

Abstract

Some doctors recommend increased water intake for dry eye with the assumption that body hydration affects ocular hydration, however research is lacking. Tear osmolarity is one of the most sensitive ways to quantitatively evaluate dry eye. Following overnight fasting, we gave a 30-oz water dose and then measured osmolarity at 30 minutes, 2 and 3 hours post-baseline. Osmolarity decreased significantly immediately after water therapy but returned to baseline 2-3 hours post therapy due to homeostatic systems in the body. Short term hydration did not significantly change reported symptoms.

TABLE 1. Subjects.

Number of Subjects	20
Gender	M-7 F-13
Contact Lens Wearers	10
Age Range	20-57
Average Age	32.3
Average BMI	26.218

Introduction

Increased water intake is occasionally recommended to treat dry eye based on a hypothesized mechanism of osmotic balance between blood plasma and tears. Studies imply that drinking water may decrease plasma osmolarity and as a result, tear osmolarity, but research shows that plasma osmolarity is not easily altered short term. Measuring tear osmolarity allows us to assess ocular surface hydration.

Methods

After overnight fasting from food and drink, subjects had baseline tear osmolarity measured for both eyes. They then drank 30 oz of water in 30 minutes. TearLab measurements were repeated at 30 minutes, 2 and 3 hours post baseline. A modified SANDE questionnaire assessing symptoms was given before and after treatment.



FIGURE 1. TearLab collecting a 50-ul tear sample.

Results

Data showed no statistically significant change between baseline tear osmolarity and the 2- and 3-hour post-treatment readings ($p=0.144$ and $p=0.895$ respectively; t-test), however, a significant change was observed between baseline and 30 minutes ($p=0.014$). Reported dry eye symptoms did not show a statistically significant change following treatment.

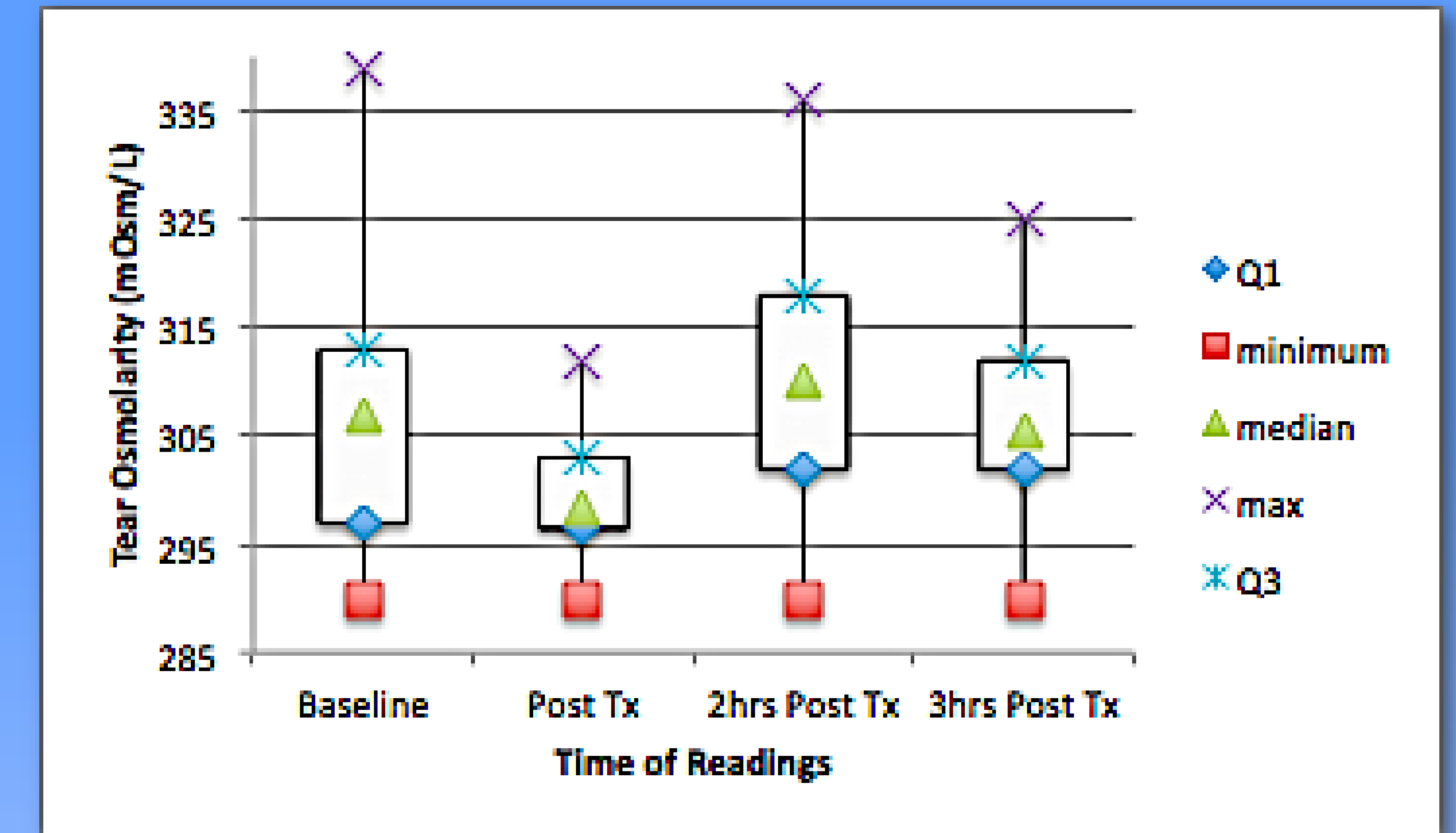


FIGURE 2. Changes in OD/OS max tear osmolarity

Discussion

In our study, short term hydration caused a slight transitory dilution of tears, but by 2 hours post treatment, it had returned to baseline. Subjective symptoms did not change significantly. Studies have shown that physiological systems work quickly to adapt to changes in the body's homeostatic balance in order to keep plasma osmolarity in a narrow acceptable range. Future investigation on symptomatic dry eye patients over a longer treatment period is necessary to better assess whole body hydration as dry eye therapy.

Conclusion

Short term hydration did not cause a lasting change in tear osmolarity or dry eye symptoms.