

DANGER OF HYPOKINETIC DISEASES THE SILENT KILLER: THE SIGNIFICANT ROLE OF EXERCISE TOWARDS PREVENTION, MANAGEMENT AND TREATMENT

Oseremen Peter Oboh, (Ph.D)
Department of Physical and Health Education,
College of Education, Agbor,
Delta State,
Nigeria.

And

Tayire Favour and Okagbare, (Ph.D)
Department of Physical and Health Education,
Delta State College of Physical Education,
Mosogar,
Nigeria.

Abstract

This paper examined the dangers of hypokinetic diseases and the significance role of exercise towards the prevention, management and treatment. Hypokinetic disease is one associated with the lack of physical activity or too little regular exercise and they include heart diseases, diabetes, obesity, low back pain, cancer and other chronic diseases. Exercise was discovered to be important tool for the prevention, management and treatment of hypokinetic diseases, and found a lot cheaper in cost than the use of drugs. This paper looked at the aetiology of hypokinetic diseases, regarding the cause of such ailments and also the types of hypokinetic diseases. The effects of hypokinetic disease are deadly which results in untimely deaths. The paper also looked at the importance of exercise to hypokinetic diseases, and exercise guidelines as well as recommendations.

Mankind had been plagued by one illness or disease since the beginning of recorded history. As civilization crept in, as a result of advancement in education and medicine, the aetiology of illness and diseases became known and hence drastic reduction in casualty rate and deaths.

In recent time, diseases were classified according to their nature and aetiology. There are some diseases that came as a result of pathogenic agents i.e. virus, bacteria, etc, which invades the cells and body tissues. According to Waugh and Grant (2001), disease is usually caused by one or more of a limited number of factors including, genetic abnormalities, either inherited or acquired, infections by microbes or parasites, e.g. viruses, bacteria, or worms, chemicals, ionising radiation, physical trauma and degeneration, e.g. excessive use of ageing.

Four of the major causes of death are considered to be hypokinetic, and they are heart disease, cancer, stroke and diabetes. Hypokinetic means "too little activity" and a hypokinetic disease is one associated with lack of physical activity or too little regular exercise (U.S. Department of Health and Human Services, 2000). According to American College of Sports Medicine (2002), hypokinetic disease may come as a result of sedentary lifestyle and they include, heart pain, adult-onset diabetes, obesity and chronic diseases.

Drugs can be used in the prevention, management and treatment of hypokinetic diseases, but exercise done on a regular basis can equally be used in the prevention, management and treatment of hypokinetic diseases without much cost when compared to huge sums of money spent on expensive drugs, and tests. Exercise done on a regular basis according to research reports had helped to prevent, manage and treat hypokinetic diseases. Exercise is physical activity done for the purpose of acquiring physically fitness (Armbruster & Gladwin, 2001).

The immune system of individuals with hypokinetic diseases otherwise reduced or severely damaged by infections can be slowly revived by logically prescribed exercise in form of different physical activities at dose response (Winett, 1995).

To further examine the essence of this paper, the following subheadings will be highlighted: aetiology of hypokinetic diseases, types of hypokinetic diseases, effects of hypokinetic diseases, exercise guidelines and recommendations for hypokinetic individuals, summary and conclusion as well as recommendations.

Aetiology of Hypokinetic Diseases

Hypokinetic diseases are quite dangerous to man and when treated on time will reduce high casualty rate. Corbin, Welk, Corbin and Welk (2004) reported that studies had shown that symptoms of hypokinetic conditions begin in youth. This therefore suggests that the incidence of hypokinetic conditions begin in youth. This therefore suggests that the incidence of hypokinetic diseases in our culture will not be reduced without considerable lifestyle change. The following factors are the cause of hypokinetic diseases:

1. **Sedentary Lifestyle:** When an individual is not involved in any physical activity or participate in physical exercises to improve physical fitness, there is the tendency for fats to sediment through excessive eating gained from fatty foods (Olivarida 2000).
2. **Genetic Abnormalities (Inherited or Acquired):** This may occur when certain diseases are passed on from one generation to another, from parent to children and so forth. The acquired ones are those caused by environmental factors such as exposure to ionizing radiation and unhealthy lifestyle etc (Waugh & Grant, 2001).
3. **Degeneration:** This may result from excessive use of body parts or organs or from ageing. This also arises prematurely when structures deteriorate causing impaired function (Waugh and Grant, 2001).

Drug and food related abuse individuals who abuse drug may force themselves into contacting hypokinetic diseases like, cancer, kidney problems and hypertension, and other heart related diseases. The consumption of foods that contains fatty acid that is quite high in cholesterol may lead to obesity and stroke and other chronic diseases (Athena, 2000).

Types of Hypokinetic Diseases

Examples of hypokinetic diseases include heart disease, low back pain, adult onset diabetes cancer and chronic diseases.

1. **Heart Diseases:** Heart diseases include cardiovascular diseases (CVD) and they are the leading killers in civilized societies. Cardiovascular diseases 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 and another type of CHD is Angina pectoris (chest or arm pain), which occurs when the oxygen supply to the heart muscle is diminished, which signifies poor circulation (Manson, 2002). Other forms of CVD are hypertension (high blood pressure), stroke (brain attack), peripheral vascular disease, and congestive heart failure. CHD accounts for approximately 31 percent of all premature deaths in United State (American College of Sports Medicine, 2000).

- **Hypertension:** The term hypertension is used to describe blood pressure that is sustained at a higher than the generally accepted normal maximum level for a particular age group e.g.:
 - at 20 years 140/90 mmHg
 - at 50 years 160/95 mmHg
 - at 75 years 170 / 105mmHg

According to Waugh and Grant (2001), arteriosclerosis, associated with ageing, contributes to increasing blood pressure with age but is not the only factor involved. Hypertension is described as essential (primary, idiopathic) or secondary to other diseases. Irrespective of the cause, hypertension commonly affects the kidneys.

There are two types of hypertension, essential and secondary hypertension:

- I. **Essential Hypertension:** This means hypertension of unknown cause. It accounts for 85 to 90% of all cases and is subdivided according to the rate at which the disease progresses. Essential hypertension is further divided into benign (chronic) hypertension and malignant (accelerated) hypertension.
 - **Benign (Chronic) Hypertension:** The rise in blood pressure is usually slight to moderate and continues to rise slowly over many years. Sometimes complications are the first indication of hypertension, e.g. heart failure, cerebrovascular accident, myocardial infarction.
 - **Malignant (Accelerated) Hypertension:** The blood pressure is already elevated and continues to rise rapidly over a few months. Diastolic pressure in excess of 120 mmHg is common. The effects are serious and quickly become apparent e.g. haemorrhages into the retina, papilloedema (oedema around the optic disc), encephalopathy (cerebral oedema) and progressive renal disease, leading to cardiac failure (Waugh & Grant, 2001).
- II. **Secondary Hypertension:** Hypertension resulting from other disease accounts for 10 to 15% of a cases i.e., causes from kidney diseases, endocrine disorders, stricture of the aorta etc.

Table 1: Classification of Blood Pressure for Adults

Category	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Goal	<120	<90
Normal	<130	<85
High normal	130-139	85-89
Stage 1 hypertension	140 -199	90 – 99
Stage 2 hypertension	160- 179	100-109
Stage 3 hypertension	≥189	≥110

Source: National Institute of Health in Corbin et al (2004).

2. **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, i.e. cerebrovascular accident (CVA) Waugh & Grant, 2001). Stroke occurs when a vascular disease suddenly interrupts flow of blood to the brain causing hypoxia. The effects include paralysis of a limb or 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 infarction (approximate 85%) and spontaneous intracranial haemorrhage (15%).

3. **Diabetes Mellitus:** Diabetes mellitus is a condition characterized by a reduced ability to regulate blood glucose concentrations by means of insulin. Diabetes is a disease that results in the diminished capacity of the pancreas to secrete insulin in response to a given glucose stimulus, and/or the use of glucose uptake (Robergs & Keteyian, 2003). The net result of either condition is the same; that of an increased blood glucose concentration, a decreased ability to use glucose as a fuel and subsequent, alterations in the metabolism of carbohydrate, fat and protein. The highly elevated blood glucose causes diabetes to be at increased risk for kidney failure, nerve damage, and eye problems leading to blindness (Robergs & Keteyian, 2003). There are two primary types of diabetes: type 1 and type 2. Type 1 generally occurs in childhood and involves the loss of the insulin - secreting B cells of the pancreas. Consequently, type 1 requires regular injections of insulin along with a controlled diet to regulate blood glucose. Type 2 is the most common form, affecting 90% of the diabetes population. Type 2 predominantly (75%) occurs in over fat adults, and involves the reduced insulin stimulated ability of cells to take up glucose from the blood.

4. **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 adjacent tissue and spread by the lymphatic and blood

vessels to other parts of the body (Kirkpatrick,1983). The colon cancer according to research studies has the clearest inverse relationship with exercise (Lee, 1995). According to Lee (1995), sedentary males and females are at nearly 1 1/2 - 2 fold increase risk for colon cancer when compared to their active counterparts.

5. **Obesity:** Obesity is a state of excess adipose tissue or fats or BMI > 30.0 (Ward & Bar-Or, 1986). According to Waugh and Grant (2001) diabetes 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.

Effects of Hypokinetic Diseases

Hypokinetic diseases: are the leading causes of death especially for individuals from eighteen years and above (Medicine and Science in Sport and Exercise, 2001). Other effects of hypokinetic diseases includes heart failure, stroke, dizziness, fainting, kidney and liver infection; and atherosclerosis. Others are osteoporosis, insulin sensitivity, renal failure and poor blood circulation etc.

The immune-reflections of hypokinetic diseases show how the immune system reacts to hypokinetic diseases. Hypokinetic diseases by their nature are more of chronic diseases which are diseases or illnesses associated with lifestyle or environmental factors, as opposed to infectious diseases. The immune system is constantly kept working very hard to combat the stress placed on it by hypokinetic diseases.

However, exercise aids the immune system by:

- creating an environment that is hostile to invading pathogens such as the increase in core temperature that accompanies exercise;
- developing a more favourable balance between the immune system, the body's response to stress, and the release of neurohormones/endocrines (e.g. cortisol, epinephrine);
- exercise - induced reductions of body fat; and
- favourable alterations in the components of the immune system itself (Mackinnon, 1994).

Importance of Exercise to Hypokinetic Diseases

Exercise assist in the prevention, management and treatment of hypokinetic diseases in the following ways:

- reduces the risk of hypokinetic diseases by preventing or delaying the onset of manifestation of the signs and symptoms in individuals;

- improves the physical fitness components of individuals thereby improving on the body's immunity system to combat hypokinetic diseases;
- increase energy expenditure for individuals who expended relatively moderate level of energy (>1,000 Kcal/wk);
- reduces the risk of high-blood pressure, and weight control;
- used in the management and treatment of stroke and diabetic patients (Corbin et al, 2004). During the past three decades, the evidence of how exercise can prevent and treat disease has accumulated to such a degree that now most medical organisations have published statements on the importance of exercise.
- Exercise over a lifetime may overcome the effects of inherited risk, and it also assist to;
- Increase the ability of the heart muscle to pump blood well as oxygen;
- Prevent atherosclerosis by lowering blood lipid levels (www.mhhe.com/phys);
- Reduces the risk for heart attack, the most prevalent and serious of all cardiovascular diseases;
- Improves coronary circulation, thus, reduce the chances of heart attack or dying from one;
- Serves as effective means of rehabilitation for a person who has coronary heart diseases;
- Reduces the risk of some forms of cancer;
- Play great importance in maintaining bone density and decreasing risk for osteoporosis (www.mhhe.com/phys).

Exercise Guidelines and Recommendations for Hypokinetic Heart Diseases (hypertension and Stroke)

The following are the guidelines for heart diseases as recommended by the America College of Sports Medicine (2000);

- avoid holding breath and straining during exercise (Valsalva Maneuver);
- low weight resistance training should be used as a supplement to endurance;
- some intensity may need to be monitored by the RPE (rating of perceived exertion) scale because some blood pressure modification can alter the accuracy of training heart rates during exercise;
- individuals with hypertension should be instructed to move slowly because when transitioning from the floor to standing they are more susceptible to orthostatic hypertension, especially if they are taking an antihypertensive medication;
- individuals with severe hypertension need to be carefully monitored when starting an exercise programme, on possible 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 During: 30min or more

Exercise Guidelines for Diabetic Individuals

The American Diabetes Association (2000) prescribed guidelines for diabetic individuals, and that they should participate in regular physical activity and preferably perform exercise training in the following advisory pattern:

- do not inject insulin into the muscle group to be exercised;
- check blood glucose regularly;
- always carry a rapid – acting (simple carbohydrate) food to correct hypoglycemia;
- consume carbohydrates snacks as needed during exercise.

General Exercise Recommendations for Type 1 Diabetes	General Exercise Recommendations for Type 2 Diabetes
<p>Component Recommendation Type: Aerobic walking, cycling, stair climbing, cross-country skiing, strength training, circuit programmes using light weights with 10 – 15 repetitions.</p> <p>Intensity: 50-85% heart rate reserve or 54-85% Vo2max</p> <p>Duration: 20-60min plus 5-10min warm-up and cool-down period.</p> <p>Frequency: Daily to ensure optimal blood glucose control.</p>	<p>Component Recommendation 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.</p> <p>Intensity: 50-85% heart rate reserve or 50-85% Vo2max</p> <p>Duration: 20-60min plus 5-10min warm-up and cool-down period.</p> <p>Frequency: 3-5 times per week daily if on insulin therapy.</p>

Summary and Conclusion

Hypokinetic diseases are very dangerous diseases and conditions to man, and they mostly result owing to sedentary lifestyles many individuals lived. Due to their effectiveness in the reduction of lies, concerted efforts had been taken to prevent, manage and treat the diseases among individuals who possess them. Apart from the use of drugs which are quite expensive, exercise readily come handy with less relative cost, and with far-reaching effect in terms of preventing, managing and treating of hypokinetic disease. In this paper, the aetiology, types and effects of hypokinetic diseases were highlighted and also the importance of exercise and prescription of exercise guidelines were looked into. Exercise had been seen as a useful tool in the

prevention, managing and treating patients with hypokinetic diseases and this paper had done its best to highlight this assertion through meaningful explanations.

Recommendations

This paper proffered the following recommendations:

1. Individuals above eighteen years with reoccurring and persistent chronic illness/diseases should undergo regular medical check-up.
2. Care should be taken not to overdo prescribed exercises.
3. The advice of an exercise physiologist should be sought in getting adequate dose of exercise.
4. The age of individuals with hypokinetic diseases should be taken into consideration before prescribing exercises.
5. The severity of the disease should determine the mode, intensity, frequency and duration of exercise during training.
6. Exercises should be done on regular basis as prescribed on continuum.

References

- 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* (6th ed.) Philadelphia: Lippincott, Williams and Wilkins.
- American Diabetes Association (2001). Diabetes Mellitus and Exercise: *Diabetes Care* 23, (Suppl) 1:850-854.
- Armbruster, B. & Gladwin, L.A. (2001). More than Fitness for Older Adults: A Wholeistic 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.
- Corbin, B.C., Welk, G.J. Corbin, W.R. & Welk, K.A. (2004). *Concept of Physical Fitness: Active Lifestyles for Wellness*. (12 ed.). Bostom: McGraw Hill.
- Kirkpatrick, K.I. (1983). *Exercise and Diseases: What is the Connection?* London: Kingsway Publications.

- Lee, I.M. (1995). Physical Activity and Cancer. *Physical Activity and Fitness Research Digest*. 2:1-8.
- Mackinnon, L.T. (1994). Current Challenges and Future Expectations in Exercise Immunology: Back to the Future. *Med. Sci. Sports Exerc.* 26:191-194.
- Manson, J.E. (2003). Walking Compared with Vigorous Exercise for the Prevention of Cardiovascular Event in Women. *New in Women*, *New England Journal of Medicine*, 347(10): 716-725.
- Medicine and Science in Sports and Exercise (2001). Dose - Response Issues Concerning Physical Activity and Health: An Evidence – Based Symposium. *Medicine and Science in Sports and Exercise* 33 (6).
- Oliveridia, R. (2000). Muscle Dysmorphia in Male Weight Lifters. *American Journal of Psychiatry*, 157: 1291-1296.
- Robergs, R.A. & Keteyian, S.J. (2003). *Fundamental of Exercise Physiology for Fitness, Performance and Health* (2nd ed.) Boston: McGraw Hill.
- U.S. Department of Health and Human Services (2000). *Healthy People 2010*, (2nd ed.) with Understanding and Improving Health and Objectives for Improving Health. 2 Vols. Washington, D.C. U.S. Government Printing Office.
- Waugh, A. & Grant, A. (2001). *Ross and Wilson Anatomy and Physiology in Health and Illness* (9th ed.) London: Churchill Livingstone.
- Winnet, R.A. (1995). Physical Activity and Public Health – Letter to the Editor. *JAMA* 274:534-535.

www.mhe.com/phs