

## REFLECTIONS ON THE DANGERS OF HYPOKINETIC DISEASES: THE ROLE OF EXERCISE TOWARDS PREVENTION, MANAGEMENT AND TREATMENT

*Atufe Ufuoma*

### **Abstract**

This paper looked at reflections on the danger of hypokinetic diseases and the role of exercise towards their prevention, management and treatment. Diseases by their nature are dangerous and cause slow deaths in both suspecting and unsuspecting individuals. Hypokinetic disease is a sedentary illness and can also be acquired through reckless lifestyles and genetic endowment. Exercise are physical activities done for the purpose of getting physically fit and have been confirmed by research findings to be a very useful tool in the prevention, management and treatment of hypokinetic diseases. This paper examined the types and consequences of hypokinetic diseases and also prescribed exercises for them.

Health varies greatly with income, gender, age and family origin, and increasing the span of healthy life is a principal health goal of Western countries (Blair, 2001). The condition under which many people, communities or nations of the world live today is of great concern to many as it affects their health. Most people are apprehensive when confronted with health related issues (Athena, 2000).

Good health is of primary importance to adults in every society, when polled about important social values, 99 percent of adults in the United States identified “being in good health” as one of their major concerns. The two other concerns expressed most often were good family life and good self-image. The 1 percent who did not identify health as an important concern had no opinion on any social issues (Corbin, Welk, Corbin & Welk, 2004).

People sometimes feel immortal because of the harmful effects of unhealthy lifestyles which are often not immediate. As we grow older, we begin to realize that we are not immortal and that unhealthy lifestyles have cumulative negative effects which might be hypokinetic diseases or conditions. Hypo-means “under” or “too little,” and kinetic means “movement” or activity. Hypokinetic means “too little activity”. A hypokinetic disease or condition is one associated with lack of physical activity or too little regular exercise. Examples include heart disease, low back pain, adult-onset diabetes, obesity and chronic diseases (U.S Department of Health and Human Services, 2000).

Starting early in life to emphasize healthy behaviours results in long – term health, wellness, and fitness benefits. Hypokinetic diseases are dangerous health conditions that shortens lives when left unattended to, and research shows that exercise done on regular basis assist to prevent the onset of hypokinetic diseases and also manage and treat them. According to American College of Sports Medicine (2002) exercise done on a regular basis had been recommended according to research findings, as vital way to sustaining, maintaining and improving one’s health status for wellness and longevity purposes (Oboh, Oriabure & Edafeadhe, 2010). Exercise is physical activity done for the purpose of getting physically fit (Armbruster & Godwin, 2001). Exercise is also seen as activity that is performed for the purpose of improving, maintaining or expressing a particular type(s) of physical fitness (Roberg & Keteyian, 2003).

Regular exercise in the form of physical activity and good fitness can promote health, help prevent disease: One recent study has shown that physical fitness measured using a treadmill test is a more powerful predictor of longevity than any other risk factor, including smoking, heart problems, high blood pressure, high cholesterol, and diabetes ([www.cdc.gov/nccdphp/sgr/sgr.htm](http://www.cdc.gov/nccdphp/sgr/sgr.htm)).

In examining the role of exercise towards the preventing, management and treatment of hypokinetic diseases, this paper highlighted the following subheadings: genesis of hypokinetic diseases, types of hypokinetic diseases, and hypokinetic diseases, and finally prescription of exercises for hypokinetic diseases.

### **Genesis of Hypokinetic Disease**

In 1961, Kraus and Raab coined the term hypokinetic disease to describe health problem associated with lack of physical activity. They showed how sedentary living, or as they called it “take it easy” living contributes to the leading killer diseases in our society (Corbin, 2003). Four of the major causes of death are considered to be hypokinetic; heart disease, cancer, stroke, and diabetes. Some experts have differentiated between hypokinetic diseases such as those listed and hypokinetic conditions such as back pain and obesity. Although experts agree that these are hypokinetic conditions, there is no universal agreement that conditions such as these are diseases (American College of Sports Medicine, 2000).

According to Corbin, (2004) studies show that the symptoms of hypokinetic conditions begin in youth. This suggests that the incidence of hypokinetic disease in our culture will not be reduced without considerable lifestyle change in people of all ages.

The genesis of hypokinetic diseases stemmed from three factors; sedentary lifestyle,

genetic endowment and food and drug related abuse.

**1. Sedentary Lifestyle:** This means when an individual is not involved in any physical activity or participate in physical exercises. There is the tendency for fats to sediment through excessive eating gained from fatty foods. Experts use the term sedentary death syndrome (SeDS) to describe a group of symptoms associated with sedentary living. Included are weak skeletal muscles, low bone density, poor metabolic fitness (high blood sugar and fat levels, obesity, and high blood pressure at rest), and low cardiovascular fitness.

**2. Genetic Endowment:** Some people with a family history of disease may conclude they can do nothing because their heredity works against them. Certain families are unfortunately endowed with hereditary diseases which are passed to future generations. The onset of these hypokinetic diseases on future generations may not manifest early in life, and certain factors are expected to trigger them one way or the other (Ainsworth, 2003).

**2. Food and Drug Related Abuse:** Food is meant for human consumption for the purpose of nourishment and to stay alive. However, the manner certain foods are abused might have unpleasant consequences on the body, its organs and functions. Some foods have high fatty cholesterol in them, which might not do every consumer good after prolonged consumption. Prolonged consumption of foods high in fatty cholesterol and sugar might produce hypokinetic diseases like heart problem, diabetes. While excessive

drug abuse may result in cancer and high blood pressure, and some toxic drugs will also cause cancer and other chronic illnesses and diseases (Athena, 2000).

2003, as many as 1,500,000 Americans will have a new or recurrent heart attacks, and about one – third of them will die.

### **Types of Hypokinetic Diseases**

Hypokinetic diseases or condition include heart disease, hypertension, cancer, stroke, diabetes, low back pain and obesity etc.

**1. Heart Disease:** Heart diseases are classified as cardiovascular diseases. The many types of cardiovascular diseases are the leading killers in automated societies and there are many forms of cardiovascular disease (CVD). Some are classified as coronary heart disease (CHD) because they affect the heart muscle and the blood vessels inside the heart. Coronary occlusion (heart attack) is a type of CHD. Angina pectoris (chest arm pain), which occurs when the oxygen supply to the heart muscle is diminished, is sometimes considered to be a type of CHD, though it is really a symptom of poor circulation (Manson, 2002).

Hypertension (high blood pressure), stroke (brain attack), peripheral vascular disease, and congestive heart failure are other forms of CVD. In the United States, CHD accounts for approximately 31 percent of all premature deaths. Stroke accounts for an additional 7 percent, and men are likely to suffer from heart disease than women (American College of Sports Medicine, 2000).

According to 1998 estimates as reported by American Heart Association, Heart and Stroke Statistical Update in (2001) 60,800,00 Americans have one or more forms of cardiovascular disease. In 1998 alone, cardiovascular diseases claimed 949,619 lives or 40.6 of all deaths. In

**2. Hypertension or High Blood Pressure (HBP):** Hypertension, or elevated blood pressure is one of the most prevalent chronic diseases in the United States. Simply defined, hypertension is a chronically elevated blood pressure greater than 140 / 90 mmHg. Specifically, a person with hypertension is defined as having a systolic and / or diastolic blood pressure reaching greater than 140 / 90mmHg on two or more separate occasions, or currently taking antihypertensive medications (Hagberg, 1991).

Hypertension is related to the development of CHD, atherosclerosis, stroke, congestive heart failure, left ventricular hypertrophy, aortic aneurysms, peripheral arterial diseases, and kidney failure. The majority of individuals with high blood pressure are not on any therapy to control their blood pressure, and do not even know they have a problem. The cause of 90% to 95% of the cases of HPB are not known, but once detected, can be controlled.

Many of the risk factors for hypertension, such as obesity, excessive alcohol intake, and physical inactivity, can be controlled. Hypertension is a serious medical problem if left untreated, and individuals with it have three to four times the risk of developing coronary artery disease, and up to seven times the risk of having a stroke (Hagberg, 1991).

The detrimental effects of hypertension are on the heart, brain and kidneys. The heart must work harder (by generating more pressure) to pump blood around the body. This increases the heart's demand for oxygen and, if atherosclerosis is present, may cause insufficient blood flow (ischemia) or induce angina or a

myocardial infraction (Robergs & Keteyian, 2003). Exceptionally low blood pressures (below 100 systolic and 60 diastolic do not pose the same risks to health as high blood pressure but, can cause dizziness, fainting, and lack of tolerance to change in body positions.

**Table 1: Classification of Blood Pressure for Adults**

Category	Systolic Blood Pressure	Diastolic Blood
Pressure	(mmHg)	(mmHg)
Goal	<120	<80
Normal	<130	<85
High normal	130 – 139	85 – 89
Stage 1 hypertension	140 – 159	90 – 99
Stage 2 hypertension	160 – 179	100 - 109
Stage 3 hypertension	≥ 180	≥110

Source: National Institute of Health in Corbin, (2004)

**3. Cancer:** Cancer is referred to any malignant new growth or tumour in the body. It can also be seen as a carcinoma or disorderly growth of epithelial cells which invade an adjacent tissue and spread by the lymphatic and blood vessels to other parts of the body (Kirkpatrick, 1983). Of the various cancers (Colon, breast, lung, prostate, etc), the most studied and the one with the clearest inverse relationship between exercise and incidence of disease is colon cancer (Lee, 1995 & Wells, 1996). Generally, comparing both occupational and leisure time activities, sedentary males and females are at nearly 1<sup>1/2</sup> – 2 – fold increased risk for colon cancer when compared to their active counterparts.

**4. Stroke (Cerebrovascular Disease):** Stroke is a condition in which the brain, or part of the brain, receives insufficient oxygen as a result of diminished blood supply; sometimes called apoplexy or cerebrovascular accident (CVA) (Waugh

& Grant, 2001). An increase of damage to the inner surface of blood vessels may cause stroke, when the blood supply to the brain drastically reduces. When the part of the body that is supposed to be controlled by the brain did not receive impulses as a result of insufficient oxygen to the brain, it will not move or function as required. Stroke can be partial or complete stroke. Partial stroke may be temporal, while complete stroke involves no movement but comatose position. The onset of stroke may be immediate with consistent body signs (U.S. Department of Health and Human Services, 1996).

According to Waugh and Grant (2001), the condition of stroke is a common cause of death and disability, especially in the elderly. The predisposing factors include:

- hypertension
- atheroma
- cigarette smoking
- diabetes mellitus

Stroke occurs when a vascular disease suddenly interrupts flow of blood to the brain causing hypoxia. The effects include paralysis of a limb on one side of the body and disturbances of speech and vision. The nature and extent of cerebral impairment depends on the size and location of the affected blood vessels. The main causes are cerebral infraction (approximate 85%) and spontaneous intracranial haemorrhage (15%) (Waugh & Grant, 2001).

**5. Diabetes Mellitus (Diabetes)** is a group of disorders that result when there is too much sugar in the blood. It occurs when the body does not make enough insulin or when the body is not able to use insulin effectively. Diabetes is the seventh leading cause of death among people over forty. It accounts for at least 10 percent of all short-costs in Western

society (Corbin et al, 2003). According to the American Diabetes Association (ADA), there are 17 million people in the United States who have diabetes, as at 2002. Unfortunately, 5.9 million of those don't know it.

There are two types of diabetes, type 1 and type 2. Type 1 diabetes, or insulin – dependent diabetes, accounts for a relatively small number of the diabetes cases and is not considered to be a hypokinetic condition. Type II diabetes (often non insulin – dependent) was formerly called “adult onset diabetes”. In recent years, Type II diabetes has become common in children and is associated with high levels of body fat ([www.healthcanada.ca](http://www.healthcanada.ca)).

Type II diabetes is the most common form of diabetes, accounting for about 90% of cases. Most patients are obese and it tends to develop in women over 75 years and men over 65 years and the cause is unknown. Insulin secretion may be below or above normal. Deficiency of glucose inside body cells may occur when there is hyperglycaemia and a high insulin level. This may be due to changes in cell membrane which block the insulin – assisted movement of glucose into cells (insulin resistance) (Waugh & Grant, 2001).

- Effects of Diabetes Mellitus

- raised blood glucose level
- weight loss
- ketoacidosis
- diabetes coma
- hyperglycaemic coma
- cardiovascular disturbances
- infection
- renal failure

**6. Obesity:** This is a very common nutritional disorder in which there is accumulation of excess body fat. Clinically, obesity is present when body weight is 120% of that recommended for the height, age and sex of the individual. It occurs when energy intake

exceeds energy expenditure, e.g. in inactive individuals eating more calories than they need for energy requirements (Waugh & Grant, 2001).

- gallstones
- cardiovascular diseases, e.g. ischaemic heart disease
- hernias
- varicose veins
- osteoarthritis
- type II (non – insulin – dependent) diabetes
- increased incidence of postoperative complications.

### **Consequences of Hypokinetic Diseases**

Virtually all chronic diseases that plague society are considered to be hypokinetic, though some relate more to inactivity than others. Nearly three quarters of all deaths among those eighteen and older are a result of chronic diseases (Medicine and Science in Sports and Exercise, 2001).

Other consequences of Hypokinetic Diseases are as follows:

- heart failure
- stroke
- dizziness
- fainting
- kidney infection
- atherosclerosis
- osteoporosis
- insulin sensitivity
- renal failure
- poor blood circulation
- premature death

### **Exercise and Hypokinetic Diseases**

Approximate rate of death from leading causes shows that heart diseases are at the top. Exercise plays an important role in preventing heart disease, as well as in the rehabilitation of individuals with heart disease (Dawber, Meadors & Moore, 1991).

### **The Role of Exercise in the Prevention, Management and Treatment of Hypokinetic Diseases**

- Exercise reduces the risk of hypokinetic diseases by preventing or delaying the onset of manifestation of the signs and symptoms in individuals.
- regular exercise improves the physical fitness of individuals thereby improving the body immunity to hypokinetic diseases.
- exercise helps to increase energy expenditure, especially for individuals who expended relatively moderate levels of energy (>1,000 Kcal /wk).
- research shows that exercise also helps avoid illnesses such as obesity, stroke, specific (but not all) cancers, non-insulin – dependent diabetes, osteoporosis, and obstructive pulmonary diseases (U.S. Department of Health and Human Services, 1996).
- exercise reduces the risk of dying prematurely
- exercise reduces the risk of developing high blood pressure
- exercise reduces the depression and anxiety
- exercise control weight
- exercise build and maintain healthy bones, muscles, and joints
- exercise helps older adults become stronger and better able to move without falling
- exercise promotes psychological well-being
- exercise helps in the management and treatment of individuals whose movement patterns are disturbed by stroke or any other hypokinetic diseases during rehabilitation and therapeutic stages.

Exercises can be referred to as physical activities and there are different types prescribed for various hypokinetic diseases.

### **Exercise Guidelines and Recommendations for Heart Diseases and Cancer (Hypertension, Stroke etc)**

- avoid holding breath and straining during exercise (Valsalva maneuver)
- low weight resistance training should be used as a supplement to endurance training, not as the primary exercise.
- some intensities may need to be monitored by the RDE (rating of perceived exertion) scale because some blood pressure modification can alter the accuracy of training health rates during exercise.
- Individuals with hypertension should be instructed to move slowly when transitioning from the floor to standing because they are more susceptible to orthostatic hypotension, especially if they are taking an antihypertensive medication.
- both hypertensive and hypotensive responses are possible during and after exercise for individuals with hypertension.
- individuals with severe hypertension need to be carefully monitored when starting an exercise programme, and possibly long term.

**Exercise mode:** Endurance activities, such as walking, running, cycling, swimming, and so on.

**Exercise Intensity:** 50% to 60% Vozmax gradually increasing to 65% to 70% Vozmax.

**Exercise Frequency:** 4 to 5 days / week.

**Exercise Duration:** 30 min or more (American College of Sports Medicine, 2000).

**Exercise Guidelines for Individuals with Diabetes**

American Diabetes Association (2000) prescribed the following as guidelines for individuals with diabetes:

Individuals with diabetes mellitus should participate in regular physical activity and preferably perform exercise training as follows:

- do not inject insulin into the muscle groups to be exercised
- check blood glucose regularly
- always carry a rapid – acting (simple carbohydrates) food to correct hypoglycemia

**Prescription of Exercises for Individuals with Hypokinetic Diseases**

<b>General Exercise Recommendations for Type 1 Diabetes</b>	<b>General Exercise Recommendations for Type 2 Diabetes</b>
<b>Component Recommendation</b>	<b>Component Recommendation</b>
Type: Aerobic walking, cycling, stair- climbing, cross-country skiing. Strength training: circuit programmes using light weight with 10 – 15 repetitions.	Type: Aerobic: walking, jogging, cycling, stair climbing, cross- country skiing etc. Strength (moderate level resistance training): circuit programme using light weights with 10 – 15 repetitions.
Intensity:50 – 85% heart rate reserve or 50 – 85% Vozmax	Intensity: 50 – 85% heart rate reserve or 50 – 85% Vozmax
Duration: 20 – 60 min plus 5 – 10min warm – up and cool-down period	Duration: 20 – 60min plus 5 – 10min warm – up and cool – down period.
Frequency: Daily to ensure optimal blood glucose control.	Frequency: 3 – 5 times per week daily if on insulin therapy.

**Summary and Conclusion**

The scourge of hypokinetic diseases to mankind, especially to adults and the aged is not to be taken lightly, because more deaths will still occur as a result of unawareness and negligence. Individuals from the developing world are highly susceptible to hypokinetic diseases and hence more casualty and deaths. According to lots of research findings, exercise has assisted in the prevention, management and treatment of hypokinetic diseases, which this paper had equally thrown more light on. It is therefore, expected that if the prescribed exercises are seriously participated in, casualty and deaths from hypokinetic diseases will be greatly reduced.

**Recommendations**

The following recommendations were made for the study:

1. Regular medical check-up should be done by adults above thirty – five years of age.
2. Individuals with parents who died of hypokinetic diseases should avoid the same lifestyle their parents lived.
3. Regular exercise should be done in form of physical activities on daily basis.
4. Care should be taken by individuals with hypokinetic diseases not to over do prescribed exercises.
5. The age of individuals with hypokinetic diseases should be taken into consideration with regards to intensity of exercises.
6. Exercises should start from very light to moderate work-load for the aged.

**References**

- Ainsworth, B.E. (2003). The compendium of physical activities. *President's Council on Physical Fitness and Sport Research Digest* 4(2), 1 – 8
- American College of Sports Medicine (2002). Progression models in resistance training for healthy adults (position stand). *Medicine and Science in Sports and Exercise* 34(2), 364- 380.
- American College of Sports Medicine (2000). *ACSM's guidelines for exercise testing and prescription* (6<sup>th</sup> ed.) Philadelphia: Lippincott, Williams and Wilkins.
- American Diabetes Association (2000). Diabetes mellitus and exercise. *Diabetes Care* 23, (Suppl.) 1: 850 – 854.
- Armbruster, B. & Gladwin, L. A. (2001). More than fitness for older adults: A whole-istic approach to wellness. *ACSM's Health and Fitness Journal*. 5(2), 6 – 10.
- Athena, D. (2000). Communication about health current issues and perspective. California: Mayfield Public Company.
- Blair, S.N. (2001) *Active living everyday*. Champaign, IL: Human Kinetics.
- Corbin, B. C., Welk, G.J., Corbin, W.R. & Welk, K. A. (2004). *Concept of physical fitness: active lifestyles for wellness*. (12 ed.) Boston: Mc Graw Hill.
- Dawber, T.R. Meadors, G.F., & Moore, F.E. (1991). Epidemiological approaches to heart disease: The Framingham Study A.J. *Public Health* 41, 279 – 286.
- Hagberg, J.M. (1991). Exercise, fitness and hypertension. In Bouchard, C. Shephard, R. J. Stephens, T, & McPherson (ed.) *Exercise, fitness and health: A consensus of current knowledge*. Champaign. IL: Human Kinetics.
- Lee, I.M. (1995). Physical activity and cancer. *Physical activity and fitness research digest*. 2, 1 – 8.
- Manson, J.E. (2002). Walking compared with vigorous exercise for the prevention of cardiovascular event in women. *New England Journal of Medicine*. 347(10), 716-725.
- Oboh, P. O., Oriabure, A. & Edafeadhe, B. (2010). *The effect of exercise on women and fetus during pregnancy*. A conference paper presented at Mojese second national annual conference.
- Robergs, R. A. & Keteyian, S. J. (2003). *Fundamentals of exercise physiology for fitness, performance ,and health* (2<sup>nd</sup> ed.) Boston: Mcgraw – Hill.
- U.S. Department of Health and Human Services (2000). Healthy people 2010 (2<sup>nd</sup> ed.) *With understanding and improving health and objectives for improving health*. 2 Vols. Washington, D.C: U.S. Government Printing office.
- U.S. Department of Health and Human Services (1996). *Physical activity and health: A report of the surgeon general*. Atlanta: U.S. Department of Health Human Services.
- Waugh, A. & Grant, A. (2001). *Ross and Wilson anatomy and physiology in health and*



***Reflections on the Dangers of Hypokinetic Diseases: the Role of Exercise Towards Prevention, Management and Treatment***

---

*illness*. (9<sup>th</sup> ed.) London: Churchill Livingstone.

Wells, C.L. (1996). Physical activity and women's health. *Physical Activity and Fitness Research Digest*. 2, 1 – 6  
[www.healthcanada.ca](http://www.healthcanada.ca)

***Atufe Ufuoma***  
***Department of Sports and Health Education***  
***Delta State College of Physical Education,***  
***Mosogar.***