harmony with nature, with a sense of freedom, in pursuit of personal dreams, with the highest values in life, honestly and never meeting someone he or she does not like.

The four essential lifestyle influences for diabetes, exercise, nutrition, sleep and less stress can be found in Ohsawa's Seven Levels of Health. The 7th level makes a reference to being holistic and developing an integrated approach to life. This suggests that better results come from combining improvements to, exercise, diet, sleep and reduced stress.

Patient Action Plans and Protocols

Macrobiotic protocols for patients with diabetes would include;

1. Exercise - To enjoy daily aerobic exercise to moderate blood glucose increase and keep the cardio vascular system healthy.¹⁸ At the same time muscle building resistance exercises will develop muscles, or reduce deterioration with age, so that the body has a greater capacity to use up excess glucose through exercise.¹⁹
2. Nutrition - To help patients adopt a high fibre, low added sugar, appropriate calorie and low GI diet. Fibre is one of the main components in slowing the absorption of

¹⁷ Herman Aihara, 'The Seventh Condition of Health', *Kaleidoscope* December 1980. Page 80 to 81.

¹⁸ Sheri R. Colberg, PHD1, Manuel J. Hernandez, MEng and Fatima Shahzad, BS. *Diabetes Care* 2013 Oct 'Blood Glucose Responses to Type, Intensity, Duration, and Timing of Exercise' <http://care.diabetesjournals.org/content/36/10/e177>

¹⁹ Jiandie Lin. 'Lift Weights To Lower Blood Sugar? White Muscle Helps Keep Blood Glucose Levels Under Control'. *Life Sciences Institute. University of Michigan* Apr 8, 2013. <http://www.lsi.umich.edu/newsevents/discoveries/2013-04-07>

calories from food, leading to slower increases in blood glucose.²⁰

This confirms the macrobiotic principle of eating primarily whole foods (whole grains instead of processed grains), vegetables and fruits with their skins on, and unprocessed foods straight from the land such as beans, nuts and seeds.

Macrobiotics uses common sense principles to help balance calorie intake with gender, age, climate, weather and lifestyle. At the same time raw foods, and foods cooked for shorter times at lower temperatures are lower in the GI.²¹

It may help to eat 5 small meals daily to spread the exposure to calories.

Nutritional strategies need to be in place to resolve the onset of hypoglycaemic events by quickly creating a healthy food to boost blood glucose.

3. Sleep - To use meditation, warm evening drinks, avoid exposure to blue screens in the evening,²² limit exposure to EMF in the bedroom,²³ using black out screen to darken bedrooms,²⁴ daytime physical activity to enhance sleep and reduce exposure to caffeine.

²⁰ Martin O. Weickert* and Andreas F. H. Pfeiffer. 'Metabolic Effects of Dietary Fiber Consumption and Prevention of Diabetes'. *The Journal of Nutrition* 15 October 2007. <http://jn.nutrition.org/content/138/3/439.long>

²¹ Gabriele Riccardi, Angela A Rivellese, and Rosalba Giacco. 'Role of glycemic index and glycemic load in the healthy state, in prediabetes, and in diabetes'. *American Society for Clinical Nutrition* 2008. <http://ajcn.nutrition.org/content/87/1/269S.full>

²² University of Haifa. "Blue light emitted by screens damages our sleep, study suggests." ScienceDaily. ScienceDaily, 22 August 2017. <www.sciencedaily.com/releases/2017/08/170822103434.htm>.

²³ Halgamuge MN. 'Pineal melatonin level disruption in humans due to electromagnetic fields and ICNIRP limits'. *Radiat Prot Dosimetry*. 2013 May. <https://www.ncbi.nlm.nih.gov/pubmed/23051584>

²⁴ Joshua J. Gooley Kyle Chamberlain Kurt A. Smith Sat Bir S. Khalsa Shantha M. W. Rajaratnam Eliza Van Reen Jamie M. Zeitzer Charles A. Czeisler Steven W. Lockley. 'Exposure to Room Light before Bedtime Suppresses Melatonin Onset and Shortens Melatonin Duration in Humans'. *The Journal of Clinical Endocrinology & Metabolism*, Volume 96, Issue 3, 1 March 2011, Pages E463–E472. <https://academic.oup.com/jcem/article-lookup/doi/10.1210/jc.2010-2098>; G M Brown, 'Light, melatonin and the sleep-wake cycle', *J Psychiatry Neurosci*. 1994 Nov; 19(5): 345–353. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1188623/>

4. Stress - To employ the regular daily practice of meditation and mindfulness,²⁵ take healthy perspectives of life, become solution orientated, engage in positive thinking and develop practical strategies to avoid recurring patterns or behaviours that lead to stress.
5. Holistic - To integrate 1 to 4 into a practical holistic approach, according to the patients abilities, to help manage and control blood glucose. For example postprandial exercise to reduce blood glucose rise or meditation before sleep to reduce stress and improve sleep.

Conclusion

There is general scientific and medical agreement on the changes that are required to manage blood glucose and the macrobiotic community is in the position to be able to offer practical advice on how to make changes in nutrition, exercise, sleep and achieving less stress to better control blood glucose, along with reduced cholesterol and blood pressure.

This places macrobiotic practitioners in a beneficial position to help people who are at higher risk of type 2 diabetes whether through hereditary risks factors, ethnicity, excess weight, or lifestyle, prevent diabetes. Further a macrobiotic lifestyle has all the components to help reverse pre-diabetes and help control blood glucose so that patients with diabetes can reduce the risk of complications.

If we take the publication of George Ohsawa's *Zen Macrobiotics* in 1960 as the wider introduction of macrobiotics in the west, macrobiotic practitioners have a 57 year experience in cooking and eating a diet made up of vegetables, whole grains, beans, nuts, seeds, fruits, herbs, mild spices, fermented foods, desserts with no added refined sugar, and teas. When combined with their experience in helping patients achieve good sleep, exercise and practices that reduce stress such as meditation or mindfulness, there is a considerable collective practical knowledge and experience that is ideal to help patients with pre-diabetes or diabetes.

²⁵ [Elizabeth A. Hoge](#), M.D., [Eric Bui](#), M.D., [Luana Marques](#), PhD, [Christina A. Metcalf](#), B.A., [Laura K. Morris](#), B.A., [Donald J. Robinaugh](#), M.A, [John J. Worthington](#), M.D., [Mark H. Pollack](#), M.D., and [Naomi M. Simon](#), M.D. 'Randomized Controlled Trial of Mindfulness Meditation for Generalized Anxiety Disorder: Effects on Anxiety and Stress Reactivity'. *J Clin Psychiatry*. 2013 Aug; 74(8): 786–792. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3772979/>; 'Mindfulness, Blood Pressure and Blood Glucose levels'. *Diabetes.Co.UK*. <http://www.diabetes.co.uk/emotions/mindfulness-blood-pressure-and-blood-glucose-levels.html>

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About the Author

Simon Brown was director of London's Community Health Foundation 1986-1993, is the current chair of the Macrobiotic Association, author of *Modern Day Macrobiotic* and *Macrobiotics For Life*, helped organise international conferences for Macrobiotic Teachers since 2007. Simon worked with Diabetacare from 2015 to 2017 helping to introduce holistic interventions to patients with diabetes through training Diabetes Specialist Nurses as Diabetes Health Coaches. He also project managed the development of a diabetes health coaching app to help patients manage and track their blood glucose.

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Discussion Notes from the Presentation of this Paper at the International Macrobiotic Conference in Berlin 2017.

It was recognised the macrobiotics has a useful role to play in helping people control their blood glucose and that diabetes is one of the key health issues of our time.

It was agreed that coming together to help people with diabetes would encourage us to be a more outward facing community that was focussed on being in service to others and be of value to society.

It was agreed that members of the conference would come together to write up protocols using those that Simon had created during his work with Diabetacare as a starting point. Those participating in this project are;

Denny Waxman
Melanie Brown Waxman
Greg Johnson
Isabel Moreno
Mario Lopez
Marco Fonseca
Ana Torres
Trish Dent
Mary Nino

Once we have agreed protocols we will then seek to start pilot studies where we can test the protocols and measure the results. This could be achieved through larger projects with possible funding or through a larger group of macrobiotic health coaches / consultants who find small numbers of patients and we then combine the results into a larger cohort.