RESEARCH PAPERS

FIRST INTERNATIONAL CONFERENCE OF

KAAS

VOLUME - III
PHYSICAL & LIVE SCIENCES

Estd.1996

Kanniyakumari Academy of Arts and Sciences
(KAAS)
Nagercoil - 629 001. Tamil Nadu,
South India

KAAS-2008

தம்மின்தம் மக்கள் அறிவுடைமை மாநிலத்து
மன்னுயிர்க்கு எல்லாம் இனிது.

- திருக்குறள் : 8

Nothing is more pleasing to all parents
on this great earth than that their children
should possess real learning

- *The Sacred Kural : 8*

Research Papers : First International Conference of KAAS
Volume - III Physical & Live Sciences

Published by KAAS

First Published : December 2008

Kanniyakumari Academy of Arts and Sciences (KAAS)
60C-2, Daniel Compound, Near Water Tank,
Nagercoil - 629 003.
Tamil Nadu, S. India.
Ph: 91-4652 - 279208

HYPERTENSION AND EXERCISE

BHAVANI AHILAN

Ph.D Scholar, Dept. of Physical. Education and Sports Sciences, Annamalai University.

Hypertension (High blood pressure) is a health risk that the World health Organization (WHO) and International Society of Hypertension (ISH) claims is the biggest challenge facing public health authorities and medical practitioner world wide. Hypertension is almost always without symptoms (WHO, 2002) and is sometimes described as a 'silent killer'. Hypertension is defined as systolic blood pressure (SBP) equal to and greater than 140 and /or diastolic blood pressure (DBP) equal to and greater than 90 mm Hg, risk factors of hypertension can be seen in blood pressure (BP) as low as 115/75 mmHg and will begin to double in risk for every 20/10 mmHg increase (Pescatello,Franklin et al.,2004). The new classification of

"Pre-Hypertensive" (SBP 120-139 and DBP 80-89 mmHg) has been introduced to identify individuals who are at a higher risk of developing hypertension, pointing out an important fact that hypertension is a modifiable risk factor. However, according to experts, hypertension is not predestined. Reducing salt intake, adopting a desirable dietary pattern losing weight and exercising can all help prevent hypertension. Obviously, quitting bad habits and eating a low-fat diet will help, but the most significant thing that you can do is exercise. And just as exercise strengthens and improves limb muscles, it also enhances the health of the heart muscles. Physical activity is one of the most important steps for preventing and controlling hypertension. People who are physically active have a 25-50% lower risk of developing hypertension. Findings from multiple clinical trials indicate that exercise lowers blood pressure as much as some drugs. Regular exercise reduces blood pressure by increasing circulation to the muscles and skin, and widening the arteries. It also improves renal function, which contributes to the body's ability to regulate and eliminate excess fluids. These effects on blood pressure are immediate, after your very first exercise session, and are sometimes measurable even 12 hours later. Of course, the effect of daily exercise on hypertension adds up. If you exercise moderately every day, by the time pressure starts resuming its usual level, you are lowering it again. Within four weeks, regular aerobic exercise can lower your blood pressure readings by as much as 5-15mm Hg.

Introduction

Hypertension is a widespread health problem effecting nearly 25% of the adult population in the United States (Fang et al.2005). Hypertension (High blood pressure) is a health risk that the World health Organization (WHO) and International Society of Hypertension (ISH) claims is the biggest challenge facing public health authorities and medical practitioner world wide. Hypertension is almost always without symptoms (WHO, 2002) and is sometimes described as a 'silent killer'.

Hypertension is defined as systolic blood pressure (SBP) equal to and greater than 140 and /or diastolic blood pressure (DBP) equal to and greater than 90 mm Hg, risk factors of hypertension can be seen in blood pressure (BP) as low as 115/75 mmHg and will begin to double in risk for every 20/10 mmHg increase (Pescatello, Franklin et al., 2004). The new classification of "Pre-Hypertensive" (SBP 120-139 and DBP 80-89 mmHg) has been introduced to identify individuals who are at a higher risk of developing hypertension, pointing out an important fact that hypertension is a modifiable risk factor.

Hypertension is considered primary, or essential, if no obvious cause can be determined. Known risk factors include a hereditary history of hypertension, sex (males at higher risk), high plasma cholesterol, obesity, chronic stresses and cigarette smoking. Secondary hypertension appears as the result of abnormal production outside of

the CVS.For example a condition resulting in excessive production of ADH, rennin, aldosterone or epinephrine will probably produce hypertension.

However, according to experts, hypertension is not predestined. Reducing salt intake, adopting a desirable dietary pattern losing weight and exercising can all help prevent hypertension. Obviously, quitting bad habits and eating a low-fat diet will help, but the most significant thing that you can do is exercise. And just as exercise strengthens and improves limb muscles, it also enhances the health of the heart muscles.

The exercise stimulates the development of new connections between the impaired and the nearly normal blood vessels, so people who exercise had a better blood supply all the muscle tissue of the heart. The human heart basically, supply blood to an area of the heart damaged in a "myocardial infarction." A heart attack is a condition, in which, the myocardium or the heart muscle does not get enough oxygen and other nutrients and so it begins to die. For this reason and after a series of careful considerations, some researchers have observed that exercise can stimulate the development of these life saving detours in the heart.

One study further showed that moderate exercise several times a week is more effective in building up these auxiliary pathways than extremely vigorous exercise done twice as often. Such information has led some people to think of exercise as a panacea for heart disorders, a fail-safe protection against hypertension or death. That is not so. Even marathon runners that have suffered hypertension, and exercise cannot overcome combination of other risk factor.

Statement of the Problem

The purpose of the study was to inculcate knowledge about the hypertension and prevention of the hypertension through exercise.

Causes of hypertension and life style

Sometimes abnormalities of the kidney are responsible. There is also a study wherein the researchers identified more common contributing factors such as heredity, obesity, and lack of physical activity.

Roll of Vitamins/Minerals/Herbs on Hypertension

Nutritional supplements may only be beneficial if dietary intake is inadequate. Consult your Doctor before commencing any supplements, as some may interact with prescribed medications.

- Some studies have shown Coenzyme Q10 to be effective in improving heart function and reducing high blood pressure.
- Fish oil, which contains omega-3 fatty acids, has been shown to reduce blood pressure.
- Vitamin E has been shown in clinical trials to have a protective effect on the heart and a blood pressure lowering effect in cases of mild Hypertension.

Exercises

There are two kinds of exercise; dynamic (or isotonic) and static (isometric). Dynamic exercise is cardiovascular e.g. walking, running and cycling, whereas static exercise consists of muscle strengthening with minimal movement e.g. weight lifting. Dynamic exercise is more effective than static in lowering blood pressure. Walking and running do not cause a sustained increase in blood pressure and perhaps represent the most suitable endurance exercises for a person with hypertension. Mild exercise, such as brisk walking for 30 to 60 minutes a day, is usually enough to induce small declines in blood pressure. Vigorous exercise such as riding a bicycle at 75 percent of maximum heart rate for 40 minutes can lower blood pressure by substantial amounts.

Moderate swimming i.e. 30 to 45 minute sessions, 3 days per week, can lower systolic but not diastolic blood pressure at rest. Swimming may be a suitable alternative exercise for hypertensive people who are obese, have exercise-induced asthma or orthopedic injuries. For a therapeutic benefit, exercise should be performed at least 3 days a week. Exercising for more than 10 weeks appears to reduce blood pressure more than shorter-duration programmes. Exercise should become a part of your regular routine because the positive effect of exercise on Hypertension persists only as long as regular endurance exercise is maintained.

Cardiovascular exercise

1. Cardiovascular exercise should be performed for

30-60 minutes, at least three times a week, at moderate intensity (60%-75% of your target heart training zone as defined by your doctor). You may divide your session into three 10 minute stretches. Cardiovascular physical activity is agreed to be the most beneficial form for exercise for hypertension. Activities using large muscle groups in rhythmical fashion in a very low intensity (i.e. 40-60% of VO2 max) appear to lower the blood pressure effectively. Some activities like walking, jogging, cycling and cross training are among the best types of cardiovascular exercises for hypertension. These cardiovascular exercises can be conducted 3 to 4 times weekly from 20 to 60 minutes duration, but be cautious and keep a gradual progression in the activity, start from 10 minute of activity and gradually add 5 minutes in every two weeks. Also it's advisable to do a proper and extended warm up and cool down in every exercise session.

2. Strength training is also important.– but should be safely designed with fitness professional. Emphasize large muscle groups (thighs, hips, and torso) for greatest effect. Circuit training is known as the best form of resistance training for hypertension.
3. Flexibility training (stretching) forms a large part of any exercise program. Flexibility training should be at least done 2 to 3 time weekly. In general it is advisable to do flexibility training in every exercise session. For best results hold the stretch for 10 to 15 seconds and stretch all major muscle groups concentrating more on any tight muscles in the body.

Contra indication of exercise

When you are hypertensive there are special points to look at when exercising,

- Do not hold breath at any phase of exercise
- If you feel that you are getting exhausted, stop immediately
- When doing all strength exercise avoid doing any overhead movement like shoulder presses or incline bench presses which may increase the blood pressure.
- Avoid performing exercises to failure; maintain a weight which you are comfortable for at least 15 reps.

Conclusions

Exercise training causes a decrease in blood pressure, particularly in those subjects who are hypertensive. The blood pressure at rest as well as during exercise was reduced following six months of exercise training. Before training, the subjects were considered borderline hypertensives, after training, they had normal blood pressure.

1. In epidemiological survey, men in physically active occupations had lower systolic and diastolic blood pressures than did those in sedentary work.
2. Men identified as physically fit by a bicycle ergo meter test had lower systolic and diastolic blood pressures than did those identified as unfit.
3. Decreases in both blood pressures from participation in exercise regimens of the walk-jog type.
4. In hypertensed men lowered their blood pressures following participation in isometric exercise over a period of 5-8 weeks.
5. Improved blood pressure of post coronary patients with elevated blood pressures as a result of aerobic-type training over a period of 3-8 months; mathed control groups did not improve.
6. As might be expected, the effects of exercise on systolic and diastolic blood pressures of hypertensed individuals are greater than for those with blood pressures with in the hormal range.
7. The physiological advantages from lowering blood pressure through exercise in hypertensive populations are sufficient to encourage the inclusion of exercise within most therapeutic programs designed to manage this disease.

Recommendations

- Know your blood pressure - the higher it is, the more frequently it needs to be checked.
- Avoid becoming overweight, or lose weight if your body measurement index (BMI) is greater than 25.
- Perform moderate physical activity 30 to 60 minutes five days a week or more.

- Stop alcohol intake.
- Restrict sodium intake (table salt).
- Increase dietary potassium and calcium intake.
- Move toward a plant-based diet and reduce consumption of animal products (meat, cheese, eggs).
- Develop skills to deal with stressful situations.

REFERENCE:

Boyer, I and Kasch F.,(1970):Exercise therapy in hypertensive men.J.A.M.A.

Choquette, G., and Ferguson, R.J., (1973): Blood pressure reduction in 'borderline'hypertensives following physical training. can.Med.Assoc.J.

Clarke H.H.,(1979. Exercise and some coronary risk factors.phys.Fit.res.Digest.

Fang.J.,Wylie-Rosett,J.,andALderman,M.H(2005).exercise and cardiovascular out comes by hypertensive status: NHANES I epidemiological follow-up study,1971-1992. American Journal of Hypertension.

Kilbom.A.,(1971).Physical training with sub maximal intensities in women.I.Reaction to exercise and orthostasis.sc and. J.clin.Lab.Invest.

Mc Ardle William D, Katch Frank I, Katch Victor L., (1986).Exercise Physiology-energy, Nutrition and Human performance.2nd edition, U.S.A: Lea &Febiger Philadelphia.

Mann,g.,Garrett,H.,Farhi,A.,Murray.H.,and Billings., (1969). Exercise to prevent coronary heart disease,Am.J.Med.

Martini Frederic., (1989).fundamentals of Anatomy and physiology.U.S.A; premtice hall, Englewood cliffs, New Jersey.

Nieman David C., (1998).The Exercise health Connection. United States of America: Human Kinetics.

Pescatello,L.S.,Franklin,B.A.,Fagard, R.,farquhar, W.B.,Kelley, G.A., andRay,C.A.,(2004).American College of Sports Medicine Position stand: Exercise and hypertension. Medicine & Science in Sports & Exercise.