

# ST-elevation Myocardial Infarction and Alcohol Mixed with Energy Drink

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## Abstract

Myocardial infarction with ST-elevation related to alcohol mixed with the energy drink has been a challenging condition more frequently among young males under the age of 45 years. Energy drinks are proinflammatory risk factors even in the absence of classical risk factors, and healthcare professionals should pay special attention to this specific factor during the medical history, especially when diagnosing some acute cardiovascular disorders in younger patients. This diagnostic hypothesis is reinforced in cases of myocardial infarction in the absence of the traditional risk factors, and effective measures should be implemented and closely monitored. The purpose of this letter is to comment on some new literature about the challenging issue.

**Keywords:** alcohol, energy drink, AMED, STEMI, myocardial infarction.

## Dear Journal of Clinical Medicine of Kazakhstan Editors,

Episodes of myocardial infarction (MI) with ST-elevation (STEMI) related to alcohol and energy drinks consumption (EDC) may occur in patients under the age of 45, as recently described by Dondurmaci E and colleagues in this Journal [1]. The 19-year-old man without medical antecedents had precordial pain after two days of caffeine energy drinks with alcohol; his electrocardiogram (ECG) revealed ST elevation in the D1, AVL, V5, and V6 leads, and the coronary angiography showed a 99% thrombotic lesion in the distal circumflex artery branch. The result of urine toxicological screening was negative. He initially underwent intracoronary heparin and glyceryl trinitrate (in bolus), followed by the routine schedule with enoxaparin, acetylsalicylic acid, clopidogrel, atorvastatin, and metoprolol, resulting in a good outcome [1]. The follow-ups over two months revealed normal electrocardiograms and echocardiograms. The authors commented on the education of young people and a reduction in energy drinks [1]. The objective of the letter is to present some new bibliographic data on a global concern [2-7]. A 31-year-old asthmatic man with excessive EDC had chest pain, and the inferior STEMI with an elevated

troponin and persistent coronary artery spasm (CAS) refractory to vasodilators, besides right coronary artery and first diagonal branch balloon angioplasty [2]. Initially improved, he presented with hyper eosinophilic syndrome (HES) confirmed by organ biopsies and responsive to corticosteroids; the authors highlighted that STEMI from CAS is an uncommon component of HES, which usually demands the multidisciplinary management [2]. The authors commented on the role of early diagnosis and control of HES in patients with unexplained MI, mainly if related to an EDC, and in the absence of atherosclerotic risk factors. A 26-year-old previously healthy man had an electrocardiographic diagnosis of atrial fibrillation and rapid ventricular response; his blood tests showed elevated thyroid-stimulating hormone and normal free thyroxine levels, with no structural heart disease on chest images [3]. No intracardiac thrombus was seen, and the urine screening test was positive for Amphetamine; the patient returned to the sinus rhythm before the cardioversion procedure that was chosen. The authors emphasized the scarce data about the commonest arrhythmias by the use of the drug, the need to assess the relationship between stimulant medications and atrial fibrillation, and guidelines for prescriptions to patients with some risk for developing atrial fibrillation [3]. In

Malaysia, EDs are often premixed with sexual stimulants and have caused arrhythmias, coronary vasospasm, prolonged QTc interval, spontaneous coronary artery dissection, MI with or without obstructive coronary artery disease (MINOCA), besides cases of cardiac arrest [4]. A 33-year-old male smoker had a sudden transient loss of consciousness, urinary incontinence, chest discomfort, and palpitation after consuming the sexual stimulant Kopi Jantan with coffee, as utilized during the last two years, with increased amounts two months before this event [4]. The ECG showed atrial flutter, and echocardiography revealed normal cardiac chambers; his diagnosis was atrial flutter with rapid ventricular response secondary to ED ingestion; he was successfully managed by intravenous amiodarone in addition to synchronized cardioversion. He was discharged with verapamil to maintain the sinus rhythm with outpatient ambulatory [4]. A 27-year-old male non-smoker had sudden-onset central crushing chest pain radiating to the back, profuse sweating, and vomiting after two years of Kopi Jantan drinks; there was neither use of recreational drugs nor other supplements or herbs, nor family cardiovascular disease [4]. As the ECG revealed ST elevations in leads I, AVL, and V2-V6, he underwent intravenous streptokinase, which resulted in the complete resolution of the ST-segment elevations; other investigations (urine toxicology, autoimmune disease, and infection screening) were negative. Coronary angiography revealed a non-obstructive stenosis in the left anterior descending artery, and as his diagnosis was MINOCA, the acute thrombotic occlusion resolved with thrombolysis; he was discharged on dual antiplatelets and remained well in outpatient clinic follow-ups [4]. A 28-year-old African male with no cardiovascular risk factors had an 8-hour retrosternal chest pain 4 hours after taking 1250 cc of an ED (caffeine, taurine, sugar, and glucuronolactone) [5]. As the electrocardiogram and echocardiogram showed an anterolateral STEMI, and the catheterization revealed a 100% thrombotic occlusion of the proximal left anterior descending artery, his prompt management with success was revascularization and a drug-eluting stent [5]. Considering the overall data indicative of an increasing incidence of ED-associated coronary involvements, the authors called attention to the need to limit the consumption of the beverages. A 19-year-old man with gastroesophageal reflux presented with acute chest pain and had the electrocardiographic and biochemical diagnosis of STEMI, but heart images were normal [6]. He had neither important family medical history nor obvious risk factors for coronary heart disease; he denied smoking and illicit drug use, but had ingested

a large volume of ED in the week before admission. Therefore, the authors strongly believed that this could be the origin of the sudden coronary event, manifested by the central, dull thoracic pain radiating to the right arm, being well-responsive to both the sublingual glyceryl trinitrate and the diamorphine [6]. Aspirin, clopidogrel, ACE inhibitor, and a  $\beta$ -blocker were prescribed to continue on discharge; in the two-month follow-up, he was totally EDs abstinent and had no further thoracic pains [6]. In fact, distinct risk factors are associated with young-onset MI in comparison to older patients, and more attention is necessary on susceptibility factors and preventive measures search [7]. As an example, the very young South Asian people developing early coronary arterial disease, who have many novel evolving risk factors associated with an MI, and need intervention [7]. To reduce morbidity and mortality, one must consider the well-known markers like lipoprotein A, dyslipidemias, or stress, and new risks like periodontitis, micro- or nanoplastics, and ED [7].

New prospective studies may reveal novel risk factors for increased young AMIs, and case reports of STEMIs in young people enhance the awareness of potentially underrecognized triggers of the acute coronary events in patients without traditional cardiovascular risk factors. The data discussed should serve as a key message for physicians, mainly during history taking, risk assessment, and selection of the management options in younger patients with STEMIs.

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