Disease Transition in Sub-Saharan Africa: The Case of Non-Communicable Diseases in Nigeria

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DISEASE TRANSITION IN SUB-SAHARAN AFRICA: THE CASE OF NON-COMMUNICABLE DISEASES IN NIGERIA

- The Vice-Chancellor
- Principal Officers of the University
- Fellow Academics
- My Lords Spiritual and Temporal
- Distinguished Ladies and Gentlemen
- Lions and Lionesses

PREAMBLE

I thank the Almighty God, in whom we live and move and have our being, for making this memorable day possible. It is amazing and it is real. I thank God for making me the first female Professor of Medicine to deliver an inaugural lecture in the University of Nigeria. By His special grace and favour, I am also the first person to give such a lecture from the Department of Community Medicine, College of Medicine, University of Nigeria Enugu Campus. Since I was promoted a Professor of Community Medicine of the University of Nigeria some six years ago, I had always looked forward for today; the day to share my thoughts with the university community that has nurtured me for the past thirty-two years and the public in general.

I feel highly honoured to be given the privilege and opportunity to deliver my inaugural lecture.

Community medicine, which has been variously called public health, preventive medicine, social medicine, community health, public health medicine, is a special branch of medicine that deals with the community as an entity, unlike in clinical medicine where the emphasis is on the individual patient. Community medicine is unique in that it incorporates all other branches of medicine and merges them into one practice area that is concerned with the science and art of preventing disease, prolonging life and promoting physical health and efficiency. A public lecture like this, with the bias of my discipline, should therefore not be highly academic, boringly long and directed at only the highly intellectual minds of academics in medicine and allied fields, but should be brought low enough so that the general assembly will benefit. Health undeniably is of great interest to all and sundry.

INTRODUCTION

Non-communicable diseases or NCDs are diseases which are not contagious. In other words, they cannot be transmitted from one person to another. They are chronic conditions that do not result from an acute infectious process. These conditions cause death, dysfunction, or impairment in the quality of life, and they usually develop over relatively long periods – at first without causing symptoms; but after disease manifestations develop, there may be a protracted period of impaired health. Generally, these conditions or diseases result from prolonged exposure to causative agents, many associated with personal behaviours and environmental factors. Risk factors such as a person's lifestyle, genetics, or environment are known to increase the likelihood of certain non-communicable diseases. Of these three risk factors, 50% of all non-communicable diseases are a result of poor lifestyle choices such as drug use, alcohol and tobacco use, diet, lack of exercise or stress management.

Globally, non-communicable diseases are increasingly recognized as a major cause of morbidity and mortality. The World Health Report 2001 had indicated that NCDs account for almost 60% of deaths and 46% of the global burden of disease. Based on current trends, by 2020, these diseases are expected to account for 73% of deaths

and 60% of the disease burden. Seventy-five per cent of the total deaths due to NCDs occur in developing countries. Unfortunately, NCDs have not been considered important enough to be included among the health-related targets of the Millennium Development Goals (MDGs), leading some to question the relevance of these goals for the countries in epidemiological transition. The resources earmarked for them are extremely low despite the obvious trends and few countries have implemented comprehensive policies for preventing and controlling NCDs.

The countries of the Sub-Saharan Africa are thus facing a double burden, with a heavy load of infectious diseases and an increasing burden due to NCDs. Cardiovascular diseases, diabetes mellitus, cancers, osteoarthritis, mental illness, and injuries are among the major NCDs in this region, with high morbidity and mortality. In addition, these diseases cause pain, disability, loss of income, disruption of family stability, and an impaired quality of life.

Disease Transition in sub-Saharan Africa

For many centuries, communicable diseases were the main causes of death around the world. Life expectancy was often limited by uncontrolled epidemics that devastated communities. In 1900, the average life expectancy worldwide was about forty-seven years, and

there were few differences among different countries. The leading causes of death worldwide were communicable diseases and nutritionally related conditions. Infant and childhood mortality was high because of infections and poor nutrition – the short average life span mainly reflected high mortality in the early years of life. During the first half of the twentieth century, after the second World War, the high-income, industrialized countries of the world made major advances against infectious and childhood diseases through improved public health measures, nutrition, vaccines, and, to a lesser degree, antibiotics. Childhood mortality declined in these countries, survival to middle and late adult life increased, and non-communicable diseases emerged in the middle of the twentieth century as the major threat to health. Non-communicable diseases became a real burden for these developed countries, thereby making these diseases to be associated with economic development and to be known as diseases of the rich.

This "epidemiologic transition" from communicable to non-communicable diseases as the major threats to health did not begin in low-and middle-income countries (LMICs) until the last half of the twentieth century. At the dawn of the third millennium, NCDs appeared sweeping the entire globe and with an increasing trend in developing countries. In sub-Saharan Africa, this transition imposes more difficult problems, considering the double burden of

the still existing infective diseases (such as malaria, gastroenteritis, pneumonia) coupled with the non-infective diseases, in a resource poor environment characterized by inadequate and moribund healthcare delivery systems.

Recently, Dr. Margaret Chan, the Director General of the World Health Organization, while addressing the first Global Forum of the Non-communicable Disease Network in Geneva, stated that the NCDs “have changed places.” These diseases, such as cardiovascular diseases, cancers, diabetes, chronic respiratory diseases and mental disorders, which were once associated with abundance are now heavily concentrated in poor and disadvantaged groups. This shift in the disease burden could be attributed to some powerful global forces that are shaping health conditions everywhere. These include demographic ageing, rapid unplanned urbanization, and the globalization of unhealthy lifestyles which are universal trends. However, the consequences are not evenly felt. Developing countries, especially in the sub-Saharan region, have the greatest vulnerability and the least resilience. They are hit the hardest, have the least capacity to cope and cannot afford the costs of chronic care. They have grossly inadequate numbers of staff, shortages of medication and funds, as well as in some cases, a total lack of insurance schemes to protect patients from catastrophic healthcare costs.

Unfortunately, this dismal picture is further compounded with the emergence of a new epidemic plague, HIV/AIDS (human immunodeficiency virus/acquired immunodeficiency syndrome) in the eighties, as well as the threat of avian and swine influenza infections. Many countries in sub-Africa have high infection rates for HIV, and the disease principally affects young adults and newborn infants in these areas. From 1980 onwards, the rapid transmission of this fatal disease has not been preventable except by behavioral change; there is no vaccine for prevention, and affordable treatment has not been available in low-income countries until recently. This leaves many countries with a double burden of health problems – a new epidemic of infectious disease and unresolved infectious conditions, as well as a growing set of non-communicable diseases.

Non-communicable diseases are associated with costly and prolonged treatment, which raises the equity problem between and within countries, thereby negating the important primary health care principle of equitable distribution of scarce resources. There is an obvious contrast in opportunities of treatment within developing countries; between the poor and the rich, between cities and rural areas and also between men and women. In order to reverse the increasing trend of the burden caused by non-communicable diseases in sub-Saharan African

countries, or at least to control it, the focus must be on the risk factors associated with these diseases.

Causes and Prevention of Non-communicable Diseases

Risk Factors

The causes of non-communicable diseases are often divided into modifiable and non-modifiable factors, although these distinctions are blurring with greater knowledge. Chronic diseases result from genetic, behavioral, and environmental factors and the interactions between them. These factors, generally termed "risk factors," produce molecular and structural changes in organs and tissues but produce few if any early symptoms or signs of disease. After relatively long periods of time, usually years and decades, disease manifestations and impairment of health result. Risk factors place an individual at a greater likelihood of developing disease, but do not predict disease with absolute certainty. Several risk factors are involved in the causation of most chronic non-communicable diseases.

At the population level, a high prevalence of risk factors can put populations or communities at greater risk and result in more disease. Risk factors for future disease development and early structural changes may be found during the "silent" or pre-symptomatic period before

disease becomes manifest. This can be done with the help of screening programmes, whereby rapidly applied tests, examinations or other procedures are carried out on apparently healthy individuals, for the purpose of sorting out those who have a disease or are at greater risk of developing the disease from those who do not.

The prevention of non-communicable diseases entails a definition of the risk factors and application of interventions to favorably alter risk before overt symptoms or signs develop. At an even earlier level, it may be possible to prevent the development of risk factors through changes in the environment and personal health behaviors. Primary prevention of chronic disease is therefore an important goal, as morbidity and mortality may be averted or forestalled, and promotion of health, or "primordial prevention," is perhaps the foremost goal. Because most chronic diseases take years to develop, with overt manifestations occurring in middle to late adult life, there is considerable potential for early identification and modification of risk in childhood, adolescence, and early adulthood.

Genetic susceptibility or predisposition is a major non-modifiable individual risk for non-communicable disease. This has a very important influence on disease development, but does not confer an absolute certainty that a disease will occur. Age is another non-modifiable

factor in development of chronic disease. The more one ages, the more likely the long-term exposure to factors that lead to development of non-communicable diseases.

General Environmental Exposures

Environmental exposures can be categorized into general environmental exposures and personal environmental exposures. The general environment encompasses the social, cultural, and public health aspects of life over which individuals can exert little or no personal control. For example, the quality of air and of drinking water or the exposures in the workplace environment are managed or regulated by public health or industrial organizations.

The community environment can be made more conducive to personal behaviors that decrease the risk of chronic disease. For example, provision of safe and pleasant community venues for walking or other physical activity can help individuals to develop and maintain personal commitments to increasing physical activity. Similarly, the availability of fresh fruits and vegetables at reasonable prices in local markets can foster healthful purchases and eating behaviors.

Other social and environmental characteristics can have a major influence on health, particularly that of populations. Throughout the world, groups with higher personal income and greater education have better health, less

disease, and live longer. This observation was substantiated throughout the twentieth century and remains a fundamental factor for both communicable and non-communicable diseases. Better income improves access to health services, knowledge about and resources to act on health-promoting behaviors, and homes and workplaces that have less hazardous exposures. Attention to public health measures and availability of basic health services in low-income countries would go a long way in solving the problem of non-communicable diseases.

Personal Environmental Factors

Personal environmental factors include behavioral choices that are made every day, though many behaviors are habitual. These personal behaviors are extraordinarily important and have been termed the underlying or true causes of chronic disease. Use of tobacco, particularly smoking, is the number one preventable cause of death and disability. It directly contributes to ischemic heart disease, stroke, chronic lung disease, and several common cancers, especially lung cancer. These are the leading causes of death in industrialized countries and will be the leading causes worldwide during the coming century. Even exposure of nonsmokers to secondhand smoking increases risk. The prohibition of smoking in public places is an example of a public health regulation that decreases the risk for nonsmokers.

Dietary intake, which includes both the quantity and quality of foods, is highly important in the development of chronic diseases. An intake of calories in excess of what is expended during daily activity leads to obesity and an increased risk of diabetes, high blood pressure, heart disease, and some cancers. Increased physical activity can offset some excess caloric intake and may have additional healthful benefits as well. Since much of the industrialized world now has a predominance of inexpensive, calorically dense food and too little requirement for physical activity, it is not surprising that an epidemic of obesity, and the corresponding increased risk for disease, has occurred. As sub-Saharan African countries gradually move toward economic development and industrialization, there are similar pressures toward high caloric intake and decreased physical activity. This is seen in the recent proliferation of fast food restaurants especially in the urban areas. Dietary patterns have important influences aside from the caloric content. Fruits and vegetables and whole grain products have beneficial effects on health, as does a limitation of fat intake to no more than 30 percent of calories.

Other personal behaviors and circumstances contribute to non-communicable disease development. Alcohol use has both adverse and beneficial effects. Non-pregnant individuals and groups consuming small amounts of alcohol (about one drink per day) experience less ischemic heart disease. However, large amounts (about four or

more drinks per day) contribute to chronic liver disease, depression and suicide, and injuries, especially motor vehicular injuries. Any alcohol use during pregnancy carries a risk for impaired fetal development. Illicit drugs are addictive and impair social and occupational functioning and are associated with impaired mental health, notably depression. Both alcohol and illicit drugs can have long-term effects on intellect.

At this stage, it will be necessary to discuss some common non-communicable diseases that affect the people of Nigeria.

HYPERTENSION

Hypertension belongs to the group of disorders of the heart and blood vessels known as cardiovascular diseases. Other members of the group include coronary heart disease (heart attack), cerebrovascular disease (stroke), peripheral vascular disease, heart failure, rheumatic heart disease, congenital heart disease and cardiomyopathies. These entities are major contributors of the non-communicable diseases. Once associated with industrialized countries, cardiovascular diseases are now emerging or rapidly increasing in developing countries. It is predicted that in the present decade, cardiovascular diseases will be the leading cause of death in developing countries as a consequence of lifestyle changes brought about by industrialization and urbanization associated with

social transition. These diseases are promoted by risk factors like tobacco use, alcohol, physical inactivity and unhealthy diet. It is estimated that nearly one billion people are affected by hypertension worldwide, and this figure is predicted to increase to 1.5 billion by 2025.

According to various studies, the prevalence of hypertension ranges between 10% and 20% in Nigeria. A survey by the expert committee on non-communicable diseases in Nigeria revealed the prevalence of hypertension in adult Nigerians aged 15 years and above, after adjusting to the cut-off point of 140/90 mmHg, to be 17% and 20% respectively in rural and urban communities.

Definition

Hypertension or high blood pressure means high pressure (tension) in the arteries. Arteries are vessels that carry blood from the pumping heart to all the tissues and organs of the body. Hypertension is a chronic medical condition which can be classified as either primary (essential) or secondary. About 90-95% of the cases are termed ‘primary hypertension’ in which no medical cause can be found. The remaining 5-10% of cases (secondary hypertension) are caused by conditions that affect the kidneys, arteries, heart or the endocrine system.

Persistent and uncontrolled hypertension is one of the risk factors for stroke (brain damage), heart attack, hardening of the arteries (atherosclerosis or arteriosclerosis), heart failure and arterial aneurysm, eye damage and is also a leading cause of kidney failure. These complications of hypertensions are often referred to as end-organ damage because damage to these organs is the end result of chronic (long duration) high blood pressure. Moderate elevation of arterial blood pressure leads to shortened life expectancy. Dietary and lifestyle changes as well as medicines can improve blood pressure control and decrease the risk of associated health complications.

Classification

Blood pressure is classified based on two types of measurements, the systolic and diastolic blood pressures expressed as a ratio such as '110 over 70' (110/70 mmHg). The top number, the systolic blood pressure, corresponds to the pressure in the arteries as the heart contracts and pumps blood forward into the arteries. The bottom number, the diastolic blood pressure, represents the pressure in the arteries as the heart relaxes after the contraction. The diastolic pressure is the lowest pressure to which the arteries are exposed. It was previously thought that rises in diastolic pressure were a more important risk factor than systolic elevations, but it is now

known that in people 50 years and above systolic hypertension represents a greater risk.

Even though hypertension is considered to be blood pressure of 140/90 mmHg and higher for the general population, these levels may not be appropriate cut-offs for all individuals. Many experts in the field of cardiology view blood pressure levels as a range, from lower levels to higher levels. American Heart Association (2003) classified hypertension as follows:

Classification	Systolic pressure (mmHg)	Diastolic pressure mmHg)
Normal	90-119	60-79
Pre-hypertension	120-139	80-89
Stage 1	140-159	90-99
Stage 2	≥160	≥100
Isolated systolic hypertension	≥140	<90

Individuals with pre-hypertension (defined as a blood pressure between 120/80 and 139/89) may benefit from lowering of blood pressure by lifestyle modification and possibly medication, especially if there are other risk factors for end-organ damage such as diabetes or kidney disease.

For some people, blood pressure readings of lower than 140/90 may be a more appropriate normal cut-off level. For example, patients with long standing (chronic) kidney diseases that spill (lose) protein into the urine (proteinuria) or with diabetes mellitus, the blood pressure is ideally kept at 130/80 or even lower. The purpose is to slow the progression of kidney damage. In addition, the people of the Black race, who have an increased risk of developing the complications of hypertension, may decrease this risk by reducing their systolic blood pressure to less than 135 and the diastolic blood pressure to 80 mmHg or less. Statistical analysis has shown that beginning at a blood pressure of 115/75, the risk of cardiovascular disease doubles with each increase in blood pressure of 20/10.

Isolated systolic hypertension is a systolic blood pressure that is above 140 mmHg with a diastolic pressure that is still below 90. This disorder primarily affects older people and is characterized by an increased (wide) pulse pressure. The pulse pressure is the difference between

the systolic and diastolic blood pressures. Stiffening of the arteries contributes to this widening of the pulse pressure. A high pulse pressure is an important precursor or indicator of health problems and potential end-organ damage. Isolated systolic hypertension is associated with a two to four times increased future risk of an enlarged heart, a heart attack (myocardial infarction), a stroke (brain damage), and death from heart disease or a stroke. Clinical studies have shown that a reduction in systolic blood pressure in patients with systolic hypertension by at least 20 mmHg to a level below 160 mmHg reduces these increased risks.

'White coat hypertension' is an increase in blood pressure that is noted only in the doctor's office. The name suggests that the physician's white coat induces the patient's anxiety and a brief increase in blood pressure. This finding may be misleading because the elevation may be only temporary. However, caution is warranted in assessing this situation; other stresses in a patient's life may also cause elevations in the blood pressure. Monitoring blood pressure at home by blood pressure cuff or continuous monitoring equipment or at a pharmacy can help estimate the frequency and consistency of higher blood pressure readings. Additionally, conducting appropriate tests to search for other complications of hypertension can help evaluate the significance of variable blood pressure readings.

Borderline hypertension is defined as mildly elevated blood pressure higher than 140/90 mmHg at some times, and lower than that at other times. People with this problem have the tendency as they get older to develop more sustained or higher elevations of blood pressure. They have a moderately increased risk of developing heart-related (cardiovascular) disease. Therefore, even if the hypertension does not appear to be significant initially, people with borderline hypertension should have continuing follow-up of their blood pressure and monitoring for the complications of hypertension.

Causes of Hypertension

There are two types of hypertension; namely essential (or primary hypertension) and secondary hypertension. Essential hypertension is a far more common condition and accounts for 95% of hypertension. The cause of essential hypertension is multi-factorial, i.e. there are several factors whose combined effects produce the condition. In secondary hypertension, which accounts for 5% of hypertension, the high blood pressure is secondary to or caused by a specific abnormality in one of the organs or systems of the body.

The factors that increase the risk of developing essential hypertension include sedentary life style (i.e. lack of exercise), stress, visceral (abdominal) obesity, potassium deficiency (hypokalaemia), obesity (more than 85% of

cases occur in those with a body mass index of more than 25 kg/m^2), overuse of salt, alcohol intake, and vitamin D deficiency. Risk also increases with aging, some inherited genetic mutations, and having a family history of hypertension. An elevation of rennin, an enzyme secreted by the kidney, is another risk factor, as is sympathetic nervous system overactivity. Insulin resistance which is a component of the metabolic syndrome is also thought to contribute to hypertension. Recent studies have implicated low birth weight as a risk factor for adult essential hypertension.

Approximately 30% of cases of essential hypertension are attributable to genetic factors. In the United States, the incidence of high blood pressure is greater among African Americans than among Caucasians or Asians. Also, in individuals who have one or two parents with hypertension, high blood pressure is twice as common as in the general population.

Symptoms of Hypertension

Uncomplicated hypertension usually occurs without any symptoms (silently) and so has been labeled the “silent killer”. This is because the disease can progress to any one or more of the potentially fatal complications such as heart attack or stroke. Uncomplicated hypertension may be present and remain unnoticed for many years, or even decades. This happens when there are no symptoms, and

those affected fail to undergo periodic blood pressure screening.

Some people with uncomplicated hypertension, however, may experience symptoms such as headache, dizziness, shortness of breath and blurred vision. The presence of symptoms can be a good thing in that they can prompt people to consult a doctor for treatment and make them more compliant in taking their medications. Often, however, a person's first contact with a physician may be after significant damage to the end-organs has occurred. In many cases, a person visits or is brought to the doctor or an emergency room with a heart attack, stroke, kidney failure, or impaired vision (due to damage to the back part of the retina). Greater public awareness and frequent blood pressure screening may help to identify patients with undiagnosed high blood pressure before significant complications have developed.

Hypertension in pregnant women is known as pre-eclampsia. This can progress to a life-threatening condition called eclampsia, which is the development of protein in the urine, generalized swelling and severe seizures.

Prevention

A prolonged assessment period within which repeated measurements of blood pressure are taken provides the

most accurate assessment of blood pressure levels. Following this, lifestyle changes are recommended to lower blood pressure, before the initiation of prescription drug therapy. The British Hypertension Society suggests the following lifestyle changes in managing pre-hypertension:

- Weight reduction and regular aerobic exercises e.g. walking. Regular exercise improves blood flow and helps to reduce the resting heart rate and blood pressure.

- Reducing dietary sugar intake.

- Reducing sodium (salt) in the diet. This step decreases blood pressure in about 33% of people. Some people use a salt substitute to reduce their salt intake.

- Using the DASH diet (**d**ietary **a**pproaches to **s**top **h**ypertension), which is rich in fruits and vegetables and low-fat or fat-free dairy products. In addition, an increase in dietary potassium, which offsets the effect of sodium, has been shown to be highly effective in reducing blood pressure.

- Discontinuing tobacco use and alcohol consumption has been shown to lower blood pressure. Abstaining from cigarette smoking reduces the risk

of stroke and heart attack, which are associated with hypertension.

- Reducing stress, for example with relaxation therapy, such as meditation and other mind/body relaxation techniques, by reducing environmental stress such as high sound levels and over-illumination can also lower blood pressure.

Treatment

The costly and prolonged care of hypertension in Nigeria and other developing countries often diverts the scarce family and societal resources to medical care. The first line of treatment for hypertension is the same as the recommended preventive lifestyle changes such as dietary changes, physical exercise, and weight loss, which have all been shown to significantly reduce blood pressure in people with hypertension. If hypertension is high enough to justify immediate use of medications, lifestyle changes are still recommended in conjunction with medication.

The medications for treating hypertension, called antihypertensives, act by lowering the blood pressure. Reduction of the blood pressure by 5-6 mmHg can decrease the risk of stroke by 40%, decrease the risk of heart disease by 15-20% and reduce the likelihood of dementia, heart failure and death.

Commonly used prescription drugs include:

- ACE inhibitors such as captopril, enalapril, fosinopril
- Angiotensin II receptor antagonists may be used where ACE inhibitors are not tolerated e.g. telmisartan, losartan, valsartan (Diovan)
- Calcium channel blockers such as nifedipine (Adalat), amlodipine (Norvasc)
- Diuretics e.g. bendroflumethiazide, chlorthalidone, hydrochlorothiazide (HCTZ)

Other less commonly used prescription drugs include:

- Diuretics such as furosemide or low dosages of spironolactone
- Alpha blockers such as prazosin or terazosin
- Beta blockers such as atenolol, propranolol. These were once first line agents, but are now less commonly used because they increase the risk of diabetes.
- Direct rennin inhibitors such as aliskiren (Tekturna)

Some of these drugs may be combined to produce better effects.

A Quick Look at High Blood Pressure (Hypertension)

- High blood pressure (hypertension) is designated as either essential (primary) hypertension or secondary hypertension and is defined as a consistently elevated blood pressure exceeding 140/90 mmHg.

- In essential hypertension (95% of people with hypertension), no specific cause is found, while secondary hypertension (5% of people with hypertension) is caused by an abnormality somewhere in the body, such as in the kidney, adrenal gland, or aortic artery.

- Essential hypertension may run in some families and occurs more often in the Black race, although the genes for essential hypertension have not yet been identified.

- High salt intake, obesity, lack of regular exercise, excessive alcohol or coffee intake, and smoking may all adversely affect the outlook for the health of an individual with hypertension.

- High blood pressure is called "the silent killer" because it often causes no symptoms for many

years, even decades, until it finally damages certain critical organs.

- Poorly controlled hypertension ultimately can cause damage to blood vessels in the eye, thickening of the heart muscle and heart attacks, hardening of the arteries (arteriosclerosis), kidney failure, and strokes.

- Heightened public awareness and screening of the population are necessary to detect hypertension early enough so it can be treated before critical organs are damaged.

- Lifestyle adjustments in diet and exercise and compliance with medication regimes are important factors in determining the outcome for people with hypertension.

- Several classes of anti-hypertensive medications are available, including ACE inhibitors, ARB drugs, beta-blockers, diuretics, calcium channel blockers, alpha-blockers, and peripheral vasodilators.

- Most anti-hypertensive medications can be used alone or in combination: some are used only in combination; some are preferred over others in certain specific medical situations; and some are not to be used (contraindicated) in other situations.

- The goal of therapy for hypertension is to bring the blood pressure down to 140/85 in the general population and to even lower levels in diabetics, people of the Black race, and people with certain chronic kidney diseases.

- Screening, diagnosing, treating, and controlling hypertension early in its course can significantly reduce the risk of developing stroke, heart attack, or kidney failure.

DIABETES MELLITUS

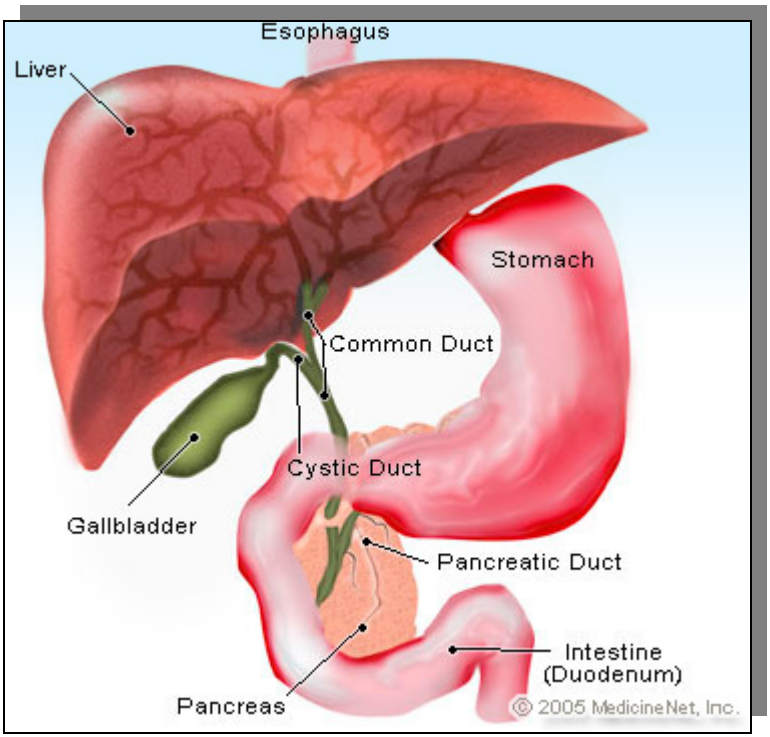
Diabetes mellitus is a group of metabolic diseases characterized by high blood sugar (glucose) levels that result from defects in insulin secretion, or action, or both. Diabetes mellitus, commonly referred to as diabetes was first identified as a disease associated with "sweet urine," and excessive muscle loss in the ancient world. Elevated levels of blood glucose (hyperglycemia) lead to spillage of glucose into the urine, hence the term sweet urine.

The recent statistics released by the World Health Organization and the International Diabetes Federation calls for immediate concern. The International Diabetes Federation estimates that 285 million people around the world have diabetes. This total is expected to rise to 438 million within 20 years. Each year a further 7 million people develop diabetes. At present there is no cure for

diabetes. It is a chronic medical condition, meaning that although it can be controlled, it lasts a lifetime.

Available data suggest that diabetes is emerging as a major health problem in sub-Saharan Africa, including Nigeria, where it is a considerable cause of morbidity and mortality. A prevalence rate of 6.8% was recorded in Port Harcourt with a male preponderance. The national figures range between 1.5% and 7.4% in some urban centres. The burden of premature death from diabetes is similar to that of HIV/AIDS, yet the problem is largely unrecognized.

Causes of diabetes



Blood glucose levels are usually controlled by insulin, a hormone produced by the pancreas. The pancreas is a deep-seated organ in the abdomen located behind the stomach. Insulin lowers the blood glucose level. When the blood glucose elevates (for example, after eating food), insulin is released from the pancreas to normalize the glucose level. Insufficient production of insulin (either absolutely or relative to the body's needs), production of defective insulin (which is uncommon), or the inability of

cells to use insulin properly and efficiently leads to hyperglycemia and diabetes. This latter condition affects mostly the cells of muscle and fat tissues, and results in a condition known as "insulin resistance." This is the primary problem in type 2 diabetes.

The main disorder in type 1 diabetes is an absolute lack of insulin, usually secondary to a destructive process affecting the insulin producing beta cells in the pancreas. In type 2 diabetes, there is also a steady decline of beta cells that adds to the process of elevated blood sugars. Essentially, if someone is resistant to insulin, the body can, to some degree, increase production of insulin and overcome the level of resistance. After some time, if production decreases and insulin cannot be released as vigorously, hyperglycemia develops.

Glucose is a simple sugar that is found in the food we eat. It is an essential nutrient that provides energy for the proper functioning of the body cells. Carbohydrates are broken down in the small intestines and the glucose in digested food is then absorbed by the intestinal cells into the bloodstream, and is carried by the bloodstream to all the cells in the body where it is utilized. However, glucose cannot enter the cells alone and needs insulin to aid in its transport into the cells. Insulin is also important in tightly regulating the level of glucose in the blood. Without insulin, the cells become starved of glucose energy despite

the presence of abundant glucose in the bloodstream. In certain types of diabetes, the cells' inability to utilize glucose gives rise to the ironic situation of "starvation in the midst of plenty". The abundant, unutilized glucose is wastefully excreted in the urine.

Types of Diabetes

There are two major types of diabetes, called type 1 and type 2. Type 1 diabetes was also called insulin dependent diabetes mellitus (IDDM), or juvenile onset diabetes mellitus. In type 1 diabetes, the pancreas undergoes an autoimmune attack by the body itself, and is rendered incapable of making insulin. Abnormal antibodies have been found in the majority of patients with type 1 diabetes. Antibodies are proteins in the blood that are part of the body's immune system. The patient with type 1 diabetes must rely on insulin medication for survival.

Type 1 diabetes tends to occur in young, lean individuals, usually before 30 years of age, however, older patients may occasionally present with this form of diabetes. Approximately 10% of all patients with diabetes have type 1 diabetes while the remaining 90% have type 2 diabetes.

Type 2 diabetes was also referred to as non-insulin dependent diabetes mellitus (NIDDM), or adult onset diabetes mellitus (AODM). In type 2 diabetes, patients can still produce insulin, but do so relatively inadequately for

their body's needs, particularly in the face of insulin resistance as discussed above. In many cases this actually means the pancreas produces larger than normal quantities of insulin. A major feature of type 2 diabetes is a lack of sensitivity to insulin by the cells of the body (particularly fat and muscle cells).

In addition to the problems of insulin resistance, the release of insulin by the pancreas may be defective and suboptimal as a result of a steady decline in beta cell production. Type 2 diabetes patients with this problem may ultimately require insulin therapy. Finally, the liver in these patients continues to produce glucose through a process called gluconeogenesis despite elevated glucose levels. The control of gluconeogenesis becomes compromised.

Type 2 diabetes occurs mostly in individuals over 30 years old and the incidence increases with age, although an alarming number of patients who are barely in their teen years are now seen with the ailment. In fact, for the first time in the history of mankind, type 2 diabetes is now more prevalent than type 1 diabetes in childhood. Most of these cases are a direct result of poor eating habits, higher body weight, and lack of exercise.

While there is a strong genetic component to developing this form of diabetes, there are other risk factors – the most significant being obesity. There is a direct

relationship between the degree of obesity and the risk of developing type 2 diabetes, and this holds true in children as well as adults. It is estimated that the chance to develop diabetes doubles for every 20% increase over desirable body weight.

Concerning age, statistics show that for each decade after 40 years of age regardless of weight there is an increase in incidence of diabetes. The prevalence of diabetes in persons 65 to 74 years of age is nearly 20%. Type 2 diabetes is also more common in certain ethnic groups; 6% in Caucasians, 10% in African Americans and Asian Americans, 15% in Hispanics and 20-50% in certain Native American communities. In Nigeria, the prevalence of type 2 diabetes has an upper limit of 7.4%. Finally, diabetes occurs much more frequently in women with a prior history of diabetes that develops during pregnancy, i.e. gestational diabetes. Although gestational diabetes resolves once the baby is born, 25%-50% of women with gestational diabetes will eventually develop type 2 diabetes later in life, especially among those who required insulin during pregnancy and those who remained overweight after their delivery.

"Secondary" diabetes refers to elevated blood sugar levels from another medical condition. Secondary diabetes may develop when the pancreatic tissue responsible for the production of insulin is destroyed by disease, such as

chronic pancreatitis (inflammation of the pancreas by toxins like excessive alcohol), trauma, or surgical removal of the pancreas.

Diabetes can also result from other hormonal disturbances, such as excessive growth hormone production (acromegaly) and Cushing's syndrome. In acromegaly, a pituitary gland tumour at the base of the brain causes excessive production of growth hormone, leading to hyperglycaemia. In Cushing's syndrome, the adrenal glands produce an excess of cortisol, which promotes blood sugar elevation.

In addition, certain medications may worsen diabetes control, or "unmask" latent diabetes. This is seen most commonly when steroid medications (such as prednisone) are taken and also with medications used in the treatment of HIV infection (AIDS).

Symptoms of Diabetes

- The early symptoms of untreated diabetes are due to elevated blood sugar levels, and loss of glucose in the urine. High amounts of glucose in the urine can cause increased urine output and subsequently dehydration, which in turn causes increased thirst and water consumption.

- The inability of insulin to function normally effects protein, fat and carbohydrate metabolism. Insulin is an anabolic hormone that encourages the storage of fat and protein.

- A relative or absolute insulin deficiency eventually leads to weight loss despite an increase in appetite.

- Some untreated diabetes patients also complain of fatigue, nausea and vomiting.

- Patients with diabetes are prone to developing infections of the bladder, skin, and vaginal areas.

- Fluctuations in blood glucose levels can lead to blurred vision.

- Extremely elevated glucose levels can lead to lethargy and coma.

Diagnosis of Diabetes

The fasting blood glucose (sugar) test is the preferred way to diagnose diabetes. It is easy to perform and convenient. After the person has fasted overnight (at least 8 hours), a single sample of blood is drawn and sent to the laboratory for analysis. This can also be done accurately in a doctor's office using a glucose meter.

- Normal fasting plasma glucose levels are less than 100 milligrams per deciliter (mg/dl).

- Fasting plasma glucose levels of more than 126 mg/dl on two or more tests on different days indicate diabetes.

- A random blood glucose test can also be used to diagnose diabetes. A blood glucose level of 200 mg/dl or higher indicates diabetes.

When fasting blood glucose stays above 100mg/dl, but in the range of 100-126mg/dl, this is known as impaired fasting glucose (IFG). While patients with IFG do not have the diagnosis of diabetes, this condition carries with it its own risks and concerns.

- The oral glucose tolerance test is not routinely done anymore, although it is a gold standard for making the diagnosis of type 2 diabetes. It is still commonly used for diagnosing gestational diabetes and in conditions of pre-diabetes, such as polycystic ovarian syndrome.

People with glucose levels between normal and diabetic have impaired glucose tolerance (IGT). People with impaired glucose tolerance do not have diabetes, but are at high risk for progressing to diabetes. Each year, 1%-5% of people whose test results show impaired glucose

tolerance actually eventually develop diabetes. Weight loss and exercise may help people with impaired glucose tolerance return their glucose levels to normal. In addition, some physicians advocate the use of medications, such as metformin (Glucophage), to help prevent/delay the onset of overt diabetes.

Recent studies have shown that impaired glucose tolerance itself may be a risk factor for the development of heart disease. Most physicians are now feel that impaired glucose tolerance is not simply a precursor of diabetes, but is its own clinical disease entity that requires treatment and monitoring.

- Home blood sugar (glucose) testing is an important part of controlling blood sugar. One important goal of diabetes treatment is to keep the blood glucose levels near the normal range of 70 to 120 mg/dl before meals and under 140 mg/dl at two hours after eating. Blood glucose levels are usually tested before and after meals, and at bedtime. The blood sugar level is typically determined by pricking a fingertip with a lancing device and applying the blood to a glucose meter, which reads the value.
- The new continuous glucose sensor systems are used to monitor blood glucose right round the clock. They involve an implantable cannula placed just under the skin in the abdomen or in the arm.

This cannula allows for frequent sampling of blood glucose levels. Attached to this is a transmitter that sends the data to a pager-like device. This device has a visual screen that allows the wearer to see, not only the current glucose reading, but also the graphic trends. In some devices, the rate of change of blood sugar is also shown. There are alarms for low and high sugar levels.

- Diabetes experts feel that these blood glucose monitoring devices give patients a significant amount of independence to manage their disease process.

Acute Complications of Diabetes

1. Severely elevated blood sugar levels due to an actual lack of insulin or a relative deficiency of insulin.

2. Abnormally low blood sugar levels due to too much insulin or other glucose-lowering medications.

Insulin is vital to patients with type 1 diabetes - they cannot live without a source of exogenous insulin. Without insulin, patients with type 1 diabetes develop severely elevated blood sugar levels. This leads to increased urine glucose, which in turn leads to excessive loss of fluid and electrolytes in the urine. Lack of insulin also causes the

inability to store fat and protein along with breakdown of existing fat and protein stores. This dysregulation, results in the process of ketosis and the release of ketones into the blood. Ketones turn the blood acidic, a condition called diabetic ketoacidosis (DKA). Symptoms of diabetic ketoacidosis include nausea, vomiting, and abdominal pain. Without prompt medical treatment, patients with diabetic ketoacidosis can rapidly go into shock, coma, and even death.

Diabetic ketoacidosis can be caused by infections, stress, or trauma, all of which may increase insulin requirements. In addition, missing doses of insulin is also an obvious risk factor for developing diabetic ketoacidosis. Urgent treatment of diabetic ketoacidosis involves the intravenous administration of fluid, electrolytes, and insulin, usually in a hospital intensive care unit.

In patients with type 2 diabetes, stress, infection, and medications (such as corticosteroids) can also lead to severely elevated blood sugar levels. Accompanied by dehydration, severe blood sugar elevation in patients with type 2 diabetes can lead to an increase in blood osmolality which may result to coma.

Hypoglycemia means abnormally low blood sugar (glucose). In patients with diabetes, the most common cause of low blood sugar is excessive use of insulin or other glucose-lowering medications, to lower the blood

sugar level in diabetic patients in the presence of a delayed or absent meal. When low blood sugar levels occur because of too much insulin, it is called an insulin reaction. Sometimes, low blood sugar can be the result of an insufficient caloric intake or sudden excessive physical exertion. Blood glucose is essential for the proper functioning of brain cells. Therefore, low blood sugar can lead to central nervous system symptoms such as dizziness, confusion, weakness and tremors. The treatment of low blood sugar consists of administering a quickly absorbed glucose source e.g. orange juice, soft drinks or glucose tablets

Chronic Complications of Diabetes

The chronic complications of are related to blood vessel diseases and are generally classified into small vessel disease, such as those involving the eyes, kidneys and nerves (microvascular disease), and large vessel disease involving the heart and blood vessels (macrovascular disease). Diabetes accelerates hardening of the arteries (atherosclerosis) of the larger blood vessels, leading to coronary heart disease (angina or heart attack), stroke, and pain in the lower extremities because of lack of blood supply (claudication).

Eye Complications

The major eye complication of diabetes is called diabetic retinopathy. This occurs in patients who have had diabetes for at least five years. Diseased small blood vessels in the back of the eye cause the leakage of protein and blood in the retina. Disease in these blood vessels also causes the formation of small aneurysms (microaneurysms), and new but brittle blood vessels (neovascularization). Spontaneous bleeding from the new and brittle blood vessels can lead to retinal scarring and retinal detachment, thus impairing vision.

To treat diabetic retinopathy a laser is used to destroy and prevent the recurrence of the development of these small aneurysms and brittle blood vessels. Approximately 50% of patients with diabetes will develop some degree of diabetic retinopathy after 10 years of diabetes, and 80% of diabetics have retinopathy after 15 years of the disease. Poor control of blood sugar and blood pressure further aggravates eye disease in diabetes.

Cataracts and glaucoma are also more common among diabetics. Since water passes through the lens of the eye, if blood sugar concentrations vary a lot, the lens of the eye will shrink and swell with fluid accordingly. As a result, blurry vision is very common in poorly controlled diabetes. Patients are usually discouraged from getting a new eyeglass prescription until their blood sugar is controlled.

This allows for a more accurate assessment of what kind of glasses prescription is required.

Kidney damage

Kidney damage from diabetes is called diabetic nephropathy. The onset of kidney disease and its progression is extremely variable. Initially, diseased small blood vessels in the kidneys cause the leakage of protein in the urine. Later on, the kidneys lose their ability to cleanse and filter blood. The accumulation of toxic waste products in the blood leads to the need for dialysis. Dialysis involves using a machine that serves the function of the kidney by filtering and cleaning the blood. In patients who do not want to undergo chronic dialysis, kidney transplantation can be considered.

The progression of nephropathy in patients can be significantly slowed by controlling high blood pressure, and by aggressively treating high blood sugar levels.

Nerve damage

Nerve damage from diabetes is called diabetic neuropathy and is also caused by disease of small blood vessels. In essence, the blood flow to the nerves is limited, leaving the nerves without blood flow, and they get damaged or die as a result (a term known as ischaemia). Symptoms of diabetic nerve damage include numbness, burning, and

aching of the feet and lower extremities. When the nerve disease causes a complete loss of sensation in the feet, patients may not be aware of injuries to the feet, and fail to properly protect them. Shoes or other protection should be worn as much as possible. Seemingly minor skin injuries should be attended to promptly in order to avoid serious infections. Because of poor blood circulation, diabetic foot injuries may not heal. Sometimes, minor foot injuries can lead to serious infection, ulcers, and even gangrene, necessitating surgical amputation of toes, feet, and other infected parts.

Diabetic nerve damage can affect the nerves that are important for penile erection, causing erectile dysfunction (ED, impotence). Erectile dysfunction can also be caused by poor blood flow to the penis from diabetic blood vessel disease.

Diabetic neuropathy can also affect nerves to the stomach and intestines, causing nausea, weight loss, diarrhoea, and other symptoms of gastroparesis (delayed emptying of food contents from the stomach into the intestines, due to ineffective contraction of the stomach muscles).

A Quick Look at Diabetes

- Diabetes is a chronic condition associated with abnormally high levels of sugar (glucose) in the blood.

- Insulin produced by the pancreas lowers blood glucose.

- Absence or insufficient production of insulin causes diabetes.

- The two types of diabetes are referred to as type 1 (insulin dependent) and type 2 (non-insulin dependent).

- Symptoms of diabetes include increased urine output, thirst and hunger as well as fatigue.

- Diabetes is diagnosed by blood sugar (glucose) testing.

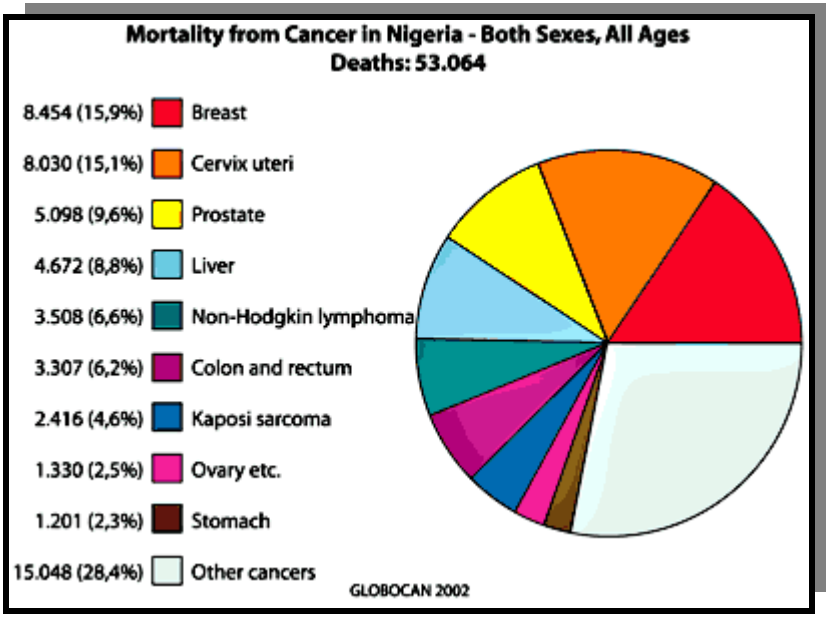
- The major complications of diabetes are both acute and chronic.

  Acutely: dangerously elevated blood sugar, abnormally low blood sugar due to diabetes medications may occur.

  Chronically: disease of the blood vessels (both small and large) which can damage the eye, kidneys, nerves, and heart may occur

- Diabetes treatment depends on the type and severity of the diabetes. Type 1 diabetes is treated with insulin, exercise, and a diabetic diet. Type 2 diabetes is first treated with weight reduction, a diabetic diet, and exercise. When these measures fail to control the elevated blood sugars, oral medications are used. If oral medications are still insufficient, insulin medications are considered.

CANCERS



The World Health Organization (WHO) has identified cancer as one of the major health problems confronting mankind this century. Over 10 million new cases and over 7 million deaths from cancer occurred worldwide in 2000. The developing countries contributed 53% for incidence and 56% for deaths. Between 2000 and 2020, the total number of cases of cancer in the developed world is predicted to increase by 29%, whereas in developing countries an increase of 73% is expected. This is largely as a result of an increase in the number of old people and as a result of urbanization and change in dietary habits.

The three most common cancers in Nigeria are cancer of the breast, closely followed by cancer of the cervix and cancer of the prostate.

Cancer Prevention

The ever-dwindling government funding of health care is inconsistent with the increasing needs brought about by the increasing incidence of cancer in Nigeria. What then can we do in the face of this dilemma? Bearing in mind the WHO statement of 3rd July 2002, that "of the 10 million cancer cases occurring annually, 1/3 can be prevented, another 1/3 can be effectively treated with early diagnosis, and palliative care can improve the quality of life of the last third", it is reasonable to conclude that effective and sustainable cancer control measures are feasible, but will require a concerted effort on the part of

all stake-holders in the country. In particular, it will be important to adopt preventive measures for many cancers, including education against behavior associated with an increased risk and immunization and screening where feasible and cost-effective. For example, cancer of the liver can be effectively prevented through immunization against hepatitis B virus (HBV), as well as through compulsory screening of blood and blood products for HVB and HCV markers and by using disposable needles and syringes. Cervical cancer can be controlled through early detection by a “Pap smear” or by the more sensitive 'visual inspection technique' with acetic acid or Lugol's iodine. Vaccines against human papilloma virus (HPV) have already been shown to be effective, and could eventually effectively prevent cervical cancer. Regular self-examination of the breast after monthly periods and regular mammography examination of the breast will facilitate early detection of breast cancer, although mammography is unlikely to be cost-effective as a screening procedure in resource-poor countries such as Nigeria. Prevention could have a major impact on tobacco-related cancers as well as other tobacco related diseases. Lung cancer, a difficult disease to treat, is easily (in theory!) prevented by not smoking, but it is disappointing to note that, following recent aggressive campaigns against the tobacco industry in most western populations, tobacco companies have now shifted their advertisement to poorer parts of the world. Tobacco abuse has reached

epidemic proportions in many such countries, including Nigeria, and we can anticipate a major increase in tobacco-related diseases in the coming years.

Lastly, cancer control would greatly benefit if the government were to establish a viable National Cancer Institute, with the objectives of providing clinical and investigative facilities for cancer care and research, the provision of postgraduate training in cancer, the coordination of cancer control activities in Nigeria and the encouragement of collaboration with cancer centres in other parts of the world. In order to identify areas deserving of major efforts, and to monitor the outcome of interventions, a Nigerian Cancer Institute should also monitor cancer trends in the country.

BREAST CANCER

According to the International Agency for Research on Cancer (IARC), there were over a million new cases of breast cancer in the world in the year 2000, making it the second most common in the world and the most common among women with 47% in the developing countries. Although rates are five times higher in industrialized countries, the burden of disease is heavier in poorer countries because breast cancer is highly curable if detected early and, unfortunately, about 80% of the cases are detected at advanced stages in developing countries.

Breast cancer is the commonest cancer among Nigerian women and globally. The national prevalence rate of breast cancer is 116 per 100,000 women. The youngest age recorded was 16 years, from Lagos. The peak age of incidence is 42.6 years, and 12% of cases occurred before 30 years while postmenopausal women accounted for 20% of cases. The researchers had the impression that "...these parameters may be more reflective of the demographic profile of Nigeria than an inherent difference in epidemiological characteristics of breast cancer in Nigeria..." .In Nigeria, late presentations of breast cancer cases have also been consistent for three decades and there is no established national screening program for breast cancer.

Breast cancer is of great concern to the public because it is highly dreaded, and elicits fears related to loss of body image and sexuality, surgery and death. As is the case for most cancers, the exact cause of breast cancer is not clearly known. Furthermore, there is currently no cure for advanced disease, and there is no definitive way of preventing it. The good news is that our knowledge of how breast cancer develops is expanding rapidly. As a result, new medications are being developed to reduce the risk of breast cancer among women at high risk of contracting this disease. For the majority of women, lifestyle changes, a healthy diet, cautious use of selected antioxidants, exercise, and weight reduction can also help

reduce the chance of developing breast cancer. To date, the most important strategy in improving survival is still breast cancer screening and early detection.

The risk of breast cancer is high for women with previous breast cancer, those who have first-degree relatives with breast cancer, those with multiple family members with cancer, and those who have inherited "cancer genes."

Biological Causes of Breast Cancer

Breast cancer results from cells that multiply without restraint, thereby forming a tumor and invading adjacent tissues and organs. These cancer cells can further break away and migrate to distant parts of the body in a process called metastasis. The ability to multiply without restraint, the tendency to invade other organs, and the ability to metastasize to other parts of the body are the key characteristics of all cancers – characteristics that are due to DNA defects.

The cancer-causing DNA defects can be acquired at birth (inherited) or may develop during adult life. The inherited DNA defects are present in every cell of the body. On the other hand, DNA defects that develop during adult life are confined to the descendants (products of cell divisions) of the single affected cell. Generally, inherited DNA defects have a greater tendency to cause cancers and cancers

that occur earlier in life than DNA defects that develop during adult life.

Research has shown that 5%-10% of breast cancers are associated with mutations (defects) in two genes known as breast cancer-associated (BRCA) genes, BRCA1 and BRCA2. These genes function to prevent abnormal cell growth that could lead to cancer. Every cell in the body has two BRCA1 or BRCA2 genes, one inherited from each parent. A woman who has received one defective BRCA1 or BRCA2 gene from one parent and a healthy gene from the other is called a carrier of the defective BRCA gene. Even though only one healthy BRCA1 or BRCA2 gene is needed to help prevent cancerous growth of cells, the one remaining healthy BRCA gene is vulnerable to damage during adult life by environmental factors such as toxins, radiation, and other chemicals such as free radicals. Therefore, women bearing a defective BRCA1 or BRCA2 gene are at an increased risk of developing breast and ovarian cancers. Women carrying defective BRCA1 or BRCA2 genes also tend to develop these cancers earlier in life. Other rare genetic mutations are also associated with an increased risk for the development of breast cancer.

Other substances such as estrogen (a female hormone) and certain fatty acids may also increase the risk of breast cancer by stimulating the growth and division of cells of the breast tissue.

Risk Factors for Developing Breast Cancer

The most significant risk factors for breast cancer are **gender and age.** Men can develop breast cancer, but women are 100 times more likely to develop breast cancer than men. Breast cancer is 400 times more common in women who are 50 years old as compared to those who are 20 years old.

Family history

Another important risk factor is having first-degree relatives (mother, sister, or daughter) with breast cancer or male relatives with prostate cancer. The risk is especially higher if both the mother and sister have had breast cancers, if the cancers in first-degree relatives occurred early in life (before age 50), or if the cancers in these relatives were found in both breasts. Having a male relative with breast cancer and having both relatives with breast and ovarian cancers also increase a woman's risk of developing breast cancer. Families with multiple members with other cancers may have a genetic defect leading to a higher risk of breast cancer.

Women who have inherited defective BRCA1, BRCA2, and other defective genes have an increased risk of developing breast cancer, sometimes at early ages, as discussed previously. But even in the absence of one of the known predisposing genetic defects, a strong family history may

signify an increased risk because of genetic or environmental factors that are specific to that particular family. For example, increased risk in families could be due to exposure to similar environmental toxins in some cases. After careful counseling, some patients with BRCA mutations may eventually elect to undergo preventive mastectomy to reduce the risks of breast cancer.

Preventive or prophylactic mastectomy is the surgical removal of one or both breasts in women who have moderate to high risk of developing breast cancer. Surgical reconstruction of the breasts can be done at the time of surgery.

Previous breast cancer

A woman with a history of breast cancer can develop a recurrence of the same breast cancer years later if the cancer cells had already spread to the lymph nodes or other parts of the body. A woman with previous breast cancer also has a three- to fourfold greater chance of developing another breast cancer in the opposite breast.

Other breast conditions

Even though most women with fibrocystic breasts and its related breast symptoms do not have increased risk of developing breast cancer, the lumpy texture and density of the breasts may hamper early cancer detection by breast examination or by mammography.

Breast biopsies sometimes may reveal abnormal, though not yet cancerous, cell changes (called atypical hyperplasia). Women with this problem have a four- to five-fold enhanced likelihood of developing breast cancer. Some other benign cell changes in breast tissue may also be associated with a slight increase (one and a half to two times normal) in risk. These are termed hyperplasia of breast tissue without atypia, sclerosing adenosis, fibroadenoma with complex features, and solitary papilloma.

The common benign breast tumor known as a fibroadenoma, unless it has unusual features under the microscope, does not confer an increased cancer risk.

Radiation therapy

Women with a history of radiation therapy to the chest area as treatment for another cancer (such as Hodgkin's disease or non-Hodgkin's lymphoma) have a significantly increased risk for breast cancer, particularly if the radiation treatment was received at a young age.

Hormonal factors

Women who started their menstrual periods before age 12, those who have late menopause (after age 55), and those who had their first pregnancy after age 30, or who have never had children, have a mildly increased risk of developing breast cancer (less than two times the normal risk). Early onset of menses, late arrival of menopause, and late or no pregnancies are all factors that increase a woman's lifetime level of estrogen exposure.

Studies have confirmed that long-term use (several years or more) of hormone therapy (HT) after menopause, particularly estrogens and progesterone combined, leads to an increase in risk for development of breast cancer. This risk appears to return to normal if a woman has not used hormone therapy for five years or more. Similarly, some studies show birth control pills cause a small increased risk of breast cancer, but this risk also returns to normal after 10 years of nonuse. The decision whether to use hormone therapy or birth control pills involves weighing the risks versus the benefits and should be individualized after consulting one's doctor.

Lifestyle factors

Dietary factors such as high-fat diets and alcohol consumption have also been implicated as factors that increase the risk for breast cancer. Cigarette smoking, caffeine intake, antiperspirant use, and stress do not appear to increase the risk of breast cancer. It is important to remember that 75% of women who develop breast cancer have no risk factors other than age. Thus, screening and early detection are important to every woman regardless of the presence of risk factors.

Importance of Early Breast Cancer Detection

Breast cancer is treatable if diagnosed early. It is considered a "favorable" cancer because it can be detected early by breast examination or by mammography.

Studies have clearly shown that the smaller the size of the breast cancer when detected, the better the chance of a surgical cure and long term survival. The likelihood of a cure is also higher if the cancer is removed before it has spread to lymph nodes and other organs such as the lungs, liver, bones, and brain.

Currently, mammography and breast examinations serve as the foundation for screening for breast cancer. It is extremely important for a woman to have regular breast examinations as well as mammograms to detect early breast cancer.

Mammogram is an x-ray examination of the breast that has the ability to detect a cancer in the breast when it is quite small, long before it may be felt by breast examination. The American Cancer Society (ACS) recommends a baseline mammogram for all women by age 40 and annual mammograms for **women 40 and older for as long as they are in good health.**

Breast examination by palpation and visual inspection is also important. During a routine physical check-up, a doctor can conduct an examination of the breast. The woman should also perform breast self-examination monthly.

Breast Self-Examination and Breast Examinations by Your Doctor

- All women over age 20 should perform breast self-examination monthly.
- Those over age 40 should also have annual breast examinations by their doctors.
- Those younger than 40 years can have breast examinations by their doctors every three years.
- For women with higher than normal risk, a good program would include monthly breast self-examination and twice-yearly focused physician

examination. Any palpable changes in the breasts require further evaluation with mammography and ultrasound.

How to Perform Breast Self-Examination

Breast self-examination is best performed when the hormone stimulation of the breast is the least. This typically occurs seven to 10 days after the start of a menstrual cycle (or three days after a period). At that point, the fluid retention of the breast and the cellular proliferation are the lowest. An ideal setting in which to conduct the exam is the bath or shower.

1. With the hand and breast wet with soap, begin with the fingers flat together and work sweeping from the outer part to the center of the breast. It helps to mentally divide the area to be examined into quadrants and work around the quadrants sequentially. The upper outer quadrant should be mentally extended into the armpit along the chest wall. This area should be carefully included in the examination.

2. The process is repeated in the same sequence with the fingers moving in a fluttering motion. These different motions, flat fingered stroking and fluttering fingertips, allow detection of somewhat different tissue abnormalities.

3. This examination by feeling the breast (palpation) should be accompanied by a brief visual exam. With the arms at the side looking in a mirror, note the symmetry. Then raise the arms slowly overhead, checking for any areas of pulling in of the skin or visible lumps or distortion.

The entire examination process can be done in a few minutes' time.

Any detected change from the usual appearance or feel should be reported to the doctor. If there are any areas of concern that can be felt (palpable) and the mammogram does not show an abnormality, then a specialized breast ultrasound can be extremely helpful.

Diet to reduce breast cancer risk

Theoretically, there are dietary measures that can decrease free-radical formation and reduce the risk of developing breast and other types of cancer. These measures are:

- diets rich in vegetables and fruits,
- diets low in fats, and red and overcooked meats,
- reasonable intake of anti-oxidants such as vitamins E and C,

- regular exercise and weight reduction, and
- avoiding cigarettes.

Evidence that these measures reduce the chances of developing breast cancer is largely based on epidemiological data. Epidemiological evidence is derived from comparing two large populations with similar characteristics that have different diets or levels of exercise. Epidemiological evidence can only be suggestive, not conclusive. In fact, concrete proof that diet and exercise actually reduce the risk of developing breast cancer will be difficult to attain.

Doctors are comfortable with recommending one multivitamin a day. However, there is no clinical evidence that taking mega-doses of vitamins are of any benefit. Mega-doses of certain vitamins can have adverse side effects.

Exercise

There is epidemiological data which show that women who exercise regularly have a lower incidence of breast cancer than women who do not exercise. The reason for such a benefit is unknown, but it may be related to the fact that obese individuals have higher levels of estrogen in the body than non-obese people. The higher levels of

estrogen may increase the risk of breast cancer in obese women.

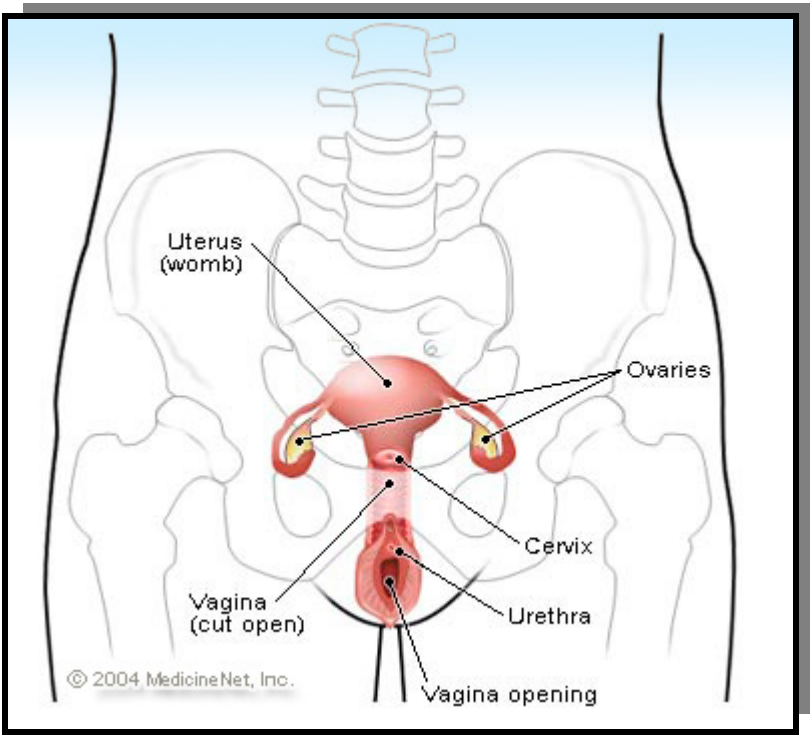
Conclusions

There are two important aspects in breast-cancer prevention: early detection and risk reduction. Screening may identify early noninvasive cancers and allow treatment before they become invasive or identify invasive cancers at an early treatable stage. But screening does not, per se, prevent cancer. Breast-cancer prevention really must be understood as risk reduction. In extremely high-risk patients, such as those who have BRCA mutations, risk reduction may involve prophylactic surgical removal of the breasts and ovaries. For the average patient, lifestyle modifications (diet, exercise, weight-loss, etc.) may be easily recommended and have many other benefits. For patients who have an increased risk based on other factors, the use of hormone-blocking agents, in addition to the usual lifestyle recommendations, may also be considered.

CERVICAL CANCER

The cervix is part of the female reproductive system that is situated in the pelvis. It is the tubular, lower, and narrow part of the uterus (womb).

Cervical cancer begins in cells on the surface of the cervix. Over time, the cervical cancer can invade more deeply into the cervix and nearby tissues. The cancer cells can spread (metastasize) by breaking away from the original (primary) tumor. They enter blood vessels or lymph vessels, which branch into all the tissues of the body. The cancer cells may attach to other tissues and grow to form new tumors that may damage those tissues.



About 80% of the new cases of cervical cancer occur in the developing countries where it constitutes a major health problem. In developed countries, screening

programmes and early detection have led to a noticeable decline in cervical cancer incidence and mortality, but in developing countries, owing to their limited healthcare resources and inefficient or lack of strategies, the problem has continued to escalate. It is the second commonest cancer in Nigeria.

The incidence rate of cervical cancer in Nigeria is approximately 25 per 100,000. There are 32 million women aged 15–64 years old. If we were to conduct a one-time screening over one year, 8000 new invasive cervical cancers would be detected.

Risk Factors and Causes of Cervical Cancer

Studies have found a number of factors that may increase the risk of cervical cancer. For example, infection with HPV (human papillomavirus) is the main cause of cervical cancer. HPV infection and other risk factors may act together to increase the risk even more:

- **HPV infection**: HPV is a group of viruses, transmitted through sexual contact, that can infect the cervix. Chronic HPV infection can cause cervical cancer in some women. It is the cause of nearly all cases of cervical cancer.

- **Lack of regular Pap tests**: Cervical cancer is more common among women who do not have regular Pap tests. The Pap test helps doctors find

abnormal cells. Removing or killing the abnormal cells usually prevents cervical cancer.

- **Smoking**: Among women who are infected with HPV, smoking cigarettes slightly increases the risk of cervical cancer.

- **Weakened immune system** (the body's natural defense system): Infection with HIV (the virus that causes AIDS) or taking drugs that suppress the immune system increases the risk of cervical cancer.

- **Sexual history**: Women who have had many sexual partners have a higher risk of developing cervical cancer. Also, a woman who has had sex with a man who has had many sexual partners may be at higher risk of developing cervical cancer. In both cases, the risk of developing cervical cancer is higher because these women have a higher risk of HPV infection.

- **Using birth control pills for a long time**: Using birth control pills for a long time (5 or more years) may slightly increase the risk of cervical cancer among women with HPV infection. However, the risk decreases quickly when women stop using contraceptive pills.

- **Having many children**: Studies suggest that giving birth to many children (5 or more) may slightly increase the risk of cervical cancer among women with HPV infection.

- **DES** (diethylstilbestrol): DES may increase the risk of a rare form of cervical cancer in daughters exposed to this drug before birth. DES was given to some pregnant women in the United States between about 1940 and 1971. (It is no longer given to pregnant women.)

Having an HPV infection or other risk factors does not mean that a woman will develop cervical cancer. Most women who have risk factors for cervical cancer never develop it.

Symptoms

Early cervical cancers usually don't cause symptoms. When the cancer grows larger, women may notice one or more of these symptoms:

- Abnormal vaginal bleeding

  Bleeding that occurs between regular menstrual periods

  Bleeding after sexual intercourse, douching, or a pelvic exam

  Menstrual periods that last longer and are heavier than before

  Bleeding after going through menopause

- Increased vaginal discharge

Pelvic pain

Pain during sex

Infections or other health problems may also cause these symptoms.

Detection and diagnosis

Women can help reduce their risk of cervical cancer by having regular Pap tests. A Pap test (sometimes called Pap smear or cervical smear) is a simple test used to look at cervical cells. Pap tests can find cervical cancer or abnormal cells that can lead to cervical cancer.

Finding and treating abnormal cells can prevent most cervical cancer. Also, the Pap test can help find cancer early, when treatment is more likely to be effective.

For most women, the Pap test is not painful. It is done in a doctor's office or clinic during a pelvic exam. The doctor or nurse scrapes a sample of cells from the cervix. A laboratory technologist or a pathologist checks the cells under a microscope for cell changes. Most often, abnormal cells found by a Pap test are not cancerous. The same sample of cells may be tested for HPV infection.

Abnormal Pap or HPV test results call for other tests to make a diagnosis:

- **Colposcopy**: The doctor uses a colposcope to look at the cervix. The colposcope combines a bright

light with a magnifying lens to make tissue easier to see. It is not inserted into the vagina. A colposcopy is usually done in the doctor's office or clinic.

- **Biopsy**: Most women have tissue removed in the doctor's office with local anesthesia. A pathologist checks the tissue under a microscope for abnormal cells.

Staging

If the biopsy shows the presence of cancer, the doctor needs to learn the extent (stage) of the disease to help choose the best treatment. Staging is a careful attempt to find out whether the tumor has invaded nearby tissues, whether the cancer has spread and, if so, to what parts of the body. Cervical cancer spreads most often to nearby tissues in the pelvis, lymph nodes, or the lungs. It may also spread to the liver or bones.

When cancer spreads from its original place to another part of the body, the new tumor has the same kind of cancer cells and the same name as the original tumor. For example, if cervical cancer spreads to the lungs, the cancer cells in the lungs are actually cervical cancer cells. The disease is metastatic cervical cancer, not lung cancer. For that reason, it is treated as cervical cancer, not lung cancer. The new tumor is called "distant" or metastatic disease.

A pelvic examination will be done to feel for swollen lymph nodes, and additional tissue may be removed. To learn the extent of disease, the doctor may order some of the following tests:

- **Chest x-rays**: X-rays often can show whether cancer has spread to the lungs.

- **CT scan**: An x-ray machine linked to a computer that takes a series of detailed pictures of the organs. A tumor in the liver, lungs, or elsewhere in the body can show up on the CT scan. A contrast material may be injected into the arm or hand, swallowed by mouth, or given by enema. The contrast material makes abnormal areas easier to see.

- **MRI**: A powerful magnet linked to a computer is used to make detailed pictures of the pelvis and abdomen. These pictures can be viewed on a monitor and printed on the film. An MRI can show whether cancer has spread. Sometimes contrast material makes abnormal areas show up more clearly on the picture.

- **PET scan**: An injection of a small amount of radioactive sugar is given. A machine makes computerized pictures of the sugar being used by cells in the body. Cancer cells use sugar faster than normal cells, and areas with cancer look brighter on the pictures.

The stage is based on where cancer is found. These are the stages of invasive cervical cancer:

- **Stage I**: The tumor has invaded the cervix beneath the top layer of cells. Cancer cells are found only in the cervix.

- **Stage II**: The tumor extends to the upper part of the vagina. It may extend beyond the cervix into nearby tissues toward the pelvic wall (the lining of the part of the body between the hips). The tumor does not invade the lower third of the vagina or the pelvic wall.

- **Stage III**: The tumor extends to the lower part of the vagina. It may also have invaded the pelvic wall. If the tumor blocks the flow of urine, one or both kidneys may not be working well.

- **Stage IV**: The tumor invades the bladder or rectum. Or the cancer has spread to other parts of the body.

- **Recurrent cancer**: The cancer was treated, but has returned after a period of time during which it could not be detected. The cancer may show up again in the cervix or in other parts of the body.

Treatment

Women with cervical cancer have many treatment options. The options are surgery, radiation therapy, chemotherapy, or a combination of methods.

The choice of treatment depends mainly on the size of the tumor and whether the cancer has spread. The treatment choice may also depend on whether the patient would like to become pregnant someday. The doctor usually describes the treatment choices, the expected results of each, and the possible side effects. A treatment plan that meets the medical and personal needs of the patient is then developed.

At any stage of the disease, supportive care is available to relieve the side effects of treatment, to control pain and other symptoms, and to help the patient cope with the feelings that a diagnosis of cancer can bring.

Surgery:

Surgery is an option for women with Stage I or II cervical cancer. The surgeon removes tissue that may contain cancer cells:

- **Radical trachelectomy**: The surgeon removes the cervix, part of the vagina, and the lymph nodes in the pelvis. This option is for a small number of women with small tumors who want to try to get pregnant later on.

- **Total hysterectomy**: The surgeon removes the cervix and uterus.

- **Radical hysterectomy**: The surgeon removes the cervix, some tissue around the cervix, the uterus, and part of the vagina.

With either total or radical hysterectomy, the surgeon may remove other tissues:

- **Fallopian tubes and ovaries**: The surgeon may remove both fallopian tubes and ovaries. This surgery is called a salpingo-oophorectomy.

- **Lymph nodes**: The surgeon may remove the lymph nodes near the tumor to see if they contain cancer. If cancer cells have reached the lymph nodes, it means the disease may have spread to other parts of the body.

After a hysterectomy, women no longer have menstrual periods. They cannot become pregnant.

When the ovaries are removed, menopause occurs at once. Hot flashes and other symptoms of menopause caused by surgery may be more severe than those caused by natural menopause.

For some women, a hysterectomy can affect sexual intimacy. There may be feelings of loss that make intimacy difficult. Sharing these feelings with the partner may be helpful. Sometimes couples talk with a counselor to help them express their concerns.

Precancerous changes in the cervix may be treated with cryosurgery, cauterization, or laser surgery.

Radiation Therapy:

Radiation therapy (also called radiotherapy) is an option for women with any stage of cervical cancer. Women with early stage cervical cancer may choose radiation therapy instead of surgery. It also may be used after surgery to destroy any cancer cells that remain in the area. Women with cancer that extends beyond the cervix may have radiation therapy and chemotherapy

Radiation therapy uses high-energy rays to kill cancer cells. It affects cells only in the treated area.

Two types of radiation therapy may be used to treat cervical cancer. Some women receive both types:

- **External radiation therapy**: A large machine directs radiation at your pelvis or other tissues where the cancer has spread. The treatment usually is given in a hospital or clinic. You may receive external radiation 5 days a week for several weeks. Each treatment takes only a few minutes.

- **Internal radiation therapy**: A thin tube is placed inside the vagina. A radioactive substance is loaded into the tube. The patient may need to stay in the hospital while the radioactive source is in place (up to 3 days). Or the treatment session may last a few minutes, and she can go home afterward. Once the radioactive substance is removed, no radioactivity is left in the body. Internal radiation may be repeated two or more times over several weeks.

Side effects depend mainly on how much radiation is given and which part of the body is treated. These can usually be treated or controlled.

Chemotherapy:

For the treatment of cervical cancer, chemotherapy is usually combined with radiation therapy. For cancer that has spread to distant organs, chemotherapy alone may be used.

Chemotherapy uses drugs to kill cancer cells. The drugs for cervical cancer are usually given through a vein (intravenous). Chemotherapy may be given in a clinic, at the doctor's office, or at home. Some women need to stay in the hospital during treatment.

The side effects depend mainly on which drugs are given and how much. Chemotherapy kills fast-growing cancer cells, but the drugs can also harm normal cells that divide rapidly. These include hair loss, weakness, a poor appetite, nausea and vomiting, diarrhea, or mouth and lip sores. Other side effects include skin rash, tingling or numbness of hands and feet, hearing problems, loss of balance, joint pain, or swollen legs and feet. Most of these side effects cease when treatment ends.

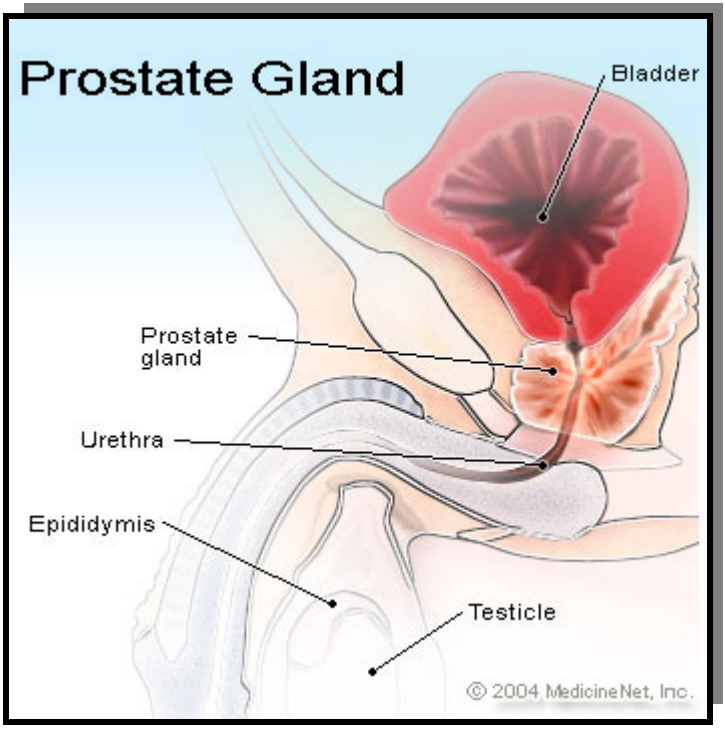
A Quick Look at Cervical Cancer

- Risk factors for cancer of the cervix have been identified.

- Regular pelvic exams and Pap testing can detect precancerous changes in the cervix.
- Precancerous changes in the cervix may be treated with cryosurgery, cauterization, or laser surgery.
- The most common symptom of cancer of the cervix is abnormal bleeding.
- Cancer of the cervix can be diagnosed using a Pap test or other procedures that sample the cervix tissue.
- Cancer of the cervix requires different treatment from cancer that begins in other parts of the uterus.

PROSTATE CANCER

The prostate gland is an organ that is located at the base or outlet (neck) of the urinary bladder.



The gland surrounds the first part of the urethra. The urethra is the passage through which urine drains from the bladder to exit from the penis. One function of the prostate gland is to help control urination by pressing directly against the part of the urethra that it surrounds. Another function of the prostate gland is to produce some of the substances that are found in normal semen, such as minerals and sugar. Semen is the fluid that transports the sperm. A man can manage quite well, however, without his prostate gland.

In a young man, the normal prostate gland is the size of a walnut. During normal aging, however, the gland usually grows larger. This enlargement with aging is called benign prostatic hypertrophy (BPH), but this condition is not associated with prostate cancer. Both BPH and prostate cancer, however, can cause similar problems in older men. For example, an enlarged prostate gland can squeeze or impinge on the outlet of the bladder or the urethra, leading to difficulty with urination. The resulting symptoms commonly include slowing of the urinary stream and urinating more frequently, particularly at night.

Prostate cancer is a malignant (cancerous) tumor (growth) that consists of cells from the prostate gland. The tumor usually grows slowly and remains confined to the gland for many years. During this time, the tumor produces little or no symptoms or outward signs (abnormalities on physical examination). As the cancer advances, however, it can spread beyond the prostate into the surrounding tissues (local spread). Moreover, the cancer also can metastasize (spread even farther) throughout other areas of the body, such as the bones, lungs, and liver. Symptoms and signs, therefore, are more often associated with advanced prostate cancer.

Globally, prostate cancer is the third most common cause of death from cancer in men of all ages and is the most common cause of death from cancer in men over age 75. Prostate cancer is rarely found in men younger than 40. Most experts in this field, therefore, recommend that beginning at age 40, all men should undergo yearly screening for prostate cancer.

Risk Factors for Prostate Cancer

The cause of prostate cancer is unknown, but the cancer is thought not to be related to benign prostatic hypertrophy (BPH). The risk (predisposing) factors for prostate cancer include advancing age, genetics (heredity), hormonal influences, and such environmental factors as toxins, chemicals, and industrial products.

Age: The chances of developing prostate cancer increase with age. Thus, prostate cancer under age 40 is extremely rare, while it is common in men older than 80 years of age. As a matter of fact, some studies have suggested that among men over 80, between 50 and 80% of them may have prostate cancer!

Genetics: Genetics (heredity), as just mentioned, plays a role in the risk of developing a prostate cancer. It is more common in the Black race. For example, African American men have a higher risk of getting prostate cancer than do

Japanese or white American men. Environment, diet, and other unknown factors, however, can modify such genetic predispositions. For example, prostate cancer is uncommon in Japanese men living in their native Japan. However, when these men move to the United States, their incidence of prostate cancer rises significantly. Prostate cancer is also more common among family members of individuals with prostate cancer. Thus, a person whose father, grandfather, or even uncle has prostate cancer is at an increased risk for also developing prostate cancer. To date, however, no specific prostate cancer gene has been identified and verified.

Hormonal influences: Testosterone, the male hormone, directly stimulates the growth of both normal prostate tissue and prostate cancer cells. Not surprisingly, therefore, this hormone is thought to be involved in the development and growth of prostate cancer. The important implication of the role of this hormone is that decreasing the level of testosterone should be (and usually is) effective in inhibiting the growth of prostate cancer.

Environmental factors: Environmental factors, such as cigarette smoking and diets that are high in saturated fat, seem to increase the risk of prostate cancer. Additional

substances or toxins in the environment or from industrial sources might also promote the development of prostate cancer, but these have not yet been clearly identified.

Symptoms of Prostate Cancer

In the early stages, prostate cancer often causes no symptoms for many years. It may be detected as an abnormality of a blood test (PSA) or as a hard nodule (lump) in the prostate gland. The latter may be felt during a routine digital (done with the finger) rectal examination. The prostate gland is located immediately in front of the rectum. As the cancer enlarges and presses on the urethra, the flow of urine diminishes and urination becomes more difficult. Patients may also experience burning with urination or blood in the urine. As the tumour continues to grow, it can completely block the flow of urine, resulting in a painfully obstructed and enlarged urinary bladder.

In the later stages, prostate cancer can spread locally into the surrounding tissue or the nearby lymph nodes, called the pelvic nodes. The cancer then can spread even farther (metastasize) to other areas of the body. The doctor on a rectal examination can sometimes detect local spread into the surrounding tissues. That is, the physician can feel a hard, fixed (not moveable) tumour extending from and beyond the gland. Prostate cancer usually metastasizes

first to the lower spine or the pelvic bones (the bones connecting the lower spine to the hips), thereby causing back or pelvic pain. The cancer can then spread to the liver and lungs. Metastases (areas to which the cancer has spread) to the liver can cause pain in the abdomen and jaundice (yellow colour of the skin) in rare instances. Metastases to the lungs can cause chest pain and coughing.

Screening Tests for Prostate Cancer

Screening tests are those that are done at regular intervals to apparently healthy individuals in order to detect a disease such as prostate cancer at an early stage. If the result of a screening test is normal, the disease is presumed not to be present. If a screening test is abnormal, the disease is then suspected to be present, and further tests usually are needed to confirm the suspicion (that is, to make the diagnosis definitively). Prostate cancer usually is suspected initially because of an abnormality of one or both of the two screening tests that are used to detect prostate cancer. These screening tests are a digital rectal examination and a blood test called the prostate specific antigen (PSA).

In the digital rectal examination, the doctor feels (palpates) the prostate gland with his gloved index finger in the rectum, to detect abnormalities of the gland. Thus,

a lump, irregularity, or hardness felt on the surface of the gland is a finding that is suspicious for prostate cancer. Accordingly, doctors usually recommend doing a digital rectal examination annually in men aged 40 years and above.

The PSA test is a simple, reproducible, and accurate blood test. It is used to detect a protein (the prostate specific antigen) that is released from the prostate gland into the blood. Most importantly, the level of the PSA is usually higher in people with prostate cancer than in people without the cancer. The PSA, therefore, is valuable as a screening test for prostate cancer. Accordingly, doctors usually recommend doing a PSA annually in men aged 50 years and above. Furthermore, for men who have high risks for prostate cancer as discussed above, most doctors recommend starting the PSA screening at an even younger age (for example, at age 40 years).

Results of the PSA test under 4 nanograms per milliliter of blood are generally considered normal. Results between 4 and 10 are considered borderline. These borderline values are interpreted in the context of the patient's age, symptoms, signs, family history, and changes in the PSA levels over time. Results higher than 10 are considered abnormal, suggesting the possibility of prostate cancer. The higher the PSA value, the more likely the diagnosis of prostate cancer. Moreover, the level of PSA tends to

increase when the cancer has progressed from organ-confined prostate cancer to local spread to distant (metastatic) spread. Very high values, such as 30 or 40 and over, are usually caused by prostate cancer.

There may be false-positive elevations in the PSA. These are increases in the PSA that are caused by conditions other than prostate cancer. For example, benign prostatic hypertrophy (BPH) and infection or inflammation of the prostate (prostatitis) from whatever cause can elevate the PSA. It is worthy of note that even a rectal examination or an ejaculation within the prior 48 hours can sometimes elevate the PSA. False-positive elevations are usually in the 4 to10 range, but they can go as high as 25 or 30.

Some modifications have been made on the interpretation of the PSA test results. A recent modification of the PSA test is based on the observation that as men age, the amount of PSA in the blood can normally rise without the presence of a prostate cancer. Thus, doctors can use what is referred to as an age-specific PSA, especially to evaluate borderline values. In the age-specific PSA, the normal values are adjusted for the age of the patient. Accordingly, the age-specific normal ranges are 0 to 2.5 for men in their 40s, 0 to 3.5 in their 50s, 0 to 4.5 in their 60s, and 0 to 6.5 for men 70 and over. Therefore, as an example, a PSA of 4 would be considered borderline for

men in their 30s and 40s, but could be normal for men in their 50s, 60s, and 70s.

Diagnosis of Prostate Cancer

Prostate cancer is diagnosed from the results of a biopsy of the prostate gland. If the digital rectal exam of the prostate or the PSA blood test is abnormal, a prostate cancer is suspected. A biopsy of the prostate is usually then recommended. The biopsy is done from the rectum (trans-rectally) and is guided by ultrasound images of the area. A small piece of prostate tissue is withdrawn through a cutting needle. The TRUS-guided Tru-Cut biopsy is currently the standard method to diagnose prostate cancer. Classically a 6-core set is taken by sampling the base, apex and mid gland on each side of the gland. More cores may be sampled to increase the yield, especially in larger glands. A pathologist then examines the tissue under a microscope for signs of cancer in the cells of the tissue.

When prostate cancer is diagnosed on the biopsy tissue, the pathologist will then grade each of two pieces of the tissue from 1 to 5 on the Gleason scale. The scale is based on certain microscopic characteristics of the cancerous cells and reflects the aggressiveness of the tumour. The two scores are then added together. Sums of 2 to 4 are considered low, indicating a slowly growing tumour. Sums

of 5 and 6 are intermediate, representing an intermediate degree of aggressiveness. Sums of 7 to 10 are considered high, signalling a rapidly growing tumour with the worst prognosis (outcome).

Gleason scores can be helpful in guiding treatment that is based, at least in part, on the aggressiveness of the tumour. The principal application of the Gleason score, however, is in predicting the risk for death from a prostate cancer. The tumour grade strongly affects the prognosis. Higher tumour grades are more frequently associated with lymph node and distant spread (metastases). Thus, recent studies have shown that men with Gleason scores of 2 to 4 face a minimal risk (4 to 7%) of death from prostate cancer over the ensuing 15 years, while men with scores of 8 to 10 face a high risk (60 to 87%) of death from prostate cancer over the 15 year period.

Staging of Prostate Cancer

The staging of a cancer refers to determining the extent of the disease. Once a prostate cancer is diagnosed on a biopsy, additional tests are done to assess whether the cancer has spread beyond the gland. For this assessment, biopsies of the surrounding organs, such as the rectum or urinary bladder, or of the nearby (pelvic) lymph nodes might be done. In addition, imaging tests are usually performed. For example, radionuclide bone scans can

determine if there is a spread of the tumour to the bones. Additionally, CAT scans (coaxial tomography) and MRIs (magnetic resonance imaging) can determine if the cancer has spread to adjacent tissues or organs such as the bladder or rectum or to other parts of the body such as the liver or lungs. Newer scanning using a method called PET scan can sometimes help to detect hidden locations of cancer that has spread to various areas of the body.

In brief, doctors do the staging of prostate cancer based primarily on the results of the prostate biopsy, possibly other biopsies, and imaging tests. In staging a cancer, doctors assign various letters and numbers to the cancer, depending on which of the classifications for staging they use. The numbers and letters in the different classifications define the volume or amount of the tumour and the spread of the cancer. The stage of the prostate cancer, therefore, helps to predict the expected course of the disease and determine the choice of treatment.

Two main systems are used to stage prostate cancer. In the American urologic staging system, stage A describes a minimal cancer that can neither be palpated (felt) on physical examination nor seen by imaging techniques. Such a tumour is so small that it can be detected only by viewing it under a microscope. Stage B refers to a larger cancer that may be palpated, but that still is confined (localized) to the prostate gland. Stage C indicates local

spread beyond the prostate into the surrounding tissues. Stage D1 signifies a spread to the nearby (pelvic) lymph nodes and D2 is for distant spread (metastasis), for example, to the bones, liver, or lungs.

The other main system for staging prostate cancer is called the tumour, nodes, and metastasis (TNM) classification. In this system, T1 and T2 are equivalent to stage A and B (respectively) in the American urologic system. T3 describes cancer that extends just beyond the capsule (coat) of the prostate, and T4 describes cancer that is fixed to the surrounding tissues. N1 is equivalent to Stage D1 and M1 is equivalent to D2.

Treatment Options for Prostate Cancer

Deciding on treatment can be daunting, partly because the options for treatment today are far better than they were ten years ago, but also because not enough reliable data are available on which to base the decisions. Accordingly, scientifically controlled, long term studies are still needed to compare the benefits and risks of the various treatments.

To decide on treatment for an individual patient, doctors categorize prostate cancers as organ-confined (localized to the gland), locally advanced (a large prostate tumor or one that has spread only locally), or metastatic (spread

distantly or widely). The treatment options for organ-confined prostate cancer or locally advanced prostate cancer usually include surgery, radiation therapy, hormonal therapy, cryotherapy, combinations of some of these treatments, and watchful waiting. A cure for metastatic prostate cancer is, unfortunately, unattainable at the present time. The treatments for metastatic prostate cancer, which include hormonal therapy and chemotherapy, therefore, are considered palliative i.e. to slow the growth of the tumor and relieve the symptoms of the patient.

Differences between Hormonal Treatment and Chemotherapy

Hormonal therapy is the treatment of choice for symptomatic advanced prostate cancer. The treatments available for hormonal therapy are:

1. Orchiectomy – the surgical removal of the testicles.

2. Luteinizing hormone-releasing hormone agonists, otherwise known as Lupron and Zoladex, and antiandrogens, specifically a drug called Casodex, each produce symptomatic relief in about 80% of patients. Improvement is often dramatic.

3. Other agents that are helpful include the

following: progrestins such as megastrol acetate given daily orally and other drugs that inhibit androgen production such as aminoglutethimide or ketoconazole. These agents are effective but are difficult to tolerate. Corticosteroids are often given simultaneously.

As opposed to hormonal therapy, chemotherapy provides relief in only 20-25% of symptomatic patients with prostate cancer. Various regimens are being used. Estramustine, cisplatin, 5-FU, vinorelbine, and mitoxantrone are the most popular agents. However, recently Taxol has become the drug of choice used by oncologists in treating hormone-resistant prostate cancer.

When to use hormonal therapy and chemotherapy depends on the nature of the prostate cancer itself. If the prostate cancer is hormone-sensitive, then hormonal therapy is the therapy of choice. When the cancer becomes hormone resistant (for example, manipulation of the hormone levels has no effect on the prostate cancer), then the only potential therapy available to the patient is chemotherapy.

Other factors considered in choosing treatment include the age, general health, and preference of the individual and the Gleason score and stage of the cancer. The results of

the PSA test sometimes also can help to decide on the treatment. For example, a borderline elevation of the PSA (4-10), if shown to be due to a prostate cancer, suggests that the cancer is confined to the gland. If other tests also point to an organ-confined tumor, surgery or possibly radiation can be considered to attempt a cure. In contrast, a very high PSA (for example, over 30 or 40) raises the possibility of metastases. If the metastases are then confirmed by other tests, the treatment options would be limited to hormonal therapy or chemotherapy.

PSA tests also should be done periodically after treatment to help assess the results of treatment. For example, an increasing PSA suggests growth or spread of the cancer, despite the treatment. In contrast, a decreasing PSA indicates improvement. As a matter of fact, a post-treatment PSA of zero may indicate complete control or cure of the cancerur

Surgical Treatment for Prostate Cancer

The surgical treatment for prostate cancer is commonly referred to as a radical or total prostatectomy, which is the removal of the entire prostate gland. This gives a 90% cure rate when the disease is confined to the prostate and the entire gland is removed. The potential complications of a radical prostatectomy include the risks of anesthesia, local bleeding, impotence (loss of sexual function) in 30%-

70% of patients, and incontinence (loss of control of urination) in 3%-10% of patients.

Great strides have been made in lowering the frequency of the complications of radical prostatectomy. These advances have been accomplished largely through improved anesthesia and surgical techniques. The improved surgical techniques, in turn, stem from a better understanding of the key anatomy and physiology of sexual potency and urinary continence. Specifically, the recent introduction of nerve-sparing techniques for the prostatectomy has helped to reduce the frequency of impotence and incontinence.

If post-treatment impotence does occur, it can be treated by sildenafil (Viagra) tablets, injections of such medications as alprostadil (Caverject) into the penis, various devices to pump up or stiffen the penis, or a penile prosthesis (an artificial penis). Incontinence after treatment often improves with time, special exercises, and medications to improve the control of urination. Occasionally, however, incontinence requires implanting an artificial sphincter around the urethra. The artificial sphincter is made up of muscle or other material and is designed to control the flow of urine through the urethra.

Radiation Therapy for Prostate Cancer

The goal of radiation therapy is to damage the cancer cells and stop their growth or kill them. This works because the rapidly dividing (reproducing) cancer cells are more vulnerable to destruction by the radiation than are the neighboring normal cells. Clinical trials have been conducted using radiation therapy for patients with organ-confined (localized) prostate cancer. These trials have shown that radiation therapy resulted in a rate of survival (being alive) at 10 years after treatment that is comparable to that for radical prostatectomy. Incontinence and impotence can occur as complications of radiation therapy, as with surgery, although perhaps less often than with surgery. More data are needed, however, on the risks and benefits of radiation therapy beyond 10 years, especially because late recurrences (reappearances) of the cancer can sometimes occur after radiation.

Choosing between radiation and surgery to treat organ-confined prostate cancer involves considerations of the patient's preference, age, and co-existing medical conditions (fitness for surgery), as well as of the extent of the cancer. Approximately 30% of patients with organ-confined prostate cancer are treated with radiation. Sometimes, oncologists combine radiation therapy with surgery or hormonal therapy in efforts to improve the long-term results of treatment in the early or later stages of prostate cancer.

Radiation therapy can be given either as external beam radiation over perhaps 6 or 7 weeks or as an implant of radioactive seeds (brachytherapy) directly into the prostate. In external beam radiation, high energy x-rays are aimed at the tumor and the area immediately surrounding it. In brachytherapy, radioactive seeds are inserted through needles into the prostate gland under the guidance of transrectally taken ultrasound pictures. *Brachy*, from the Greek language, means short. The term brachytherapy thus refers to placing the treatment (radiation therapy) directly into or a short distance away from the cancerous target tissue. The theoretical advantage of brachytherapy over external beam radiation is that delivering the radiation energy directly into the prostate tissue should minimize damage to the surrounding tissues and organs. The actual advantages or disadvantages of brachytherapy as compared to external beam radiation, however, are still being studied.

Hormonal Treatment for Prostate Cancer

The male (androgenic) hormone is called testosterone. It stimulates the growth of cancerous prostatic cells and, therefore, is the primary fuel for the growth of prostate cancer. The idea of all of the hormonal treatments (medical and surgical), in short, is to decrease the stimulation by testosterone of the cancerous prostatic cells. Testosterone normally is produced by the testes in

response to stimulation from a hormonal signal called LH-RH. The LH-RH stands for luteinizing hormone-releasing hormone and is also called gonadotropin-releasing hormone. This hormone comes from a control station in the brain and travels in the blood stream to the testes. Once there, the LH-RH stimulates the testes to produce and release testosterone.

Hormonal treatment, also referred to as androgenic deprivation (depriving the prostate of testosterone), can be accomplished surgically or medically. The surgical hormonal treatment is removal of the testes in an operation called an orchiectomy or a castration. This surgery thus removes the body's source of testosterone. The medical hormonal treatment involves taking one or two types of medication. One type is referred to as the LH-RH agonists. They work by competing with the body's own LH-RH. These drugs thereby inhibit (block) the release of LH-RH from the brain. The other type of drug is referred to as anti-androgenic, meaning that these drugs work against the male hormone. That is, they work by blocking the effect of testosterone itself on the prostate.

Today, most men electing hormonal treatment choose medication over surgery, probably because they view surgical castration as more devastating cosmetically or psychologically. Actually, however, the effectiveness and side effects of medical hormonal treatment as compared

to surgical hormonal treatment are very much the same. Both types of hormonal treatment usually effectively eliminate stimulation of the cancer cells by testosterone. Some tumors of the prostate, however, do not respond to this form of treatment. They are referred to as androgen-independent prostate cancers. The principal side effects of all of these hormonal treatments (that is, the side effects of androgenic deprivation) are enlarged breasts (gynecomastia) that often are tender, flushing (like hot flashes), and impotence.

The LH-RH agonists, leuprolide (Lupron) or goserelin (Zoladex), are given as monthly injections in the doctor's office. The anti-androgenic drugs, flutamide (Eulexin) or bicalutamide (Casodex), are oral capsules that are used usually in combination with the LH-RH agonists. The LH-RH agonists are often effective alone. The anti-androgenic drugs are added, however, if the cancer progresses despite the use of the LH-RH agonists. The hormonal treatments may have value, as well, when combined with radiation therapy. Studies are currently being conducted to determine if hormonal therapy enhances the therapeutic effect of radiation.

Generally, hormonal treatment is reserved for individuals who have advanced prostate cancer with local spread or metastases. Occasionally, an individual with organ-confined (localized) prostate cancer will receive hormonal

treatment because he has severe associated medical problems or simply because he refuses to undergo surgery or radiation. Hormonal treatment is used in less than 10% of men with organ-confined (localized) prostate cancer. Remember that the intent of hormonal therapy usually is palliative. This means that the goal is to control the cancer rather than cure it because a cure is not possible.

Cryotherapy for Prostate Cancer

Cryotherapy is one of the newer treatments that is being evaluated for use in the early stage of prostate cancer. This treatment kills the cancer cells by freezing them. The freezing is accomplished by inserting a freezing liquid (for example, liquid nitrogen or argon) through needles directly into the prostate gland. The procedure is accomplished under the guidance of ultrasound images.

At present, cryotherapy is recommended for patients with locally advanced prostate cancer who, for whatever reason, are not candidates for the more established treatments. The effectiveness of cryotherapy in eliminating prostate cancer, however, has not yet been proven. Sometimes the freezing liquid fails to kill all of the cancer cells. Moreover, the potential side effects of this treatment include damage to the urethra and bladder. This damage can cause obstruction (blockage) of the

urethra, fistulas (abnormal tunnels) that leak urine, or serious infections.

Chemotherapy for Prostate Cancer

Chemotherapeutic agents, or chemotherapy, are anti-cancer drugs. They are used (for hormone resistant prostate cancer) as a palliative treatment (palliation to relieve symptoms) in patients with advanced cancer for whom a cure is unattainable. Recall that the goal of palliation is simply to slow the tumor's growth and relieve the patient's symptoms. Chemotherapy is not ordinarily used for organ-confined or locally advanced prostate cancers because a cure in these cases is possible with other treatments. Currently, chemotherapy is used only for advanced metastatic prostate cancers that have failed to respond to other treatments.

Examples of chemotherapeutic agents for prostate cancer are estramustine (Emcyt), and mitoxantrone (Novantrone) in combination with prednisone for palliating androgen-independent prostate cancer. Metastatic tumors that have not responded specifically to hormonal therapy are referred to as androgen-independent (hormone-refractory) prostate cancers.

The more common side effects of chemotherapy include weakness, nausea, hair loss, and suppression of the bone

marrow. The suppression of marrow, in turn, can decrease the red blood cells (causing anemia), the white blood cells (leading to infections), and the platelets (resulting in bleeding).

New chemotherapeutic agents for prostate cancer are continually being studied for their effectiveness and safety in cancer centers globally.

Herbal or Other Alternative Treatments for Prostate Cancer

Alternative medicine, also called integrative or complementary medicine, includes such non-traditional treatments as herbs, dietary supplements, and acupuncture. A major problem with most herbal treatments is that their composition is not standardized. Moreover, the way herbal treatments work and their long-term side effects usually are not known.

Watchful Waiting

Watchful waiting is observing a patient while no treatment is given. Such a patient usually has an organ-confined tumour and no symptoms. Understand, however, that although watchful waiting involves no actual treatment, the patient still needs close follow-up and monitoring. The follow-up involves frequent visits to the doctor, perhaps every three to six months. The visits include questions

about new or worsening symptoms and digital rectal examinations for any change in the prostate gland. In addition, blood tests are done to watch for a rising PSA and imaging studies can be conducted to detect the spread of the cancer. If the history, examinations, or any of the tests signal the possibility of an advancing cancer, the watchful waiting usually is discontinued and treatment is recommended.

This option of watchful waiting actually has been chosen over a therapeutic intervention, such as surgery or radiation, in up to 30% of patients who have organ-confined (localized) prostate cancer. The main reason for taking a course of watchful waiting is that prostate cancers generally grow more slowly than most other cancers. Thus, many localized prostate cancers found at an early stage can take years or sometimes even decades to spread locally and metastasize. Therefore, watchful waiting seems to make sense for organ-confined (localized) prostate cancers in men who are elderly. It is also a reasonable decision in men who have tiny (seen only with a microscope) tumors and a low PSA (for example, in the 4-10 range or lower). Additionally, watchful waiting often is the most appropriate choice in men who are ill with other serious medical diseases, such as heart or lung disease, poorly controlled high blood pressure, diabetes, AIDS, or other cancers.

Watchful waiting in prostate cancer, however, remains controversial.

Prevention of Prostate Cancer

No specific measures are known to prevent the development of prostate cancer. At present, therefore, we can hope only to prevent progression of the cancer by making early diagnoses and then attempting to cure the disease. Early diagnoses can be made by screening men for prostate cancer. Screening is done, as mentioned previously, by routine yearly digital rectal examinations beginning at age 40 and the addition of an annual PSA test beginning at age 50. The purpose of the screening is to detect early, tiny, or even microscopic cancers that are confined to the prostate gland. Early treatment of these malignancies (cancers) can stop the growth, prevent the spread, and possibly cure the cancer.

Based on some research in animals and people, certain dietary measures have been suggested to prevent the progression of prostate cancer. For example, low fat diets, particularly avoiding red meats, have been suggested because they are thought to slow down the growth of prostate tumours in a manner not yet known. Soybean products, which work by decreasing the amount of testosterone circulating in the blood, also reportedly can inhibit the growth of prostate tumours. Finally, other

studies show that tomato products (lycopenes), the mineral selenium, and vitamin E might slow the growth of prostate tumours in ways that are not yet understood.

Future Treatments for Prostate Cancer

Investigators at research centres have focused on identifying and isolating the gene or genes responsible for prostate cancer. For example, studies are being conducted in men who have a family history of prostate cancer to try to uncover the genetic links of the disease. The investigators ultimately will try to block or modify the offending genes so as to prevent or alter the disease. Finally, perhaps a vaccine to either prevent or treat prostate cancer will be developed in the future.

A Quick Look at Prostate Cancer

- Globally, prostate cancer is the third most common cause of death from cancer in men of all ages and is the most common cause of death from cancer in men over age 75. Prostate cancer is rarely found in men younger than 40.

- While the causes of prostate cancer are still unknown, some risk factors for the disease, such as advancing age and a family history of prostate cancer, have been identified.

- Prostate cancer is often initially suspected because of an abnormal PSA blood test or a hard nodule (lump) felt on the prostate gland during a routine digital (done with a finger) rectal examination.

- The digital rectal examination (starting at age 40) and the PSA blood test (starting at age 50) should be done at yearly intervals to screen men for prostate cancer.

- Refinements in the PSA test, including the age-specific PSA, have improved the accuracy of the test.

- If one of the screening tests is abnormal, the diagnosis of prostate cancer should be suspected and a biopsy of the prostate gland is usually done.

- The diagnosis of prostate cancer is made when cancerous prostatic cells are identified in the biopsy tissue under a microscope.

- In some men, prostate cancer is life threatening, while in many others, it can exist for many years without causing health problems.

- The choice of treatment for prostate cancer depends on the size, aggressiveness, and extent or

spread of the tumor, as well as on the age, general health, and preference of the patient.

- The many options for treating prostate cancer include surgery, radiation therapy, hormonal treatment, cryotherapy, chemotherapy, combinations of some of these treatments, and watchful waiting.

- Research is underway to identify the genes that cause prostate cancer.

OSTEOARTHRITIS

Osteoarthritis is a disease that is caused by normal wear and tear on joints as well as trauma to a joint or joints. As time goes on constant use of a joint causes wear on the cartilage inside the joint. The purpose of the cartilage inside the joint is to provide shock absorption and a smooth surface for the joint to move on. As the osteoarthritis causes the cartilage to break down, the surface inside the joints becomes rough which causes bone damage and inflammation. Inflammation causes cartilage and bone further damaged as the bones rub together.

Osteoarthritis is a degenerative disease whose symptoms increase with age. It develops as we age because of the damage that slowly happens over time to joints. Although the prevalence of osteoarthritis of the hip in Nigerian men, as recorded in a hospital based study in Maiduguri, is

somewhat lower than that of men of similar age in Britain (7.0% as against 13.2%), the problem is definitely on the increase and calls for public concern. The condition affects both men and women and occurs primarily in individuals over 40 years of age. Trauma to a joint is the main cause of osteoarthritis for people under the age of 40.

Osteoarthritis most frequently occurs in the knees, hips, ankles, hands and other weight bearing joints. This is because there is more stress put on these joints which cause more wear than with non weight bearing joints.

Causes of Osteoarthritis

For most people, the cause of osteoarthritis is unknown, but metabolic, genetic (family history), chemical, and mechanical factors play a role in its development. It is associated with the aging process and is the most common form of arthritis.

It may first appear without symptoms between 30 and 40 years of age and is present in almost everyone by the age of 70. Symptoms generally appear in middle age. Before the age of 55 it occurs equally in both sexes. Thereafter the incidence becomes higher in women. The cartilage of the affected joint becomes roughened and worn down as the disease progresses. The bones rub together and bony spurs develop around the joint. Joints that are commonly affected are those of the hands and fingers, hips, knees, big toe, and cervical and lumbar spine.

The degeneration of the joint may begin as a result of trauma to the joint, occupational overuse, obesity, or mal-alignment of the joints (for example being bow-legged or knock-kneed).

Until the late 1980s, osteoarthritis was regarded as an inevitable part of aging, caused by simple "wear and tear" on the joints. This view has been replaced by recent research into cartilage formation. Osteoarthritis is now considered to be the end result of several different factors contributing to cartilage damage, and is classified as either primary or secondary.

Primary Osteoarthritis

Primary osteoarthritis results from abnormal stresses on weight-bearing joints or normal stresses operating on weakened joints. Primary osteoarthritis most frequently affects the finger joints, the hips and knees, the cervical and lumbar spine, and the big toe. The enlargements of the finger joints that occur in osteoarthritis are referred to as Heberden's and Bouchard's nodes. Some gene mutations appear to be associated with osteoarthritis. Obesity also increases the pressure on the weight-bearing joints of the body. Finally, as the body ages, there is a reduction in the ability of cartilage to repair itself. In addition to these factors, some researchers have theorized that primary osteoarthritis may be triggered by enzyme disturbances, bone disease, or liver dysfunction.

Secondary Osteoarthritis

Secondary osteoarthritis results from chronic or sudden injury to a joint. It can occur in any joint. Secondary osteoarthritis is associated with the following factors:

- Trauma, including sports injuries
- Repetitive stress injuries associated with certain occupations (like the performing arts, construction or assembly line work, computer keyboard operation, etc.)
- Repeated episodes of gout or septic arthritis
- Poor posture or bone alignment caused by developmental abnormalities
- Metabolic disorders.

Symptoms of Osteoarthritis

Symptoms vary from person to person even though each person suffering from osteoarthritis has joint deterioration. It is usually thought of as a progressive disease, one that gets worse over time. Some people find the condition incapacitating while others have very few symptoms. Pain, the primary symptom of the disease, is commonly brought on through activity; however, it could be present even when the body is at rest. Examples of osteoarthritis symptoms include:

- Loss of movement
- Stiffness and swelling in the joints
- Snapping of the joints

- Bony growths at the joints and abnormal angulation.

For the knee, the actual appearance may change over time. Some people may become knock-kneed or bow-legged. Muscles surrounding the joint may become weaker and sometimes shrink as a result of lack of movement.

The pain of osteoarthritis of the hip may cause the patient to limp. Pain may also be felt around the groin or inner thigh. The affected leg may appear shorter in cases of osteoarthritis of the hip. Putting on shoes and tying the laces become difficult.

In osteoarthritis of the fingers, the breakdown of cartilage causes bone spurs in the joints. Spurs in the end joints of fingers are called Heberden's nodes, which occur most often in women and sometimes as early as 40. Spurs in the middle joints of the fingers are called Bouchard's nodes.

Regardless of the type of arthritis that a person has, many patients will experience some difficulty functioning at home, at work or at play because of joint pain, stiffness, and loss of motion. Arising from bed in the morning, buttoning buttons, writing, sewing, meal preparation, dressing, sleeping, walking, climbing stairs, arising from a chair or a toilet seat, and attending to matters of personal hygiene may all be impaired to some degree by arthritis. Oftentimes, impairment of function is more distressing to patients than the pain of arthritis and a major goal of all

arthritis treatment is the preservation or improvement of function.

Investigations

After taking a good history of the presenting complaints, the doctor will determine the type of arthritis the patient has. A careful examination of the joints will then be performed to determine if there is any swelling, redness, tenderness or loss of motion. X-rays will be done to visualize the inside of the joints and determine if there has been any destruction of cartilage with narrowing of the normal joint space or wear and tear on the bones. Blood tests may also be of value in differentiating rheumatoid arthritis from osteoarthritis and other types of arthritis.

Prevention of Osteoarthritis

Osteoarthritis results from deterioration or loss of the cartilage that acts as a protective cushion between bones, particularly in weight-bearing joints such as the knees and hips. While it is not totally preventable, there are three things one can do to limit the chances and mostly limit the severity if osteoarthritis is developed.

Weight Control

Since excess weight adds unnecessary strain on joints, maintaining a healthy and appropriate weight may be the single most important thing that can be done to prevent osteoarthritis. Being overweight puts extra strain on the joints, particularly the large weight-bearing joints such as

the knees, the hips, and the balls of the feet. Extra weight may alter the normal structure of the joint and increase the risk for osteoarthritis.

Injury Prevention

One of the major causes of osteoarthritis is injury or trauma to a joint or group of joints. Protecting the joints from serious injury or repeated minor injuries will decrease the risk of damaging cartilage. Repeated minor injuries include job-related injuries such as frequent or constant kneeling, squatting, or other postures that place stress on the knee joint. Wearing protective gear when engaged in sports and not playing through an injury may also help prevent osteoarthritis.

Exercise

Exercise can help reduce joint pain and stiffness. Light- to moderate-intensity physical activity may prevent a decline in, and may even restore, health and function. However, some people with osteoarthritis may be reluctant to exercise because of joint pain after activity. Various steps can be taken to help relieve pain, such as heat and cold therapy or taking pain relievers, which may make it easier to exercise and stay active. Partial or non-weight bearing exercise, such as bicycling, swimming, or water exercise may be done.

Osteoarthritis Prevention – Ten Ways to Protect Your Joints

1. Maintain your ideal body weight. The more you weigh, the more stress you are putting on your joints, especially your hips, knees, back and feet.
2. Move your body. Exercise protects joints by strengthening the muscles around them. Strong muscles keep your joints from rubbing against one another, wearing down cartilage.
3. Stand up straight. Good posture protects the joints in your neck, back, hips and knees.
4. Use the big joints. When lifting or carrying, use largest and strongest joints and muscles. This will help you avoid injury and strain on your smaller joints.
5. Pace yourself. Alternate periods of heavy activity with periods of rest. Repetitive stress on joints for long periods of time can accelerate the wear and tear that causes osteoarthritis.
6. Listen to your body. If you are in pain, don't ignore it. Pain after activity or exercise can be an indication that you have overstressed your joints.
7. Don't be static. Changing positions regularly will decrease the stiffness in your muscles and joints.
8. Forget the weekend warrior. Don't engage in activities for which your body isn't prepared. Start new activities slowly and safely until you know how your body will react to them. This will reduce the chance of injury.

9. Wear proper safety equipment. Don't leave helmets and wrist pads at home. Make sure you get safety gear that is comfortable and fits appropriately.
10. Ask for help. Don't try to do a job that is too big for you to handle. Get another pair of hands to help out.

Treatment of Osteoarthritis

Patients with mild OA may be treated only with pain relievers such as acetaminophen (Tylenol) or propoxyphene (Darvon). Most patients with osteoarthritis, however, are given non-steroidal anti-inflammatory drugs, or NSAIDs. These include compounds such as ibuprofen (Motrin, Advil), and ketoprofen (Orudis). The NSAIDs have the advantage of relieving inflammation as well as pain. They also have potentially dangerous side effects, including stomach ulcers, sensitivity to sun exposure, kidney disturbances, and nervousness, depression or death.

COX-2 inhibitors are the new generation of NSAIDS (non-steriodal anti-inflammatory drugs). These medications target only the COX-2 enzyme that stimulates the inflammatory response. They are much safer than aspirin, ibuprofen and other NSAIDs. These drugs do not cause the type of stomach and intestinal bleeding and are safer on the kidneys and liver. Their side effects include abdominal pain, nausea, and indigestion. The most popular C-2 inhibitors are Viox and Celebrex.

Corticosteroids are the most potent anti-inflammatory agent; however they have negative effects in the long-term. A good drug is prednisone, but it is seldom used because it has long-term side effects, which scare both physicians and patients. These medications are useful in reducing the whole-body disease with symptoms such as fever, anemia, weight loss, neuropathy and vasculitis (blood vessel inflammation).

Osteoporosis is one of the most feared long-term effects of steroid use. If the dose of prednisone is more than 7.5 mg per day over six months, a bone scan should be done. If bone density is decreased, treatment with etidronate and calcium may prevent bone loss and permit the continued use of steroid therapy. Prednisone is the preferred agent because it is cheap and effective.

Prednisone is often a magic drug that relieves terrible pain and suffering often in the first 48-72 hours of therapy. The problems with prednisone arise with long-term use. The secret of success is to use this drug for brief periods and attempt to control the disease with diet revision in the long-term. A medium to high dose of prednisone (20 - 60 mg per day) may be required for several days and then is reduced to an effective short-term maintenance level between 5 and 20 mg/day.

Steroids, which are injected directly into the joint, may also be used to reduce inflammation and pain. Injecting steroids into one or two local areas of inflammation allows doctors to deliver a high dose of medication directly to the problem area. When doctors give steroids by mouth or

intravenously, they cannot be sure an adequate amount of the steroid will eventually reach the problem area.

The recent development of an "artificial joint fluid" which can be injected directly into the knee has helped many patients who were not able to take medications. The two medications now available for patients are called Synvisc and Hyalgan. In a recent medical study Hyalgan, a naturally occurring sugar, has been shown to significantly reduce the pain of osteoarthritis of the knee when compared to oral medications.

The first treatment for early stages of osteoarthritis of the hip may be:

- Rest your hip from overuse.
- Follow a physical therapy program of gentle, regular exercise like swimming, water aerobics or cycling to keep your joint functioning and improve its strength and range of motion.
- Use non-steroidal anti-inflammatory medications like ibuprofen for pain.
- Get enough sleep each night.

You may need to lose weight if you are overweight. As the disease progresses, you may need to use a cane.

Surgery may help if osteoarthritis is severe. In that case, the hip joint hurts when at rest in the night and/or the hip is severely deformed. Total hip replacement surgery (arthroplasty) may be recommended. A two-piece ball and

socket replacement for the hip joint is done. This usually relieves the pain and improves the ability to walk.

CONCLUSIONS

The experience of high-income countries indicates that non-communicable diseases can be prevented and managed with declines in death and disability. This "postindustrial" epidemiologic transition is based on the development and application of scientific information. Risk factors predict disease and their modification through public health and personal health measures can change disease patterns in individuals, groups, and populations. Technological development can assist this change through the development of vaccines, medicines, and foods. However, personal behaviors and public health policies will always be important. These innovations can be transported throughout Nigeria and other sub-Saharan African countries. They require substantial financial commitment on the part of the government and the non-governmental organizations, as well as the need to assure cultural integrity. Cost, education, and cultural diversity will be barriers to be surmounted as the programmes are implemented. Further investigations of risk worldwide will include appreciation of gene-environment interactions and exploration of new exposures. The improvement of health for all will depend on this progress.

In Nigeria today, hardly a day passes without one hearing of a death caused by one or the other non-communicable disease. Yet our government has not placed this group of diseases on its priority list of health issues. Government failure in formulating a national policy to arrest the increasing number of untimely deaths from non-communicable diseases is to say the least most disappointing. In fact, the government is not the only culprit. The general indifference surrounding these diseases is scandalous. These are diseases that kill thousands of Nigerians and equally affect millions of others, yet no sign of institutional support of any kind is in place to tame the scourge. The grim picture of insufficient resources and a lack of basic infrastructure mean that most Nigerians have no access to disease screening, early diagnosis, treatment or palliative care in the case of cancers. They are basically on their own with the burden of care resting largely on relatives, often with poor resources.

It is pertinent to note that non-communicable diseases can be controlled with prevention and treatment when the modifiable environmental causes and personal habits are identified and controlled, and effective health services made available to the public. Further research studies can identify the risks and the means to modify them. This information can be applied to individuals and groups to

improve health and to stall the anticipated epidemic of non-communicable diseases.

There is an urgent need to imbibe the United Nations resolution that draws attention for action on non-communicable diseases. Prior to that, non-communicable diseases have not received the level of attention, coordination, or funding that indicates their high mortality rate or socioeconomic effect. The resolution calls for the global community to develop coherent country policies for the prevention and control of these diseases, which account for 60% of all deaths globally. it is recognized that preventive measures are largely in the domain of policy. Tackling the important determinants such as improving education and reducing poverty, eliminating tobacco use in any form, promoting culturally appropriate healthy diets in populations and facilitating population-level increases in physical activity are within the purview of our policy makers. Apart from establishing a comprehensive national policy, there is also a need to accelerate the development of national indicators, targets for tracking progress and financing mechanisms to drive the system. It is hoped that Nigeria will not be left behind in this noble venture.

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