EFFECT OF SERUM ELECTROLYTE LEVELS ON EXERCISE ASSOCIATED MUSCLE CRAMPS: A CRITICALLY APPRAISED TOPIC

Pazik, MN*, Cacolice, PA†: *Duquesne University, Pittsburgh PA, †Westfield State University, Westfield, MA

Focused Clinical Question: What is the effect of serum electrolyte levels on exercise associated muscle cramps (EAMC) in endurance athletes? This Critically Appraised Topic (CAT) was conducted utilizing a PICO of P: athlete or active individual, I: serum electrolyte levels, C: no intervention AND control, O: exercise associated muscle cramps.

Data Sources: The PICO question was searched in PubMed, CINAHL, Cochrane Library, and PEDro Database utilizing a Boolean string of: (exercise AND associated AND muscle AND cramp) AND (serum AND electrolyte) for articles published in the last fifteen years. Additional resources were obtained via review of reference lists and hand search.

Study Selection: Inclusion criteria consisted of English-language articles only, with a level of evidence 2 or higher, and limited to endurance athlete participants. Exclusion criteria included active individuals not participating in endurance events, examination of hydration status without quantification of serum electrolyte levels or no use of a control group.

Data Extraction: All three studies included in this CAT measured data detailing serum electrolyte levels relationship to incidence of exercise associated muscle cramps in endurance athletes and pre and post race body weight measurements of endurance athletes.

Summary Measures: All three studies reviewed in this CAT examined statistical associations between incidence of EAMC and serum electrolyte levels. Effect sizes were either reported in the article or were calculated with values supplied in the investigations.

Evidence Appraisal: The evidence was appraised using Levels of Evidence, Centre for Evidence Based Medicine.

Search Results: From the Boolean string search strategy conducted, seven articles were identified. Of the seven articles, only three were included in this CAT based on the inclusion/exclusion criteria. Data Synthesis: When combining all participants in the three selected studies, the number of cramping endurance athletes was 75 with 197 non-cramping endurance athletes. All three studies found no clinically significant differences in serum electrolyte levels between the cramping groups and the non-cramping groups with a p value of <0.05. The Cohen’s d effect sizes in the selected investigations ranged from .222 to 1.180.

Evidence Quality: There was strength of recommendation B that serum electrolyte levels do not effect EAMC in endurance athletes. The three articles selected for this CAT each met Level of Evidence 2b.

Conclusions: From the findings of this CAT we can conclude that there is no association between serum electrolyte concentrations and EAMC in endurance athletes. The use of electrolyte in rehydrating beverages does not result in decrease incidence of EAMC. Further research must determine the aetiology of EAMC.

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