



## Antioxidants, Minerals and Vitamin Supplements in Diabetes

Lij Zou\*

Department of Chemistry, University of Dongguan, Dongguan, China

### ARTICLE HISTORY

Received: 01-Aug-2022, Manuscript No. EJMOAMS- 22-72458;  
Editor assigned: 05-Aug-2022, PreQC No. EJMOAMS- 22-72458 (PQ);  
Reviewed: 19-Aug-2022, QC No. EJMOAMS- 22-72458;  
Revised: 24-Aug-2022, Manuscript No. EJMOAMS- 22-72458 (R);  
Published: 02-Sep-2022

### Description

Dietary antioxidants are thought to have a protective effect against the development of diabetes by inhibiting peroxidation chain reactions. It seems plausible that adequate intake of antioxidants plays an important role in protecting against type 2 diabetes.

It is common knowledge that diabetes is a risk factor for cardiovascular diseases [1,2]. While micro vascular complications of diabetes include nephropathy and retinopathy. Macro vascular complications leading to atherosclerotic cardiovascular diseases, such as coronary artery disease, cerebrovascular disease, and peripheral vascular disease, are the leading cause of death in the diabetic population [3]. The Diabetes Control and Complications Trial (DCCT) demonstrated that tight blood glucose control is effective in significantly reducing clinical complications, but even optimal blood glucose control cannot prevent complications, suggesting the need for alternative treatment strategies.

Numerous animal studies have shown that Thiazolidinedione's (THDs) have antioxidant effects. In one study, urinary isoprostane, a marker of oxidative stress, was reduced in rats treated with pioglitazone [4,5]. Another study using type 2 diabetic rats showed that troglitazone treatment reduced hydroperoxides and reduced SOD activity [6]. A study using troglitazone and pioglitazone in type 2 diabetic rats showed that both drugs reduced TBARS levels and enhanced the aortic vascular response to relaxation.

### Vitamin supplements for diabetes

Vitamins play a key role in glucose metabolism, and deficiencies in these nutrients can make supplements necessary to treat and prevent diabetes-related complications. Due to disorders of glucose metabolism in diabetics, excess production of free radicals occurs. This, in turn, reduces antioxidants in the blood, causing a deficiency in vitamins such as A, C, and E, which are powerful antioxidants. This may require you to load up on vitamins to meet your body's

needs. Some medicines used to treat diabetes can reduce the absorption of vitamin B9 (folic acid) and vitamin B12. Therefore, if you have been taking diabetes medication for a long time, you may also need to take supplements.

**Vitamin A:** The active form of vitamin A is retinol, which is a powerful antioxidant that not only helps manage stress, but also improves pancreatic cell function. This is important because the cells of the pancreas produce insulin.

**Vitamin E:** Taking vitamin E supplements in people with diabetes for about 24 months has been found to prevent the development of diabetic complications. These include complications such as diabetic retinopathy, foot ulcers, and cardiovascular problems. Moreover, taking vitamin E slows the development of complications in people with uncontrolled diabetes.

### Mineral supplements for diabetes

Minerals play an equally important role in the management and treatment of diabetes. This is because a lack of minerals can disrupt glucose metabolism, increasing the risk of health complications. In fact, diabetics often suffer from low levels of magnesium and zinc.

### Antioxidants for diabetes

Hyperglycaemia, or high blood glucose, can lead to auto-oxidation of glucose with the formation of free radicals. Excess free radicals in the body can lead to vascular damage and dysfunction of blood vessels and neurons, increasing the risk of diabetic neuropathy. Antioxidants help scavenge free radicals, thereby reducing the risk of complications. Consuming antioxidants such as vitamin C and Alpha-Lipoic Acid (ALA), either through natural food sources or supplements, can help prevent the risk of diabetic complications. This makes them useful in the treatment of diabetes. ALA is a powerful antioxidant that lowers fasting blood glucose, reduces oxidative stress, and reduces insulin resistance. However, this supplement should be used with caution as it can cause a sharp drop in blood glucose levels.

## References

- [1] Pyörälä K, Laakso M, Uusitupa M. Diabetes and atherosclerosis: an epidemiologic view. *Diabetes Metab Rev.* 1987; 3(2):463-524.
- [2] Laakso M. Hyperglycemia and cardiovascular disease in type 2 diabetes. *Diabetes.* 1999; 48(5):937-42.
- [3] Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med.* 1993; 329(14):977-86.
- [4] Dobrian AD, Davies MJ, Schriver SD, Lauterio TJ, Prewitt RL. Oxidative stress in a rat model of obesity-induced hypertension. *Hypertension.* 2001; 37(2):554-60.
- [5] Bagi Z, Koller A, Kaley G. PPAR $\gamma$  activation, by reducing oxidative stress, increases NO bioavailability in coronary arterioles of mice with Type 2 diabetes. *Am J Physiol Heart Circ Physiol.* 2004; 286(2):H742-8.
- [6] Fukui T, Noma T, Mizushige K, Aki Y, Kimura S, Abe Y. Dietary troglitazone decreases oxidative stress in early stage type II diabetic rats. *Life Sci.* 2000; 66(21):2043-9.