

Case Report

Acute MI of Young Age: Unwarranted Dosing of Steroidal and Nutritional Supplementations

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Abstract

Body shaping or body building is obsession of our times. This is achieved with over consumption of proteins, steroids and nutritional supplements. The resulting malnutrition manifest as coronary artery disease which further precipitates myocardial infarction in adults below the age of 40 years. A 25-year male patient was referred to emergency department and was diagnosed with MI- STEMI. He complained of chest pain after a treadmill exercise. He was not a habitual drinker and was performing his routine errands. He was consuming typical self-made and suggested nutritional diet along with whey proteins, fat shredder and anabolic steroids. He received stanozolol 2 ml injection, testosterone 1 mg and triiodothyronine 25 mcg., testosterone and Unwarranted consumption of anabolic steroids and testosterone injections coupled with malnutrition precipitated MI-STEMI. He underwent coronary angiography, echocardiography and was diagnosed with MI-STEMI. His echocardiogram showed ST-elevation in Lead I, aVR and V2-V6. His echocardiogram revealed 44% reduction in left ventricular ejection fraction. He was catheterized after loading with Aspirin 75 mg, Clopidogrel 300mg, Rosuvastatin 40 mg. after balloon angiography he further received Eptifibatide 180 mcg/kg followed by 2 mcg/kg/min as maintain ace dose. He was resuscitated with antiplatelets and statins and was discharged after a few days.

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Keywords

STEMI, Body Building, Anabolic Steroids Abuse, Young Age MI

1. Introduction

Myocardial Infarction is deadly manifestation of coronary artery disease and is now proving fatal for younger population under 40 years [1]. The cut off age for patients with coronary artery disease or patients with MI is 40 or 45 years, as used by majority of studies [2]. Eged et. al classified causes for MI in younger patients into four groups, atheroma associated, non-atheroma CAD, hypercoagulable states and substance

abuse associated MI [3]. prevalence of coronary artery Syndrome in younger age was 5.8 – 7% in previous studies [4, 5]. Sedentary life style, smoking, abnormal lipid profiles, drug abuse particularly alcohol, cocaine and marijuana abuse, family history are risks factors for acute MI in younger age [6].

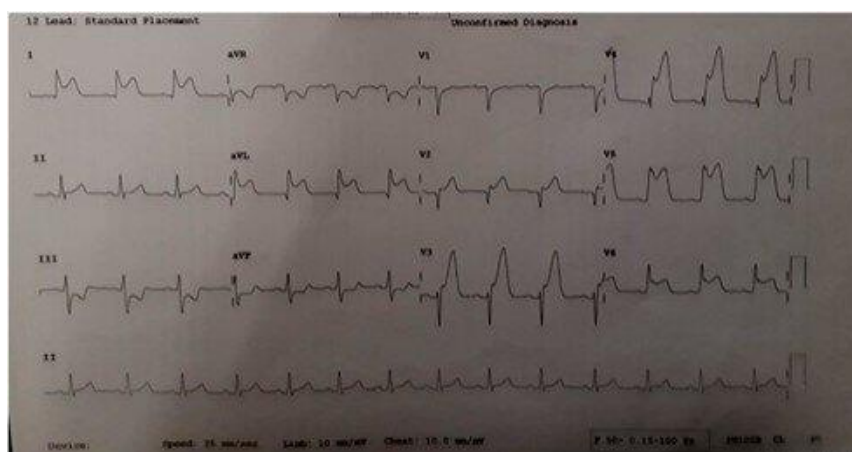


Figure 1. ECG having abnormality at Lead I, aVR and V2-V6.

Body shaping is a global trend now and is founded on rigorous physical techniques and nutritional supplementations to gain muscle mass and body shape [6]. Dietary supplements are common among users from both developed and under developed countries [7, 8]. It is estimated that 90% of athletes consume supplements despite health risks and warning. Trained athletes consume more than normal number of proteins (1.2 – 1.7 g/kg/day), fibers (20-30 g/day) [9]. International society of sports nutrition (ISSN) recommends an objective oriented and timely consumption of nutrients, carbohydrates, proteins, fats, minerals and nutrients according to demand of exercising athlete, the recommendations of whom ignored in large by young aspiring body shaping athletes and industry [10]. Hormonal supplementations are also included to achieve desire goals including testosterone and androgens. Among anabolic steroids, testosterone and stanozolol are commonly abused for this albeit these agents can provide appetite improvement, libido, positive effects on mood and treating hypogonadism. As they are overdosed to achieve quick desire physique [11]. This supraphysiological dosing of

these anabolic steroids as well as proteins and specific amino acids can then potentiate cardiovascular risks by expressing platelet thromboxane A2 receptors and thus a cardiovascular event ensue.

2. Case Report

A 25-year male bodybuilder was presented to emergency department. He was complaining of severe left sided retrosternal chest pain. Pain was radiating to left arm and he was also heavily sweating for 15 minutes and had vomited once while running on treadmill. Patient had no familial history of hypertension, Coronary heart disease, diabetes mellitus type 2 and any other cardiovascular disorder. His life style was not much active and was also not a habitual drinker. He has recently joined gym for body building and his approach was aggressive as he was training 4 hour a day, 2 hr. in the morning and 2 in evening for 3 months. He was using consuming half Kg whey proteins per day, an amount

exceeding manufactures' limit of use. He has also consumed Night shred tm (Inno Supps., US), a fat shredding supplement with Once daily dosing for two months. This allowed him to reduce 5 kg body weight and then he discontinued it. Furthermore, he included Branched amino acid pre- work out powder (Vegan BCCA) which contain L-Leucine (2.7g), L-Isoleucine (1.32g) and L-Valine (1.32g) per 7.5 g scoop. Besides these proteins and nutraceuticals, the steroidal regimen included stanozolol 2 ml injection each week, testosterone 1 ml per week and oral triiodothyronine (T3) 25 mcg daily. His body building diet included boiled chicken 300 g with milk shakes and fruit juices.

Table 1. Diagnostic tests of Bodybuilding Athlete.

Diagnostics	
Thrombocytosis	605000/ μ L
Haemoglobin	15 g/dL
Total Cholesterol	262 mg/dL
Low Density Lipoprotein	225 mg/dL
High Density Lipoprotein	17 mg/dL
T ₃ level	2.93 pg./ml
T ₄ level	0.63 ng/dl
serum creatinine	1.21 mg/dl

Diagnostic Parameters

His diagnostic tests showed thrombocytosis (605000/ μ L), Hemoglobin level was normal (15 g/dL), total cholesterol (262 mg/dL), low density lipoproteins (225 mg/dL), high density lipoproteins (17 mg/dL). Besides this, thyroid test provided free T₃ 2.93 pg./ml, free T₄ 0.63 ng/dl, serum creatinine 1.21 mg/dl. His cardiovascular condition signed at the time of admission to emergency department presented heart rate equal to 90 beats/minute with blood pressure, 120/70 mm of Hg, glycemic level was 6.93 mmol/L. his body mass index was 23 kg/m³. His admission electrocardiogram (ECG) showed ST elevation in I, a VL, and V2-V6 shown as [figure 1](#). This suggested an acute anterolateral wall MI-STEMI which favored urgent coronary angiogram as shown in [figure 2](#). He was shift to Cath Lab and was catheterized after loading dose of Aspirin 75 mg with clopidogrel 300 mg and Rosuvastatin 40 mg.

Coronary angiogram was usefully conducted, which showed all coronaries normal except 90% thrombotic lesion which had caused peripheral occlusion in left anterior descending artery. The occluded vessel was cleared from thrombi through aspiration by Hunter catheter, the resultant thrombi is shown in [figure 2](#). Further improvement in blood flow was brought through balloon angioplasty. Eptifibatide, a

platelet clot preventing agent was injected as 180 mg/kg bolus followed by infusion of 2 mcg/kg/min. electrocardiogram was again conducted which showed that ST-T changes are normalized in anterolateral leads. Additionally, his transthoracic echo cardiogram showed reduced left ventricular ejection fraction by 44%, apex was hypokinetic, pseudo mitral inflow pattern for normal cardiac chambers and values. His dietary pattern was disconnected.

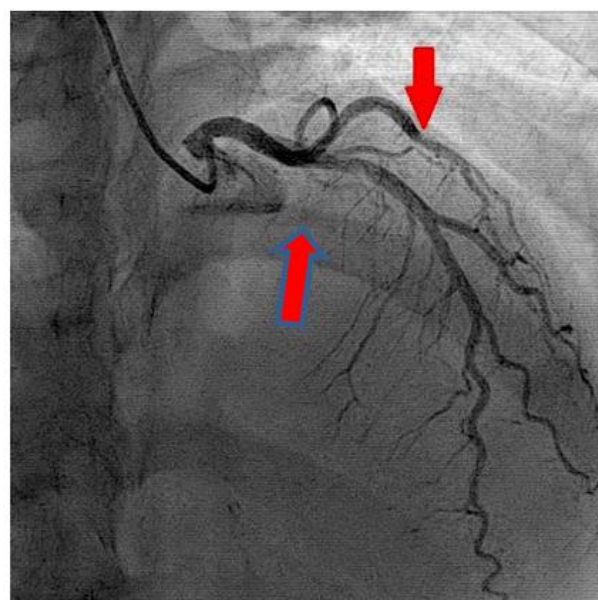


Figure 2. Coronary artery angiogram.

3. Discussion

Acute ST-Elevation myocardial infarction (STEMI) is progressively affecting younger generation albeit coronary artery disease is disease of older age. Predisposing factor in younger generation are aberrant life style and dietary patterns adopted by targeted group. Atherosclerosis as a disease marker is caused by number of factors including sedentary life, consumption of oily foods, smoking and anabolic steroids for body shaping [12-14].

Steroidal compositions are utilized for body shaping and these drugs are overdosed in most cases. Anabolic steroids as a substance of abuse are consumed in doses, higher than normal physiological needs globally by body builders and body shaping enthusiast without much care to detrimental effects on the physiological working of the body. The subsequent supraphysiological dosing leads to hypertension, hypertrophy at the level of left ventricle, arrhythmia and STEMI [15]. Thyroxine is physiologically associated with enhancement of expenditure of energy. Body builders utilize higher thyroxine levels as a leverage to increase cardiac contractility and decreased peripheral resistance so as to achieve goal of better performance during tough and strenuous long hour of exercising and physical activity in gym.

Higher levels of circulating thyroxine was associated with rising risk of severity of infarct and tissue damage in infarction patients [16, 17]. The higher nutritional value of whey proteins and power boosters predisposes users towards thrombus formation in vessels. STEMI associated white thrombus can be cured successfully as it has more fibrin and less ischemic timing [18].

4. Conclusion

Unwarranted anabolic steroids, coupled with malnutrition related to protein, fat burning are emerging causes of STEMI in young adults who are body shaping enthusiasts. The abusive trend of consumption is prevalent within middle class particularly. There is a lack of regulatory policies on the sales and consumption of these supplements as they are at most consumed without proper consultation with dieticians and registered medical prescribers. The lack of proper facilities in hospitals can lead to fatality. So promulgation of proper dosage of diet without consumption of anabolic steroids through media awareness programs is required to prevent earlier life death in body shaping enthusiasts.

Abbreviations

STEMI: Acute ST Elevation Myocardial Infarction

CAD: Coronary Artery Disease

MI: Myocardial Infarction

ISSN: International Society of Sports Nutrition

ECG: Electrocardiogram

T3: Triiodothyronine

T4: Tetraiodothyronine

Author Contributions

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Victory Iyah: Supervision

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Wondimagegn Tibebu Tilahun: Investigation

Conflicts of Interest

The authors declare no conflicts of interest.

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