ISSN: 2593-9947
Journal of Clinical and Medical Sciences

OPEN ACCESS Freely available online

Opinion Article

Hypertension or Blood Pressure Effects in Adolescent Athletes

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DESCRIPTION

Hypertension is also the most common cardiovascular condition affecting athletes. Athletes may have higher blood pressure than non-athletes due to several factors, such as genetics, stress, diet, medication use, and drug abuse. However, the treatment for hypertension in athletes can be different from typical methods, mainly because some drugs may have adverse effects that could affect training and performance. The diagnosis of hypertension in athletes requires accurate measurement of blood pressure using properly fitting cuffs and repeated readings on different days. The definition of hypertension varies depending on age, as age-adjusted measures are necessary for children and adolescent athletes.

Hypertension, or high blood pressure, is a common condition that affects about one in four adults worldwide. It is considered as having a systolic blood pressure (the top number) of 140 mmHg or higher, or a diastolic blood pressure (the bottom number) of 90 mmHg or higher. It can increase the risk of heart disease, stroke, kidney failure, and other health problems.

The stages of hypertension are classified as follows:

Injury Pre-hypertension: blood pressure 120-139/80-89 mmHg
Stage 1 hypertension: blood pressure 140-159/90-99 mmHg
Stage 2 hypertension: blood pressure ≥160/≥100 mmHg

The goal of treatment is to achieve a blood pressure below 140/90 mmHg or 130/80 mmHg if the athlete has other diseases present, such as heart disease, diabetes, or high cholesterol. The treatment strategies include non-pharmacologic interventions and medical therapy.

Non-pharmacologic interventions are the first-line approach for hypertension management in athletes. They include lifestyle modifications such as dietary changes, weight loss, exercise, stress reduction, and avoidance of substances that can increase blood pressure. Some examples are:

Dietary changes: reducing sodium intake, following the DASH diet (rich in fruits, vegetables, and low-fat dairy products), and increasing potassium, calcium, and magnesium intake.
Weight loss: losing as little as 5% of body weight can lower blood pressure significantly.
Exercise: engaging in regular aerobic exercise can reduce blood pressure in about four weeks; however, some sports may have higher cardiovascular demands than others and may need to be modified or avoided depending on the severity of hypertension
Stress reduction: practicing relaxation techniques such as meditation, yoga, or breathing exercises.
Avoidance of substances: limiting alcohol consumption, quitting tobacco use, and avoiding drugs such as cocaine, stimulants, anabolic steroids, non-steroidal anti-inflammatory drugs (NSAIDs), caffeine, and some herbs or supplements.

Medical therapy may be needed for athletes who do not respond to lifestyle modifications or have severe hypertension. However, the choice of medication should take into account the potential side effects on athletic performance and safety. Some medications may cause fatigue, dizziness, dehydration, electrolyte imbalance, or affect heart rate and rhythm. Therefore, the medication should be tailored to the individual athlete's needs and preferences.

Some examples of medications that are generally safe and effective for hypertensive athletes are Angiotensin-converting enzyme (ACE) inhibitor lowers the blood pressure by relaxing blood vessels and reducing fluid retention; they may also protect the heart and kidneys from damage. Angiotensin receptor blockers (ARBs) have similar effects as ACE inhibitors but may cause fewer side effects such as cough or rash. Calcium channel blocker lowers the blood pressure by relaxing blood vessels and slowing down heart rate; they may also prevent chest pain (angina) and irregular heartbeats (arrhythmias). In Diuretics, the lower blood pressure has been increased urine output and reducing fluid retention; they may also prevent swelling (edema) and congestive heart failure

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Received: 02-Jan -2023, Manuscript No. JCMS-23-20269; **Editor assigned:** 05-Jan-2023, Pre QC No. JCMS-23-20269 (PQ); **Reviewed:** 18-Jan-2023, QC No JCMS-23-20269; **Revised:** 24-Jan-2023, Manuscript No. JCMS-23-20269 (R); **Published:** 31-Jan-2023, DOI: 10.35248/2593-9947.23.7.213.

Citation: Doyle C (2023) Hypertension or Blood Pressure Effects in Adolescent Athletes. J Clin Med. 7:213

Some examples of medications that should be avoided or used with caution for hypertensive athletes are:

Beta blockers: they lower blood pressure by slowing down heart rate and reducing cardiac output; they may also cause fatigue, weakness, depression, sexual dysfunction, bronchospasm (in asthmatic athletes), and mask the symptoms of low blood sugar (in diabetic athletes).

Alpha blockers: they lower blood pressure by relaxing blood vessels; they may also cause dizziness.