
LETTER TO EDITOR**Zamzam water in diabetes mellitus: Current evidence and future perspectives***Hüseyin Çaksen^{1*}**¹Divisions of Pediatric Neurology and Genetics and Behavioral-Developmental Pediatrics,
Department of Pediatrics, Faculty of Medicine, Necmettin Erbakan University,
Meram, Konya, Türkiye*

Dear Editor,

Diabetes Mellitus (DM), a metabolic illness, is a major public health problem affecting hundreds of millions worldwide [1,2]. Traditional and Complementary Medicine (T&CM) means a form of health-related practices designed to prevent, treat and manage illnesses or preserve mental and physical well-being of individuals, with alternatives and complementary therapies [3]. T&CM use is highly prevalent in patients with DM, ranging from 17% to 72.8%. The most widely used therapies among populations with DM are nutritional supplements, herbal medicines, nutritional advice, spiritual healing and relaxation techniques [4]. Patients with DM using T&CM have found the therapies to be generally helpful [5].

Zamzam Water (ZW) comes from the Zamzam well, located within the Masjid al-Haram in Mecca, Kingdom of Saudi Arabia. ZW is a pathogen-free, natural and alkaline water containing many chemical compounds and elements and has antioxidant, anti-inflammatory and anti-diabetic properties [6]. Drinking ZW is considered an act of worship. People seek both physical refreshment and spiritual upliftment from this sacred water. ZW has healing properties for various illnesses. Furthermore, ZW is for whatever it is drunk for [7]. ZW, a type of T&CM, has been widely consumed by people with various physical, mental and spiritual illnesses for healing purposes for more than 1,440 years. Herein, we discuss use of ZW, a type of T&CM, in patients

with DM to attract attention to the therapeutic feature of ZW.

Although ZW is commonly consumed by patients for healing purposes, there are limited studies on use of ZW in DM in the literature, most of which are on rats. El Maleky *et al.* (2021) reported that ZW significantly decreased streptozotocin-induced hyperglycemia, blood pressure, heart rate, oxidative stress biomarkers, impairment in renal functions, morphological changes in kidney and apoptosis in rats [6]. Likewise, ZW significantly increased insulin levels in both in vivo and in vitro experiments. These effects were more pronounced when used in combination with gliclazide [6]. Additionally, ZW decreased alloxan-induced hyperglycemia in rats [8] and fasting blood glucose, serum insulin, and insulin resistance in healthy rats [9]. Bamosa *et al.* (2013) reported that ZW ameliorated oxidative stress and reduced HbA1c significantly, but not fasting blood glucose in patients with type 2 DM [10].

ZW has been shown to be beneficial for wound healing in DM. Taha *et al.* (2023) reported that combined administration of dapagliflozin and ZW significantly improved wound closure and antioxidant enzyme levels, resulted in marked histological improvement, and shortened the inflammatory phase of diabetic wounds by reducing levels of the inflammatory marker nuclear factor kappa B, tumor necrosis factor alpha, interleukin 1 beta, interleukin

6, and CD45 in streptozotocin-induced diabetic rats [11]. Pribadi (2022) noted that wound irrigation with ZW has been found useful in patients with diabetic foot ulcer [12]. ZW has been effectively used in the treatment of oral complications in patients with DM [13].

ZW has also positive effects on anxiety, depression and osteoporosis in diabetic rats. ZW showed anxiolytic and antidepressant like effects in streptozotocin-induced diabetic rats, targeting oxidative stress, neuroinflammation, brain-derived neurotrophic factor/extracellular signal-regulated kinase /cyclic AMP-response element-binding protein pathway with modulation of hypothalamo-

pituitary-adrenal axis [14]. Recently, Alghamdi *et al.* (2024) reported ZW improved diabetes-induced osteoporosis in rats by enhancing osteoblastic activity and downregulating osteoclastic activity [15].

In conclusion, although limited animal and clinical studies have shown therapeutic potential of ZW on DM, current evidence is insufficient to recommend ZW as a treatment for DM. We recommend that well-designed clinical trials should be conducted to determine the effects of ZW on patients with DM and interaction between ZW and antidiabetic drugs. These studies will fill the gap in the literature.

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***Author for Correspondence:**

Hüseyin Çaksen, Divisions of Pediatric Neurology and Genetics and Behavioral-Developmental Pediatrics, Department of Pediatrics, Faculty of Medicine, Necmettin Erbakan University, Meram, Konya, Türkiye,
Email: huseyincaksen@hotmail.com,
huseyincaksen@erbakan.edu.tr;
Telephone: +903322237104

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