

water beverages during an 18-hole round of golf

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INTRODUCTION

Rarely has the physiology of golf been examined in depth. Wells & Collier (2007: *Golf Nutrition: What to eat before and after you practice and play [Electronic Version]*) give an overview of energy demands along with nutritional and hydration advice, however no results were presented to support these recommendations. In contrast, there is a large body of research into the area of optimal sports drinks (Shirreffs, 2003: *Sportmedizin und Sporttraumatologie*, 51 (1), 25-29). Most of these studies have compared sodium (Na⁺) concentration (Twerenbold *et al.*, 2003: *British Journal of Sports Medicine*, 37, 300-303) or carbohydrate content (Kavouras *et al.*, 2006: *Journal of Applied Physiology*, 100, 442-450). To date, the author is unaware of any published research in the field of hydration for golf. Articles concentrate on hydration in hot climates and/or during intense exercise.

PURPOSE

The purpose of this study was to determine the effectiveness of carbohydrate and/or Na⁺ inclusion in a beverage during an 18-hole round of golf.

METHODS

Following institutional ethics approval, nine male amateur golfers (mean \pm SD; age 20.8 ± 1.9 yrs; stature 180.2 ± 6.7 cm; body mass 76.3 ± 11.0 kg; and handicap 17.5 ± 6.2) participated in a randomised cross-over design in groups of three at least six days apart. During each round participants consumed a different drink; hypotonic (0.5g sodium per litre), isotonic (0.5g sodium, and 6.75g carbohydrate per litre) and water. Nude bodyweight (BW) was measured before commencing the round, after the 9th hole and after the 18th hole. Participants consumed 200 mL immediately after the initial weighing and then 100 mL prior to each tee shot. Heart rate (HR) was monitored throughout.

$$\Delta BW = (\text{pre- BW} - \text{post- BW}) + (\text{urine output} - \text{drink consumed})$$



STATISTICAL ANALYSIS

Repeated measures one way factorial ANOVA with a Bonferroni correction was conducted on each variable.

KEY FINDINGS

No significant differences ($P < 0.05$) were found between isotonic, hypotonic or water beverages for hydration status represented by change in BW (ΔBW), Table 1.

Table 1: BW changes, mean HR and mean urine output for all conditions.

	Hypotonic	Isotonic	Water	Mean
Mean HR (beats·min⁻¹)	108.6 ± 7.8	105.7 ± 6.2	104.3 ± 7.9	106.0 ± 7.3
Mean ΔBW after 9 holes (kg⁻¹)	-0.3 ± 0.2	-0.3 ± 0.3	-0.3 ± 0.3	-0.3 ± 0.3
Mean ΔBW after 18 holes (kg⁻¹)	-0.5 ± 0.3	-0.6 ± 0.3	-0.7 ± 0.4	-0.6 ± 0.3
Shots taken	91.4 ± 8.0	89.9 ± 8.6	89.3 ± 6.8	90.6 ± 7.6
Mean urine output (L)	-1.3 ± 0.6	-1.4 ± 0.7	-1.3 ± 0.5	-1.3 ± 0.6

However, a means plot revealed a trend for ΔBW between the three conditions (Figure 1).

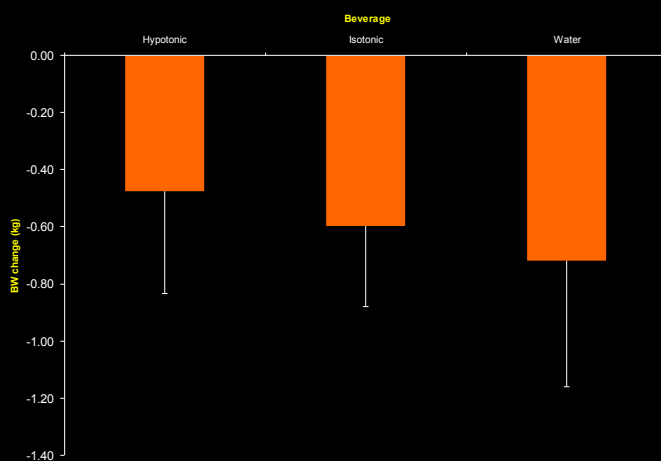


Figure 1: BW change after 18 holes for all conditions.

DISCUSSION

Neither Na⁺, nor carbohydrate was found to have a significant affect on hydration during an 18-hole round of golf.