Energy drink overconsumption can trigger atrial fibrillation
Anna V. Mattioli\textsuperscript{a}, Sonia Pennella\textsuperscript{a}, Antonio Manenti\textsuperscript{b} and Alberto Farinetti\textsuperscript{b}

\textsuperscript{a}Department of Life Science and \textsuperscript{b}Department of Surgery, University of Modena and Reggio Emilia, Italy

Correspondence to Anna V. Mattioli, MD, Department of Life Science, University of Modena and Reggio Emilia, Via del Pozzo, 7141100 Modena, Italy
Tel: +0039 59 4224043; fax: +0039 59 4224323; e-mail: annavittoria.mattioli@unimore.it

Received 20 January 2016 Revised 22 March 2016 Accepted 3 May 2016

To the Editor

Many adverse cardiac effects have been reported following energy drinks consumption, among which atrial arrhythmias, acute coronary syndromes, and even cardiac arrest. These can develop also in the absence of other symptoms related to acute toxicity, such as neurological symptoms. Considering the absence of specific toxicological tests, the diagnosis of energy drink intoxication still remains clinical.

We report three cases of tachyarrhythmia from atrial fibrillation in young and healthy study participants following a large intake of energy drinks.

Three young male patients, aged 23, 22, and 26 years, were evaluated for a symptomatic episode of atrial fibrillation occurring in the early hours of the morning (between 6:00 and 10:00 a.m.). All reported arrhythmic palpitations and ECG showed atrial fibrillation with high ventricular response (135–170 bpm mean frequency). In all these patients, a thorough anamnesis disclosed an abundant ingestion of energy drinks within the 8 h prior to the onset of arrhythmia. No other clinical sign was present; in particular, the common toxicological analyses were negative, as were routine laboratory tests.

The cardiac arrhythmia disappeared spontaneously in a short period of time and the follow-up, lasting 2 years in abstinence from energy drinks, was negative.

Retrospectively, we could estimate the total amount of caffeine ingested: it was 125 mg in two patients and up to 80 mg in the third where alcohol intake was associated. The second patient also referred a psychological situation of stress.

We can identify a triad, on which our diagnosis was based: recent abundant consumption of energy drinks, atrial fibrillation with a spontaneous rapid return to a sinus rhythm, absence of other important clinical signs and of abnormalities in the routine laboratory, and toxicological tests.

From a pathophysiological point of view, we can observe that the sole high content of caffeine does not explicate the particular toxicity of energy drinks, which can be referred also to a synergic action of alcohol or of other substances contained in energy drinks, such as taurine, guaranà, ginseng, ginkgo biloba, L-carnitine, glucoronate, B vitamins, etc. Toxicology of these substances is still incomplete;\textsuperscript{1} their action can be enhanced by a condition of psychological stress.

Atrial fibrillation or acute peak of arterial hypertension after energy drink overconsumption can be considered benign complications,\textsuperscript{2–7} whereas in the presence of other conditions such as acute long QT syndrome or angina, they can become more complicated.\textsuperscript{8–14} In the case of pre-existing, often unknown, cardiac diseases, such as channelopathies or latent coronary insufficiency, energy drink abuse can be followed by deleterious consequences, such as cardiac arrest or even death from acute coronary syndromes. This latter risk can be augmented by the energy drinks’ detrimental effects on platelets and endothelial function with secondary hypercoagulability.\textsuperscript{15,16}

The dangers of energy drink overconsumption must be considered in the general medical practice sphere.\textsuperscript{17} In addition to the diagnostic procedure of acute cardiac events of unknown origin, an exogenous agent, including also energy drink overconsumption, can be suspected.

Acknowledgements

There are no conflicts of interest.

References

5 Busuttil M, Willoughby S. A survey of energy drink consumption among young patients presenting to the emergency department with the symptoms of palpitations. Int J Cardiol 2016; 204:55–56.
Letters to the editor  903


DOI:10.2459/JCM.0000000000000416

‘Heart Team’ decision-making for cardiac interventional procedures should take into account patients’ cognitive function and frailty
Gabriele Fragasso
Heart Failure Unit, Ospedale San Raffaele, Milano, Italy

Correspondence to Gabriele Fragasso, MD, Clinical Cardiology – Heart Failure Unit, Istituto Scientifico/Universita’ San Raffaele, Via Olgettina 60, 20132 Milano, Italy
Tel: +39 02 26437366; fax: +39 02 26437395; e-mail: gabriele.fragasso@hsr.i

Received 5 January 2016 Accepted 3 May 2016

To the Editor
International guidelines recommend the utilization of multidisciplinary teams to guide the management of patients undergoing percutaneous cardiac procedures. However, the functioning and composition of such a ‘Heart Team’ vary across and within countries. In the present letter, it is mainly referred to transcatheter aortic valve implantation (TAVI)/replacement, but all considerations can be extended to the whole spectrum of interventional cardiovascular procedures.

After the age of 80, the incidence of dementia is high (http://www.alzheimer-europe.org/Research/European-Collaboration-on-Dementia/Prevalence-of-dementia/Prevalence-of-dementia-in-Europe). The ‘Heart Teams’, which are devoted to the evaluation of candidates for various devices, are not supposed to take into account patients’ cognitive function. For instance, the mean reported age of patients undergoing TAVI is more than 80 years in all registries.1,2 Among those recipient patients around 30% could supposedly be affected by dementia symptoms. Can we really be unaware of this problem? Are we really happy as physicians and sons/daughters, and tomorrow’s patients, to maintain an efficient heart in parallel with an inefficient brain? Or should we introduce a more objective way to evaluate the whole health status in our patients? The following points should be taken into consideration:

1) Preintervention mental capabilities of patients aged 80+ years should be fully investigated. Geriatric syndromes, together with frailty, which are frequently seen in elderly patients and remain important preoperative risk factors, are often not included in surgical risk scores, although frailty is significantly related to functional decline and prognosis. Most geriatricians can accurately identify a frail patient. Therefore, a geriatrician and a neurologist with special skills in the management of frailty and cognitive disorders would be welcome in the ‘Heart Team’.

2) Cultural/skill bias in the presently formed ‘Heart Teams’ is not unfreqently encountered. The clinical cardiologist of the team is usually the referent of the patient. Therefore, he/she, by referring the patient, is originally inclined toward intervention. An independent clinical cardiologist should be included. The other members of the team are usually an interventional cardiologist and a cardiac surgeon: their role in the debate is usually confined to who is going to do the procedure. The imaging specialist just provides the technical information to the former two. Therefore, once the patient case is sent to the judgment of the actual ‘Heart Team’, the patient will anyway receive some kind of interventional treatment.3

3) Apart from the potential trivial gain of the procedure itself in some cases, in some others it could also be rather counterproductive. It has been previously indicated that cognitive functions could be further impaired by procedures like TAVI. Stroke is reported in 3.3 ± 1.8% of patients within 30 days and increasing up to 5.2 ± 3.4% 3.3 ± 1.8% the first year after TAVI.4 Procedural transcranial Doppler ultrasound has been shown to detect embolic signals in a sizeable proportion of patients undergoing TAVI and postprocedural ischaemic brain lesions on MRI are detected in up to 77% of patients.5 Despite technical advancements such as filter protection of the cerebral vessel takeoff, that has been shown to significantly reduce the occurrence of these complications,6 the chance of iatrogenically making worse a preexisting neurological condition is not remote.

© 2016 Italian Federation of Cardiology. All rights reserved.
The prevalence of aortic stenosis is up to 7% of the population past the age of 75 \(^7\) and valve replacement is the only treatment that improves survival and quality of life. \(^8\) However, the increased availability of transcatheter options for the management of valvular heart disease has increased the assessment of people with life-limiting conditions for whom treatment may not be an option. Despite the fact that it may appear as an oxymoron, prolongation of life may not necessarily represent a valuable target in many patients for whom prolonged survival could rather be contraindicated for objective and subjective reasons. Despite palliative care not being considered central in cardiac care, and cardiac patients receive proportionately fewer palliative care services, the integration of best palliative care practices in transcatheter valve disease management programmes could establish a gold standard of programme development, to ensure that patients for whom intervention is not an option do not experience the negative outcome of their eligibility assessment as loss of hope, abandonment, and increased uncertainty. \(^9\)

Ideally, in opposition to the present trend of friendly agreement, very often encountered in Heart Teams, a team producing real dialectical confrontation between members, based on the needs of scrutinized patients, should be implemented. Such a team should comprise the patient’s primary cardiologist, a cardiac surgeon, an interventional cardiologist, an imaging specialists, a heart failure/valve disease specialist, a cardiac anaesthesiologist, a nurse practitioner, and a rehabilitation/geriatrician specialists (eight individuals). \(^10\) Unfortunately, ‘Heart Teams’ are rarely formed as such. \(^11,12\) Keeping in mind organizational difficulties, a less crowded and similarly balanced ‘Heart Team’ could be formed by only four members, with two members culturally biased toward interventions (interventional cardiologist and cardiac surgeon) and two members with opposite attitudes bias (clinical cardiologist/heart valve specialist and geriatrician/neurologist). To avoid bias, members of the team should rotate by drawing lots. Cases of disagreement should be resolved by consensus.

Apart from the potential futility of some interventions, especially in the very old patients, it is important to underline the fact that rising healthcare costs cannot be sustained by public and private insurances over the long term and therefore a careful evaluation of priorities, agreed by patients, doctors, health authorities, and representatives, should be undertaken. It is not possible to guarantee everything for everybody and specific choices have to be made. In the recent past, some hard choices in the oncological setting have been made and are still fiercely debated. However, specific choices should be made in all medical fields and the axiom ‘we can do this, therefore we do it’ should not replace more thoughtful clinical decisions. Despite a ‘Heart Team’ approach not being without multiple potential problems, its implementation has become mandatory and its composition should always reflect the most relevant professional skills on a peer-to-peer basis for better patient and resources management.

### References