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The effects of low-fat skim chocolate milk on urinary hydration indices in a sample of Division 1-AA cross country runners during off-season training sessions

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Background

A randomized cross over design study was performed to examine the effects of three different hydration drinks (water, W; gatorade, CHO-E; and low-fat skim chocolate milk, CHC) post exercise in a sample of Division 1-AA cross country runners during off season practice sessions.

Methods

Urine samples were collected from nine cross country runners twice a week (on the intense interval training days each week) for six weeks pre and post practice sessions. Each week participants consumed one of the three rehydration drinks. Participants served as their own control and drink choice was randomized in a cross over design across the three drinks. Urine was tested at four different times on each of the experimental days; (1) before practice (PRE), (2) immediately after practice (IPE), (3) 60 minutes after practice (RECV), (4) and a midnight sample (PST). Four urine indexes were examined on each of the experimental days to assess the difference in hydration status using the three experimental drinks: 1) Urine osmolality[1] (U_{osm}), 2) specific gravity[2] (U_{sg}), 3) volume of urine output[3] (U_o), and 4) urine color[4] (U_{col}).

Results

Rehydration of low-fat skim chocolate milk post exercise exhibited a non-significant decrease (p = .08) of approximately 35% in urine volume output throughout the evening in the CHC group (346 ± 95 ml) when compared to CHO-E (476 ± 188 ml) and W (549 ± 240 ml) groups. Urine osmolality, specific gravity, and color scores gradually decreased across all drinks from 60 minute recovery to nightly urine samples with a more significant drop observed in the control (W) group (p = $.03^{osmo}$, $.01^{color}$) This indicates rehydration occurred after exercise using all the drinks however, it appears a slower rate of hydration occurred in the chocolate milk and CHO-E groups. A secondary finding was a significant correlation did exist between urine osmolality and urine specific gravity (r = 0.83*), while weak non-significant correlations occurred between urine osmolality and color (r = .557) as well as urine specific gravity and color (r = .367).

Conclusion

The results of this study suggest that implementation of a nutrient dense drink (chocolate milk) post exercise will show a non-significant trend to reduce urine output. Due to its high macronutrient and electrolyte content chocolate milk may be a viable way to reduce urine output and increase water retention which may allow one to maintain a more euhydrated state post exercise. It is also concluded the indices of urine osmolality and urine specific gravity indicate a strong relationship as markers of hydration status as opposed to urine color. This information could be

applicable when using different modalities to assess hydration status.

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