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Relationship between energy-drink consumption and qt-interval changes on electrocardiography: a systematic review

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INTRODUCTION: Energy-drink consumption has increased substantially in recent decades, especially among young people and athletes, because of the drinks' stimulant effects. Concern has also grown regarding their cardiovascular effects, particularly QT-interval prolongation, which is a marker of risk for severe arrhythmias such as torsades de pointes. Studies have reported conflicting findings on this relationship; we therefore proposed a systematic analysis of the available data. **METHOD:** This systematic review used the PRISMA protocol and the PICOS framework to select and analyze studies. PubMed, Cochrane, Scopus, Elsevier, UpToDate, and Google Scholar were searched for clinical trials and experimental and observational studies published from 2014 to 2024 that analyzed the relationship between energy-drink consumption and changes in the QT/QTc interval. Study quality was also assessed using the Cochrane and Newcastle–Ottawa tools. **RESULTS:** Eighty-two studies were identified, of which 12 met the inclusion criteria. Eight studies indicated QT-interval prolongation after energy-drink consumption, seven found no significant change, and only one reported QT-interval shortening. Prolongation was more evident in studies evaluating high doses (>900 mL) of these beverages. **DISCUSSION:** The quantity and quality of the product appear to be the most important factors in energy-drink consumption. Although most healthy individuals do not experience relevant adverse effects, frequent or high-volume consumption may still pose a risk, especially to individuals with heart disease. Despite the difficulty of conducting a more specific analysis of the topic, the findings make clear that consumption may increase the risk of severe arrhythmias. Other factors, including the duration of consumption and monitoring, may also have influenced the results. **CONCLUSION:** Excessive energy-drink consumption may prolong the QT interval and increase the risk of potentially fatal arrhythmias. The findings also demonstrate the importance of new controlled studies to deepen understanding of long-term cardiovascular effects.

KEYWORDS: Energy drinks; QT interval; Electrocardiogram.