

Dark Chocolate as a Practical Replacement for White or Milk Chocolate in Patients Coping with Overweight, Obesity, Type 2 Diabetes, and Metabolic Syndrome

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Abstract

Two of the most consequential challenges facing an overweight, obese, diabetic, or metabolic syndrome (MetS) patient are dietary and lifestyle changes. For those patients that regularly consume chocolate or “chocoholics”, physicians and healthcare providers should consider dark chocolate as a practical replacement in overweight, obese, diabetic and MetS patients. Pure dark chocolate has no sugar or milk fat. Also, it is high in antioxidants and flavonols, that have demonstrated benefits to the cardiovascular system, lowering blood pressure, and mitigating the long-term risk of cancer, heart attack, and stroke. This review compares the constituents of the three varieties of chocolate (white, milk and dark chocolate). It presents a case that dark chocolate is the healthier of the three and should be considered a practical replacement for white or milk chocolate in patients coping with overweight, obesity, type 2 diabetes, and metabolic syndrome.

Keywords: *Chocolate; Caffeine; Cardiovascular; Cocoa; Dark Chocolate; Diabetes, Flavon, High Blood Pressure*

Abbreviations

BP: Blood Pressure; HBP: High Blood Pressure; MetS: Metabolic Syndrome; T2DM: Type 2 Diabetes Mellitus; USDA: United States Department of Agriculture

Introduction

Chocolate has a 4,000-years known history. Chocolate, from the cacao bean, originated in Central America where *Theobroma cacao* trees flourished in the region’s tropical climate. The indigenous Kuna people were noted to have a lower incidence of cardiovascular disease than the Western explorers and fortune-hunters; thus, it was surmised that the chocolate drink had health benefits [1,2]. However, it was later determined that the cardiovascular health of the Kuna people was due to the group’s environment and lifestyle, not to their chocolate consumption [2]. The native users of cocoa held that it relieved catarrh and stomach ailments [1].

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The Spanish explorers bore specimens of the crop to Europe. The cocoa bean-derived brew took hold, spreading to Spain, France, and Britain. The original chocolate drink was considered bitter by European standards. Thus, the cocoa-derived drink was mixed with water, honey, and spices to give the drink a more acceptable taste to the Europeans. Eventually, the “chocolate bar” appeared in Britain [3].

While commercial chocolate-producing companies flourished, the medicinal qualities of the cocoa bean or seed were disregarded. Then, natural, unadulterated chocolate was considered healthy; now, the commercial version available worldwide has a high sugar and milk fat content, which can lead to overweight, obesity, type 2 diabetes (T2DM), and metabolic syndrome (MetS) [4].

Chocolate is made from cacao beans or seeds of the *Theobroma cacao* tree. This tree produces large, pod-like fruits, each containing 20–60 beans surrounded by a sticky, sweet-tart white pulp (Figure 1). Generally, “cacao” refers to the pods, beans, and grated contents of the beans; “cocoa” refers to the powder [5].



Figure 1: Cocoa (*T. cacao*), the fruit of *Theobroma cacao* tree. Reproduced from Baharum., et al. (2016) [6].

Discussion

Two of the most significant challenges facing an overweight, obese, diabetic, or MetS patient are dietary and lifestyle changes [7]. For those patients who consume chocolate, replacing white chocolate or milk chocolate with pure dark chocolate or cocoa might be beneficial for weight loss and T2DM, as well as having antihypertension and anticancer effects.

Nutrition facts of chocolate varieties

White chocolate

According to the the U.S. Department of Agriculture (USDA), 25 grams of white chocolate contains the following:

- 146 calories
- 10 grams of fat

- 13 grams of carbohydrates (all from sugar)
- 50 milligrams of calcium

Despite the name, white chocolate is not a typical cocoa-derived substance and contains no cocoa [8].

Milk chocolate

According to the USDA, 38 grams (about three squares) of milk chocolate contains the following:

- 220 calories
- 13 grams of fat
- 21 grams of carbohydrates (of which 19 grams come from sugar)

Due to its milk content, milk chocolate has slightly more calcium per serving (100 milligrams) than dark chocolate. Milk chocolate also contains 1.08 milligrams of iron. Due to its high-sugar and milk powder content, milk chocolate is not regarded as a healthy food [9].

Dark chocolate

According to the USDA, one ounce (28 grams) of 85% dark chocolate contains the following:

- 136 calories
- 14 grams of fat
- 12 grams of carbohydrates
- 1 gram of protein
- 2 grams of fiber

Dark chocolate has no sugar [10].

Considering the constituents of each chocolate variety mentioned above, dark chocolate, derived from the cocoa bean with no added sugar or milk products, is the healthiest of the chocolates and has demonstrated specific cardiovascular benefits [11]. According to Katz, *et al.* (2011), dark chocolate has been associated with lowering high blood pressure (HBP) [3] due to its high flavanol content. Steinberg, *et al.* (2003) noted that flavonols reduce the long-term risk of cancer, heart attack, and stroke [12]. Katz, *et al.* (2011) concluded, the higher the cocoa content of the product consumed, the more flavanols will be available to the body [3]. They also stated that while regular milk chocolate products contain flavanols (from cocoa), the amount is inadequate to influence overall cardiovascular health or BP [3].

Schulte, *et al.* (2015) stated that additives, e.g., sugar and fat used in commercial chocolate production, can create a health risk [13]. High sugar and fat intake, especially combined with a sedentary lifestyle, can lead to overweight, obesity, T2DM, and MetS [14]. Also, some chocolates contain caffeine, which, if consumed in excess, can cause irritability and insomnia. Thus, chocolate consumers should take notice of any co-consumption of other caffeine-containing foods and drinks, such as coffee, tea, and, soda.

The consumption of dark chocolate alone (without other medical interventions and lifestyle changes in overweight, obese, diabetic, or MetS patients) has not been researched adequately [15]. Thus, the consumption of dark chocolate as a sole treatment for such conditions is not advised.

Conclusion

Cocoa and chocolate have a long and ancient history. Of the three chocolate varieties (white, milk and dark chocolate), dark chocolate appears healthier than the other two chocolates. Dark chocolate contains no sugar or milk products; it has been associated with specific cardiovascular benefits, including lower blood pressure. Due to its high flavanol content, dark chocolate may mitigate the long-term risk of cancer, heart attack, and stroke. Dietary and lifestyle changes can be challenging for many patients in need of such. Physicians and healthcare providers should consider dark chocolate as a practical replacement in overweight, obese, diabetic, and MetS patients until they can be weaned from chocolate altogether, while adopting other beneficial dietary and lifestyle changes.

Conflict of Interest Statement

The authors declare that this paper was written in the absence of any commercial or financial relationship that could be construed as a potential conflict of interest.

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