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EFFECTIVENESS OF THYROID SUPPLEMENT AND TYROSINE IN PREVENTION OF DECREMENTS IN COGNITIVE PERFORMANCE AND MOOD DURING PROLONGED ANTARCTIC RESIDENCE: A RANDOMIZED CLINICAL TRIAL.

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Introduction: The psychological effects of thyroid supplements and tyrosine were assessed in two cohorts of men and women who spent the summer (n=43) and/or winter (N=41) seasons at McMurdo and South Pole stations in 2002-03. **Methods**: At the beginning of the summer (November) and winter (March) seasons, subjects were randomized into 4 groups which received the followed each day: 12 g tyrosine mixed in applesauce (Group 1); 50*u*g of thyroxine and 12.5*u*g of triiodothyronine (Group 2); 12g of cellulose (Group 3); and a placebo capsule (Group 4). Serum samples of thyroid hormones, plasma lipids, catecholamines, and and cortisol were obtained at four different periods (Nov, Jan-Feb, Mar-Apr, and Aug-Sept). Cognitive performance and mood were assessed using the Automatic Neuropsychological Assessment Metrics – Antarctic (ANAM-ICE), a computerized test battery. **Results**: In summer, tyrosine users experienced a significant decline in accuracy, but also a significant increase in response time in performance of complex cognitive tasks and in self-reported happiness compared to the two placebo groups. Tyrosine users were also faster and more efficient in performance of these tasks and reported a significant decrease in depression and anger than those taking thyroid supplements. Levels of catecholamines and TSH declined significantly over the summer in all treatment groups, while the tyrosine users experienced significant declines in cortisol, fT3, tT3 and fT4 and a significant increase in tT4 during this period. In winter, tyrosine users were significantly slower in completing the simple reaction time task, but were significantly happier and less angry than those taking thyroid supplements or placebos. Tyrosine and thyroid supplement users experienced significant increases in fT_3 and significant decreases in TSH during this period compared to the placebo groups. FT_3 was positively correlated with vigor, happiness and cognitive task efficiency and negative correlated with response time, while TSH was inversely correlated with fatigue depression, anger, and anxiety. **Conclusion**: Use of tyrosine resulted in significantly improved mood in both summer and winter and significantly improved cognitive performance in summer. tween speed and accuracy.