An-Najah National University
Faculty of Graduate Studies

The Major Risk Factors of Cerebral Stroke in Patients Admitted to the Hospitals of North West Bank Districts

By

Ahmed Juma Ibrahim Ali

Supervised By

Dr. Suleiman Al- Khalil *Dr. Mathhar Darwazeh*

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ENDORSEMENT

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Ahmad Jum'a Ibrahim Ali

This Thesis Was Successfully Reddened and Approved on 26th March, 2002 by

Committee Members : *Signature*

1. Dr. Suleiman Al- Khaleel (Supervisor) S.S.Alkhalil

2. Dr. Mathhar Darwaza (Co-Supervisor)

3. Dr. Yahya Fadi (Internal Examiner) Y. Fadi

4. Dr. Tawfiq Rahal (External Examiner)

Dedication

To everyone of my family, with great love.

Ahmed

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List of Tables

Abbreviations

CVA: Cerebro vascular accident

DM: Diabetes mellitus

TIA: Transient ischemic attack

AF: Atrial fibrillation.

WHO: World Health Organization

CT scan: Computer tomography.

MRI: Magnetic resonance image

HTN: Hypertension

SPSS: Statestic packages of social science

U.S.A: United States of America

LDL: Low density lipoprotein

HDL: High density lipoprotein

MOH: Ministry of health

Abstract

The major risk factors of cerebral stroke inpatients admitted to the hospitals of North West Bank districts.

A retrospective study was aimed at assess the major risk factors of cerebral stroke in the North West Bank districts hospitals. The study included 522 cases of cerebral stroke that were admitted to the hospitals, during the year1/1/2000 to 31/12/2000.

Data collected from the medical records about risk factors, labratory tests, brain CT reports, family history, and drugs before admission and smoking. The patients were classified into ischemic stroke, hemorrhagic stroke, and no apparent lesion and not available (not done or not found). The outcomes of cerebral stroke were by using discharge report.

The study results showed that the most common risk factors of cerebral stroke were hypertension, previous stroke, diabetes mellitus, a trial fibrillation, myocardial infarction and transient ischemic attack. Other risk factors include family history and increase blood level sugar, platelets, cholesterol and packed cell volume.

The study recommends further studies, on primary prevention of risk factors and medical follow up.

Chapter one

Introduction

Introduction

Stroke is defined as rapidly developing clinical signs of focal and at times global (applied to patients in deep coma and to those with sub-arachnoids hemorrhage) loss of cerebral function, with symptoms lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin (1). Cerebral stroke is the third leading cause of death in the United States and developed countries, after coronary heart disease and cancer. Many survivors are left with mental and physical impairment and require assistance with activities of daily living. There is currently no effective treatment for many forms of stroke. Hence, primary prevention offers the greatest potential for reducing the burden of this disease (2).

Stroke is a major health problem because of its impact on communities ' costs and facilities. In the United States, the total annual cost of stroke was about $50 billion, distributed on rehabilitation, treatment, equipment and loss of patients' productivity (3).

Since 1955 there has been a major progress in the understanding of the pathophysiology of cerebrovascular diseases, identification of the types, risk factors and treatment of the cerebrovascular diseases. Leading specialists in stroke participated with World Health Organization in the developing methods for collecting reliable information on the magnitude and nature of the stroke in the communities, as a basis for planning future services to prevent, treat and rehabilitate stroke patients. Following this recommendation, WHO has developed a stroke register approach and stroke risk profile, in order to

predict the individual's probability of stroke and planning preventive measures, diagnostic procedures and rehabilitation policies applied to the stroke patients. The philosophy behind WHO risk profile is something for all. The risk factors, natural history and incidence rate of cerebral stroke has been studied in different epidemiological studies in different countries (4). Stroke register and a risk profile being used by each country affect these. In Japan, the age adjusted stroke incidence was 2.4/1000, while in Hawaii, the age adjusted stroke incidence was 2.7/1000. This difference is attributable to variations in local diagnostic habits, availability of diagnostic facilities, age structure, environmental factors, and type of cerebral stroke (5).

Because cerebral stroke continues to have a great burden on public health in the world, it is necessary to identify the risk factors and modify them. Therefore, a wide agreement has been achieved in prevention of cerebral stroke through successful treatment of hypertension, atrial fibrillation, diabetes mellitus, hypercholesterolemia and blood diseases, and modification of certain personal habits as cigarette smoking and alcohol consumption (2).

Symptoms of stroke:

The national institute of neurological disorders and stroke list the following symptoms of stroke:

1-Sudden numbness or weakness in the face, arm, or leg or togather, particularly on one side of the body.

2-Sudden confusion or trouble speaking, un understanding speech.

3-Sudden vision loss or trouble seeing in one or both eyes.

4-Sudden trouble walking, or dizziness, loss of balance, or loss of coordination.

5-Sudden severs headache for no apparent reason.

6-Other symptoms may include trouble swallowing, vomiting, irregular breathing, and sudden deviation of the eyes in one direction, double vision, or loss of consciousness (6).

Who is at risk?

Anyone can have a stroke. It happens to men and women of all ages, and races. Strokes are rare in children, but they do occur, even in fetuses (children are most likely to have hemorrhagic strokes). However, like other medical conditions, age is a significant risk factor; two thirds of strokes are in people older than 65 years and after the age of 55, the risk of stroke doubles each decade. Men have a slightly higher chance of having a stroke than women have, but women are likely to die of stroke, this may be because women live longer than men do, in general. Some genetic factors may also be involved; strokes are known to run in some families, and some of the conditions that predispose a person to strokes, for example, diabetes and hypertension (6).

Significance of the problem:

Stroke is the commonest cause of severe disability in the community, and its patients are estimated to consume about 5% of all health resources (7).

Accurate information about incidence, management, and outcome should therefore be available to those responsible for planning in the health and social services and to clinicians concerned with the treatment and prevention of cerebro- vascular disorders.

In Palestine, a significant proportion of cerebral stroke patients and possible risk factors are still unpredictable. Therefore, investigation of cerebral stroke frequency and determinants is important. It is expected that the findings of this study may result in a better identification of risk factors and frequency of cerebral stroke to reduce its incidence and improve its outcome.

Objectives of the study:

1. Identifying the frequency of cerebral stroke cases that were admitted to the hospitals of North West Bank.
2. Assessing the major risk factors that might be associated with cerebral stroke affecting its frequency and outcome.
3. Recognizing the size of the problem in the Palestinian society.
4. Identifying types of stroke, and reducing medical and health care costs and to give Palestinian the knowledge they need.

The risk factors include:

1) Individual's characteristics, which include age and sex.
2) Previous medical problems, which include hypertension, cardiac disease, diabetes mellitus, transient ischemic attacks (TIA) and previous cerebral strokes.
3) Individual's habits, which include cigarette smoking, and oral contraceptives, and heavy drinking alcohol.
4) Blood bio-chemicals alterations of the packed cell volume, serum cholesterol, platelets and blood sugar levels.
5) Lifestyle factors such as obesity and physical inactivity increases the risk of stroke. Some studies have linked increased stroke risk to lower income, educational level and stress (6).

Chapter Two

Stroke Status

Stroke Status

A. Stroke in the Arab world:

In Syria, of the 1957 patients registered in the Neurology Department of Damascus Hospital since 1/1/1990, there were 1332 males and 625 females (age ranges between 12 and 79 years). The types of stroke were ischemic (66.4%), hemorrhagic (27.7%) and T.I.A. (5.8%), the main associated factors were hypertension (71%), diabetes mellitus (30%), cardiac disorder (33%), previous stroke (8%) (13).

In Lebanon, for two years starting from January 1995, all stroke cases were treated at two University Hospitals, (Hotel Dieu de France, and American University of Beirut Medical Center). They found that 1% of the total patients admitted suffered a stroke (13).

The incidence rate of stroke is about 125/100,000 / year. The relative incidence of the different types of strokes was ischemic stroke in 59 %, sub arachnoid hemorrhages in 26%, and intra hemorrhagic strokes in 15% of cases (13).

In Egypt, in a multi central study, prevelance of stroke has been found to be 4.6/1000 in urban areas, 5.6/1000 in rural areas and 6.4/1000 in suburban areas with a mean of 4.5/1000. The annual incidence was 2.1/1000/year. Ischemia constituted 78% and hemorrhage 22% of all strokes. Hospital admission for cerebral ischemia has winter- spring peak. However, hemorrhage peaks during summer (13).

In Jordan, a study carried out by khashim, R. during a two years period (June 1st 1994 to May 31st 1996) for cerebral stroke cases admitted to Prince Basma Hospital in Irbid, the study result showed that the admission rate was 81.9 /1000 cases. The most common risk factors of cerebral stroke were diabetes mellitus, hypertension, atrial fibrillation, and myocardial infarction, previous history of stroke, transient ischemic attack and alterations of some blood biochemical levels (8).

In Palestine, deaths of age 5 and over from cerebrovascular disease were 791 cases during 1998 (9). And in males, during 1999 there were 66 cases (6.8%), and from females, during the same year, there were 73 cases (10.6%) (10). Amro, A. did another case control study in Hebron City. The study included 80 subjects who were inhibitants of Hebron. These were divided into two groups, the experimental group (40 cases), and the control groups (40 cases). Current hypertension, history of cardiac problems, regular consumption of fatty diet, and inadequate regular sports or physical activities, was confirmed as significant risk factors of stroke (11).

B. Stroke in the world:

In Greece, the official statistics of the Ministry of Health of 1995 showed 28,000 patients with cerebro vascular disease were hospitalized. Unpublished data from two registries showed 82.5% of strokes are ischemic infarction, 15% are intrahemorrhagic stroke and 2.5% are subarchnoid hemorrhage (13).

In Finland, mortality from stroke in three geographical areas from 1983 to 1986 was between 73 and 90 /100,000 /year among men aged 25 to 74 years, and between 42 and 55 / 100,000 / year among women in the same age group (12).

In U.S.A, stroke killed 159,791 people in 1997, and it is the third largest cause of death ranking behind diseases of the heart and all forms of cancers. Stroke is a leading cause of serious, long-term disability; about 4,400,000 stroke survivors are alive today. About 500,000 of these are first attacks and 100,000 are recurrent attacks. The 1997 death rates / 100,000 populations for stroke were 61.5 for white males and 88.5 for black males, and 57.9 for white females and 76.1 for black females (1).

In Spain, stroke incidence is estimated around 200 / 100,000 inhabitants/year, the most frequent etiological causes of ischemic stroke are cardio embolism 26 %, large vessel atherosclerosis 11%, small vessel athero - sclerosis 30%, other causes 6%, and under terminated 27%(13).

Types of stroke:

1. Ischemic: the most common cause of stroke is due to obstruction to one of the major cerebral arteries, and this cuts off the brain blood supply.
2. Hemorrhagic: it is caused from the bleeding of the blood vessels into the deeper parts of the brain.
3. Transient ischemic attack (TIA): it refers to a stroke like syndrome in which recovery is complete within 24-hrs (14).

Pathophysiology

Cerebral infarction basically comprises two pathophysiologic processes:

1- A loss in the supply of oxygen and glucose secondary to vascular occlusion.

2- An array of changes in cellular metabolism consequent upon the collapse of energy producing processes, with disintegration of cell membranes (15). Arterial supply of the brain is derived from the internal carotid arteries and vertebral arteries. The total blood flow in a normal person is about 750 ml / minute. However, that amount is maintained by auto regulatory mechanism through changes in carbon dioxide and oxygen concentrations. Impairment in the cerebral circulation leads to stroke through two pathological ways:

A - Cerebral ischemia is caused by a reduction in blood flow that lasts for several seconds or few minutes. If the cessation of flow lasts for more than few minutes, infarction of the brain tissue results.

A generalized reduction in cerebral blood flow, mainly due to cardiac arrhythmias, myocardial infarction, or hemorrhagic shock usually produces syncope. While focal ischemia or infarction is usually caused by diseases in the cerebral vessels or by emboli from the heart, the majority of infarcts are the result of cerebral atherosclerosis or cardiogenic emboli. Ischemia and infarction constitute 85% to 90% of the total group.

B - Hemorrhagic stroke may occur into the brain parenchyma, the subarachnoid space or the subdural or epidural space. Subdural and epidural hematomas are usually the result of trauma; therefore, they are not

cerebrovascular diseases. The majority of intrahemorrhagic stroke cases are associated with hypertension, spontaneous hemorrhage or arteriovenous malformation, while spontaneous subarachnoid hemorrhage is usually due to cerebral aneurysm or, less commonly, an arteriovenous malformation, intracranial hemorrhage constitutes 10% to 15% of the total group (16)(17).

Mortality / Morbidity

Stroke is the third leading cause of death and the leading cause of disability in the United States (18). Cerebral- vascular disease was the second leading cause of death world wide in 1990, killing over 4.3 million people. Cerebro-vascular disease was also the fifth leading cause of lost productivity, as measured by disability adjusted life years, in 1990, cerebro-vascular disease caused 38.5 million disability adjusted life years throughout the world (18).

Cerebral stroke diagnosis:

Knowing the symptoms of stroke is particularly important for caregivers of stroke survivors, since these patients are at increased risk of another stroke. Most strokes come on suddenly; a more gradual onset is unusual but not impossible, particularly in the case of an ischemic stroke. Symptoms can appear at the moment of the actual stroke, or minutes or even hours later, since each side of the brain controls the opposite side of the body, if the stroke is in the left side of the brain, the right side of the body will be affected, and vice versa. The most common diagnostic procedures include the following:

1 - Physical examination to distinguish stroke from stroke mimics, and include careful head and neck examination for signs of trauma, infection, and meningeal irritation.

2 - Neurological examination to evaluate mental status and level of consciousness, cranial nerves, motor function, sensory function, cerebral function and deep tendon reflexes.

3 - Lab studies, CBC, coagulation studies, and basic biochemistry panel.

4 - Imaging studies:

- Head CT scans, CT is now firmly established as the mainstay of imaging for the diagnosis of brain disease. It is cheap, effective and fairy widely available, studies before the era of the CT scan were able to achieve an accurate pathological diagnosis in only about 30% of cases of stroke and that there was, therefore, a need for CT scan (19). It has certain limitations, however, and these include poor differentiation between grey and white matter, relative insensitivity to early disease and problems with image artifacts in the posterior fossa and skull base. CT scan may also fail to demonstrate some parenchymal hemorrhages smaller than 1 cm. CT scan will be normal if done within 6 hours for those have onset of ischemic stroke symptoms. After 6 - 12 hours, sufficient edema is recruited into the stroke area to produce a regional hypodensity on CT scan. A large hypo dense area present on CT scan within the first 3 hours of symptoms onset should prompt careful requisitioning regarding the time of the stroke symptoms onset.

- Magnetic resonance imaging (MRI) uses energy from a magnetic field to generate images of the brain. It is useful for patients with acute ischemic stroke involving cerebellar or lacunar pathology.

Disadvantages include high cost, lack of ready availability at most centers, and insensitivity for detecting early hemorrhage (18) (20).

Stroke risk factors

Several factors are known to increase the liability of stroke. The most important of these are hypertension, heart disease, atrial fibrillation, diabetes mellitus, cigarette smoking of long duration, hyper-lipidemia, and others, including use of birth control pills and systematic disease associated with a hyper -coagulable state.

The more risk factors a person has, the greater the chance that he or she will have a stroke. Some of these can't be controlled, such as increasing age, family health history, prior stroke, race and gender, but you can modify, treat or control most risk factors to lower your risk of stroke (26).

- **Increasing age:** The chance of having a stroke more than doubles for each decade of life after age 55. While stroke is common among the elderly, substantial numbers of people under 65 also have stroke (26). There are few studies on ischemic stroke in the very old age, a study of Lausanne Stroke Registry, 1995-6, carried out by Freitas et al, dealt with risk factors, etiology, clinical findings, lesion topography and short term (one month) outcome in patients aged 80 years or older presenting with a first ever ischemic stroke compared to younger patient, aged between 45 and 79 years. 13% were older than 80 years. And 87% were between 45 and 79 years (21).

Ward et al in 1986 showed that the average annual incidence for stroke was increased from 4.11 / 1000 person / year at age less than 65 years to 8.52 / 1000 person / year at age group 65 – 74, and then it was doubled in age group of more than 75 years (22).

- **Sex**: The incidence is higher among men than among women in all age groups, with the male / female ratio varying between 1.2: 1. Women are, on average; older than men are when they have their first stroke. In Minnesota the mean age for men suffering from a first stroke was 69 years; for women it was 77 years (23).

Gross et al conducted a retrospective study in south Alabama in 1980, including 139 cases aged older than 20 years to study the diagnostic features and risk factors of cerebral stroke. They revealed that the age adjusted incidence for all stroke types in males was 1.39 / 1000 persons, while it was lower in females, 1.09 / 1000 persons. Depending on the type of stroke, they revealed that the incidence of intrahemorrhagic stroke was two times higher in females than in males, while the incidence of ischemic stroke was twice higher in males than in female's (24).

- **Heredity and race**: The chance of stroke is greater in people who have a family history of stroke. African Americans have a much higher risk of death and disability from a stroke than whites, in part because blacks have a greater incidence of high blood pressure and diabetes.

A prospective community stroke register 1995 – 6 with multiple notification sources, pathological classification of stroke in all cases was

based on brain imaging or necropsy data, rates were standardized to European and world populations and adjusted for age, sex, and social class in multivariate analysis, a multi- ethnic population of 234,533 in South London, of whom 21% are black. Stewart et al found a twofold excess of first ever stroke in black people. The increased incidence in black people could not be attributed to social class confounding; black people tend to have their first stroke at a younger age than white people do (25).

- **High blood pressure**: High blood pressure is defined in an adult as a systolic pressure of 140-mm Hg or higher and /or a diastolic pressure of 90-mm Hg or higher for an extended time. It's the most important risk factor for stroke. Many people believe the effective treatment of high blood pressure is a key reason for the accelerated decline in the death rates of stroke. Hypertension promotes stroke by aggravating atherosclerosis in the aortic arch and cervico-cerebral arteries, causing arteriosclerosis and lipohyalinosis in the small diameter, penetrating end arteries of the cerebrum, and contributing to heart disease, of which stroke is a complication (26).

A case – control study of population based in East Lancashire Health District during 1994 and 1995, matched with a participating population of 388,821 aged 80 by Xianglin Du, Kennedy Cruickshank, and others. Cases were patients under 80 with their first stroke identified from a population based stroke register between 1 July 1994 and 30 June 1995. For each case two controls matched with the case for age and sex were selected from the same practice register. Hypertension was defined as systolic blood

pressure 160-mm Hg or diastolic blood pressure 95-mm Hg, or both, on at least two occasions within any three-month period or any history of treatment with antihypertensive drugs. Records of 267 cases and 534 controls were examined, 61% and 42% of these subjects respectively were hypertensive. Detection and treatment rates of hypertension were high but control of blood pressure to below 150/90 mm Hg in treated hypertensive patients was only 33% in cases and 42% in controls, when achieving optimal control of hypertension (to > 150 / 90 mm Hg) in the most at risk and treatable age range (40 –79 years) 86 hypertensive patients currently not well controlled need to be treated over five years to prevent one stroke (27).

- **Diabetes mellitus**: Diabetes is an independent risk factor for stroke and is strongly correlated with high blood pressure, while diabetes is treatable, having it still increases a person's risk of stroke. People with diabetes mellitus often have high cholesterol and overweight, increasing their risk even more (26). The Greater Cincinnati / Northern Kentucky stroke study provides epidemiologic diabetics, so all strokes occurring between 1/1/93 – 31/12/93 for blacks and 7/1/93 –31/12/93 for whites were identified by surveillance of discharge codes from hospitals. A preliminary analysis of the population based study data reveals that diabetics have approximately a three fold higher incidence of stroke as compared to non-diabetics, with slightly higher relative risk for white (28).

Another prospective study was carried out by Basir et al in 2000 in Jinnah Medical Center /Pakistan. Of 50 acute stroke patients with and without diabetes, infarction versus hemorrhage was studied. Brain CT scan was

performed in all these patients. It was concluded that in diabetics, the frequency of ischemic stroke is much higher as compared to hemorrhage (29).

- **Prior stroke and transient ischemic attacks, (TIA)**: The risk of stroke for someone who has already had one is many times that of a person who has not. T I As are mini strokes that produce stroke- like symptoms, but no lasting damage. They're strong predictors of stroke. A person who had one or more TIAs is almost 10 times more likely to have a stroke than some one of the same ages and sex who hasn't (26). Cohort study by Johnston et al conducted from March 1997 through February 1998, 16 hospitals in California and a total of 1707 patients. The mean age 72 years presented with TIA. They found that 180 patients 10.5% returned with a stroke, 45 deaths 2.6% and 216 recurrent TIAs (12.7 %)(30).

- **Heart disease**: A diseased heart increases the risk of stroke. In fact, people with heart problems have more than twice the risk of stroke as people who have hearts work normally. Atrial fibrillation increases risk of stroke 5–fold, this with age, duration of atrial fibrillation, hypertension and heart failure, acute myocardial infarction with large left ventricular wall motion abnormal echocardiography predispose to left ventricular thrombus also will increase risk of stroke. Heart attack is also the major cause of death among stroke survivor's (26). A prospective study from 1985 to 1994 by Mooe et al, from a population of approximately 31,000,025 – to 74 years old inhabitants, case subjects with a stroke within one month after an MI were prospectively recorded in the population based Northern

Sweden Monica. The same number of control subjects with a MI but without a stroke was matched for age, sex and year. When MI occurred, they found that the risk of stroke is the highest in the first 5 days after MI. The most important predictors of M I related stroke are a trial fibrillation, ST elevation, and a history of a previous strokes (31).

A study was conducted in seven countries in Europe, in which 4,462 stroked patients were evaluated for risk factors, AF was found to be present in 803 patients (18 %), at three months 32.8% of the AF stroked patients died (32).

- **Red blood cell count**: A moderate or marked increase in the red blood cell count is a risk factor for stroke. The reason is that more red blood cells thicken the blood and make clots more likely. Cerebral blood flow is significantly reduced in polycythemia and predisposes to thrombus formation; it impairs normal uptake of oxygen by tissues and impairs the microcirculation (33).

Pearce et al, describe three patients who had lacunes in association with a raised packed cell volume due to polycythemia, case 1 red cell counts 6.5, case 2 red cell counts 6.34, and case 3 red cell counts 5.90, and all are treated with venosection (33).

- **Serum cholesterol**: An increase in serum cholesterol could lead to athero-sclerosis of the internal carotid artery and the larger cerebral arteries and to

subsequent ischemic stroke. This condition may be further aggravated by hypertension and may lead to hemorrhagic stroke (26).

A retrospective study in acute stroke unit of inner city general hospital by Dyker et al investigated the association between serum cholesterol and cerebro vascular disease, 977 patients with acute stroke were included. The main outcome measures: serum total cholesterol concentration, type of stroke investigated by CT or MRI, three month out come (good (alive at home) or bad (dead or in care), long term mortality. Results were higher serum cholesterol concentrations associated with long-term mortality after stroke. Independently of stroke type, vascular territory and extent, age, and hyperglycemia, three-month out come was also influenced independently by serum cholesterol (34).

- **Cigarette smoking**: In recent years studies have shown cigarette smoking to be an important risk factor for stroke. The nicotine and carbon monoxide in cigarette smoke damage the cardiovascular systems in many ways (26).

The Framingham Heart Study through 1988, was among the first to assess this relation of smoking to types of stroke. It concluded that smoking made a significant independent contribution to the risk of stroke generally and to brain infarction specifically. The relative risk of stroke in heavy smokers (> 40 cigarettes / day) was twice that of light smokers (< 10 cigarette / day), and the risk of stroke increased with the number of cigarettes smoked. Cessation lowered the relative risk ratio to that of non smoker. This reduction in risk ratio was significant by two years after stopping and had reached the level of any one smoker in five years (35).

In a meta analysis of 32 separate studies, Shinton and Beevers showed that cigarette smoking independently contributed to the incidence of stroke: the greatest risk was sub arachnoid hemorrhage, followed by ischemic stroke. Heavy smokers have a relative risk of stroke 2- 4 times greater than non-smoker's (36).

Survival of stroke patient:

Mortality rates for stroke in the United States are among the lowest in the world. About 85% of people who have strokes in this country survive them. Many people completely recover from stroke, some times spontaneously with out rehabilitation. About 20% are capable of taking care of themselves by two weeks after the stroke, with no rehabilitation necessary. More than a million survivors live today with little or no long-term impairment from their stroke. The potential for recovery is good because neurons in the brain are often damaged and not destroyed by stroke, and the damage may be reversible.

However, stroke survivors are frequently left with severe physical and mental disabilities. The damage that stroke causes in the brain can affect the whole body, 20% of stroke survivors will have such serious resulting disability that they will never walk again and will require assistance with activities of daily living for the rest of their lives. About 2 million survivors live with crippling paralysis, speech loss, and memory problem (6).

It has been estimated that up to 15% of survivors at one to three weeks after stroke, has been persisting a significant disability. Of those who survive for one year after stroke (37):

*About half remain dependent on others for at least some activities of daily living (showering, toileting).

*Close to 75% have difficulty with more demanding activities such as housework or shopping?

*About 30% have some degree of dementia or cognitive impairment.

*About 20% have some degree of speech impairment.

*About 20% have major emotional or adjustment problems, with high proportion of those suffering disability, anxiety or depression.

*About 80% have some degree of independent mobility, many have difficulty walking out side, climbing steps, doing house work or use public transport.

A study of randomized trial, Lewis et al followed 307 stroked patients. It was found that 82 patients (22%) died within three years as a result of negative attitude (38).

The levels of the best evidence for stroke prevention:

1- Primary prevention could be reached by population education, by attempting to suppress the development of risk factors. Modification of life style is the first line of the work, and the targets to modify are poor diet, alcohol drinking, smoking and lack of physical activity. Clear recommendations must be given for weight reduction, decreased salts and animal fat intake, smoke cessation, increased exercise. The second step is an individual approach and aims to detect hypertension and a trial fibrillation and introduces specific treatment (2).

2-Secondary stroke prevention concerns patients with risk of stroke or transient ischemic attacks. This includes specific drugs, which have proven for reducing stroke recurrence.

3-Tertiary prevention consists in patient rehabilitation after stroke, in order to recover partial or complete independence and to improve quality of life. 40 % of patients living at home after stroke need help in daily living. It will probably be a challenge in the future to improve hospital and community rehabilitation programs in a way to give to patient's maximum independence and diminish the cost of hospitalization and disability (39).

A study by researchers in Melbourne, Florida, using the medical records of 215 stroked patients, showed that the patients who had hypertension 171 (90.5%), 120 (70%) had been receiving treatment prior stroke and 142 (83%) after the event (40).

Case fatality rate:

Stroke in women seems to be less common but more serious than in men. In Minnesota, the one- month case fatality rate was found to be 14% among men and 25 % among women(23). And in northern Sweden were 20% and 23% respectively (41). In the WHO Monica project, the one- month case fatality rate was higher among women than among men in 15 of 18 populations studied (42).

Chapter Three

Methodology

Methodology

This study has been carried out to estimate the frequency of cerebral stroke, and to identify the possible risk factors and different types of stroke patients admitted at hospitals of North West Bank districts.

Design of the study:

A retrospective study, including all patients fully admitted to hospitals of the study and registered and diagnosed as stroke patients, was conducted from medical records, discharge summary and brain CT reports of in patients admitted to north West Bank hospitals (Al wattani, Ittihad, St. Leukes, Tulkarm, Qalqelia and Jenin hospitals) during a year period (January 1st, 2000 to December 31, 2000).

Study setting:

1 - Demographic data

The West Bank area is about 5,800 square km. It is a hilly region composed of the Jerusalem Mountains in the center, Hebron Mountains in the south, and the Jordan valley area in the east. It divided into Nablus, Salfit, Tulkarm, Qalqelia and Jenin cities in the north, Hebron City in the south, and Jerusalem, Ramallah and Jericho cities in the middle of the West Bank.

According to the population census in 1997, the total population of the West Bank, Gaza strip and Jerusalem was estimated to be 2,895,683, around 1,544,875 were in the West Bank and 328,601 were in Jerusalem. The

refugees form 30 % of the population of the West Bank. The number of the population in the north districts is Jenin (203,026), Tubas (36609), Tulkarm (134,110), Qalqelia (72,007), Salfit (48,538) and Nablus (261,346) (43).

The age structure of the population in Palestine is not particularly different from that in other Middle East countries, 47 % of the population in 1997 was under 15 years of age, 49.4 % was between 15 - 64 age and 3.5 % was 65 years of age, the fertility rate was 6.1% with infant mortality rate of 24.2 / 1000, and life expectancy 71.35 year) (44).

The local economy depends on agriculture, industry, trade, and governmental employment.

2 - Health services:

Health services are divided into four categories:

- Governmental services: These services are provided through primary health care centers, and hospitals, to the majority of the population, particularly, governmental employees, and the participants in the governmental assurance governmental hospitals in the north west bank districts.

The hospital	Number of beds
Al –Wattani	94
Rafedia	144
Jenin	86
Tulkarem	67

- U.N.R.W.A: These services by UNRWA are provided to the Palestinians who have U.N.R.W.A. Registration cards, it provides free, preventive treatment services, and own Qalqelia hospital with 38 beds.

- Non governmental organizations: This sector participates in a large proportion of local health care needs through emergency centers and primary health care clinics.

The hospital	number of beds
Al-Ittihad Hospital	74
St.leukes Hospital	48
Alshefa Hospital	10

- Private sector: It provides services through private clinics, laboratories, physiotherapy centers, and diagnostics X-ray center (45).

Study Population:

It included 784 registered files of all cerebral stroke patients admitted to the hospitals of North West Bank Districts to receive medical intervention during the research period. The cases included who had sings and symptoms of neurologic dificit lasting more than 24 hours regardless age, and had brain CT finding. However, 522 cases were included in this study. 262 files were lost or with severe lack of information were excluded.

The cerebral stroke patients were classified into the following groups according to brain CT findings:

1- Cases with ischemic stroke.

2- Cases with hemorrhagic stroke.

3- Cases with no apparent lesion.

4- Cases with not available information about brain CT.

Instrument:

The tool used was a questionnaire developed by the researcher (see the appendix).

This form include the following:

1. Demographic data, which include age, sex employment, and social status.
2. Past history of medical problems which include heart disease, hypertension, diabetes mellitus, transient ischemic attack, and previous stroke.
3. Past family history of medical problems which include hypertension, diabetes mellitus, stroke, cardiac problems or not available information.
4. Medications that used before hospital admission, anti-hypertension, anti-coagulant or anti-platelets, anti-diabetics, others and none drugs.
5. Bio chemical levels, which include cholesterol, LDL, HDL, hematocrite, platelets, red blood cells, and blood sugar.
6. Data concerning brain CT scan findings were not available in some charts.
7. Out come which include improved, disabled or dead.
8. Data concerning smoking was not available in some files.

Ethical approval:

Permissions were obtained from the Health Ministry and the hospitals' directors to conduct this research at hospitals of North West Bank districts.

Method:

After obtaining the permission from the Health Ministry and hospitals' directors, the data were collected according to the researcher's form, and Neuro- surgeon to insure the accuracy checked these data.

Variables of the study:

- Biodemographic characteristics:
  - -Age of the patient in years at time of admission.
  - -Sex of the patient at time of admission.
  - -Social status of the patient (single or married).
  - -Employment status of the patient (employed, unemployed).
- Past history of medical problems that were diagnosed by specialists and were taking treatment:
  - -Hypertension.
  - -Diabetes mellitus.
  - -Cardiac disease that includes atrial fibrillation and myocardial infarction.
  - -Previous history of transient ischemic attacks.
  - -Previous cerebral stroke.
- Past family history of medical problems:
  - -Hypertension.
  - -Diabetes mellitus.
  - -Stroke.
  - -Cardiac diseases.
  - -Not available.

- Medication used before admission as antihypertensive drugs, anticoagulant or anti-platelets drugs, antidiabetic drugs, other drugs and non-drugs.
- Blood biochemical levels:
  -Packed cell volume (%).
  -Blood sugar (mg / dl).
  -Platelets count (cell/ mm^3).
  -Serum cholesterol (mg/dl).
  -LDL (mg/dl).
  -HDL (mg/dl).

- Measurement of systolic and diastolic bloods pressure with sphygmomanometer (mm Hg).

- Smoking, (smoker or non-smoker), if smoker 1–9 cigarettes, 10 – 19 cigarettes, 20 cigarettes or more or not- available.

- Duration of smoking (1- 4 years duration, 5 – 9 years and 10 years or more or not available).

- Brain CT scan findings, (ischemic stroke, hemorrhagic stroke, no apparent lesion or not available).

- Outcome, (improved, functional disability, or death).

Data processing and statistical analysis:

All the collected data were entered into the computer. Data were checked. Frequency distribution and cross tabulations of variables produced. SPSS was used for data processing and analysis.

Pilot testing

Three advisors who were researcher and had health background evaluated the items in the instrument. And testing the instrument by opening medical files in 3 hospitals.

Chapter Four

Results

Results

The study included 522 inpatients with cerebral stroke admitted to the hospitals of North West Bank districts. About (271) of the patients were females and (251) were males.

The patients were classified into (336) cases of ischemic stroke and (90) cases of hemorrhagic stroke, (61) cases of no apparent lesion and (35) cases of not available information according to the clinical presentation and brain CT findings.

Bio demographic factors distribution

Table 1 shows that the admission rate of cerebral stroke in the north West Bank hospitals was 34.44% at Al-Wattani, 19.13% AL-Ittihad, 18.24% Tulkarem, 12.50 % Jenin, 10.59% St. Leuke's and 5.10%Qalqelia.

Table2 shows that the admission rate of cerebral stroke in female patients was much higher, (51.9%), than in males (48.1%).

Table 3 shows that, in male patients, the proportion of ischemic stroke cases was higher in the age group more than 70 years (43.9%), while the proportion of hemorrhagic stroke cases was more in the age (61-70) years (45.7%). In female patients, the proportion of ischemic stroke cases was more common in the age group (61-70) years (37.8%), while the proportion of hemorrhagic stroke cases was more frequent in the age over 70 year (38.6%).

Table 4 shows that, in both genders, most patients with ischemic stroke cases (97.5% and 98.8% respectively) or hemorrhagic stroke cases (93.5% and 100.0%) were married.

Table 5 shows that, in both males and females, most patients with ischemic stroke were unemployed (83.4% and 95.3% respectively), it also shows that in cases with hemorrhagic stroke in both males and females, the majority was unemployed (80.4% and 97.7% respectively)

Table 1

Admission rates of cerebral stroke cases at the hospitals of North West Bank districts

The hospital	No.	%
Al-wattani	270	34.44%
Tulkarem	143	18.24%
Jenin	98	12.50%
Al-Ittihad	150	19.13%
St.leukes	83	10.59%
Qalqelia	40	5.10%
Total	784	100%

Table 2

Sex distribution of cerebral stroke patients

Sex	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Male	164	48.8	46	51.1	26	42.6	15	42.9	251	48.1
female	172	51.2	44	48.9	35	57.4	20	57.1	271	51.9
Total	336	100.0	90	100.0	61	100.0	35	100.0	522	100.0

Table 3

Age distribution of cerebral stroke patients by gender

Male

Age	Ischemic Stroke No. %	Hemorrhagic Stroke No. %	No apparent lesion No. %	Not available No. %	Total No. %
<50 years	8 4.9	2 4.3	5 19.2	1 6.7	16 6.4
50- 60 years	34 20.7	8 17.4	6 23.1	1 6.7	49 19.5
61- 70 years	50 30.5	21 45.7	8 30.8	8 53.3	87 34.7
>70 years	72 43.9	15 32.6	7 26.9	5 33.3	99 39.4
Total	164 100.0	46 100.0	26 100.0	15 100.0	251 100.0

Female

Age	Ischemic Stroke No. %	Hemorrhagic Stroke No. %	No apparent lesion No. %	Not available No. %	Total No. %
<50 years	11 6.4	3 6.8	6 17.1	- -	20 7.4
50- 60 years	38 22.1	8 18.2	5 14.3	4 20.0	55 20.3
61- 70 years	65 37.8	16 36.4	13 37.1	9 45.0	103 38.0
> 70 years	58 33.7	17 38.6	11 31.4	7 35.0	93 34.3
Total	172 100.0	44 100.0	35 100.0	20 100.0	271 100.0

Table 4

Marital status distribution of cerebral stroke patients by gender

Male

Marital status	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Single	4	2.5	3	6.5	-	-	1	6.7	8	3.2
Married	159	97.5	43	93.5	25	100.0	14	93.3	241	96.8
Total	163	100.0	46	100.0	25	100.0	15	100.0	249	100.0

Female

Marital status	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Single	2	1.2	-	-	-	-	1	5.0	3	1.1
Married	168	98.8	44	100.0	35	100.0	19	95.0	266	98.9
Total	170	100.0	44	100.0	35	100.0	20	100.0	269	100.0

Table 5

Employment status of cerebral stroke patients by gender

Male

Employment status	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Employed	27	16.6	9	19.8	10	40.0	2	13.3	48	19.3
Unemployed	136	83.4	37	80.4	15	60.0	13	86.7	201	80.7
Total	163	100.0	46	100.0	25	100.0	15	100.0	249	100.0

Female

Employed status	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Employed	8	4.7	1	2.3	2	5.7	-	-	11	4.1
Unemployed	163	95.3	43	97.7	33	94.3	19	100.0	258	95.9
Total	171	100.0	44	100.0	35	100.0	19	100.0	269	100.0

History of medical problems

Table 6 shows that, in male and female patients, the proportion of patients with ischemic stroke cases was higher in those who had history of hypertension (65.9% and 68.0% respectively) than who hadn't and the proportion of patients with hemorrhagic stroke cases was higher in those who had history of hypertension (76.1% and 75.0% respectively).

Table 7 shows that, in male and female patients, the proportion of patients with ischemic stroke cases was higher in those who had history of diabetes mellitus (53.7% and 52.3% respectively), while the proportion of patients with hemorrhagic stroke cases was higher in those who hadn't history of DM (52.2% and 63.6% respectively).

Table 8 shows that, in male and female patients, the proportion of patients with ischemic stroke cases was in those who had history of atrial fibrillation (25.6% and 30.2% respectively) and the proportion of patients with hemorrhagic stroke cases was in those who had history of atrial fibrillation (21.7% and 11/4% respectively).

Table 9 shows that, in male and female patients, the proportion of patients with ischemic stroke cases was in those who had history of myocardial infarction (11.6% and 7.6% respectively) and the proportion of hemorrhagic stroke cases was in those who had history of myocardial infarction (13.0% and 15.9% respectively).

Table 10 shows that, in male and female patients, the proportion of patients with ischemic stroke cases was in those who had history of transient ischemic attack (11.0% and 5.8% respectively) and the proportion of hemorrhagic stroke cases was in those who had history of TIA (10.9% and 11.4% respectively).

Table 11 shows that, in male and female patients, the proportion of patients with ischemic stroke cases was higher in those who had history of previous stroke (52.4% and 52.3% respectively) and the proportion of patients with hemorrhagic stroke cases was higher in those who had history of previous stroke (56.5% and 52.3% respectively).

Table 6

History of hypertension among cerebral stroke patients by gender

Male

HTN	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	108	65.9	35	76.1	12	46.2	10	66.7	165	65.7
No	56	34.1	11	23.9	14	53.8	5	33.3	86	34.3
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

HTN	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	117	68.0	33	75.0	21	60.0	13	65.0	184	67.9
No	55	32.0	11	25.0	14	40.0	7	35.0	87	32.1
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Table 7

History of diabetes mellitus among cerebral stroke patients by gender

Male

DM	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	88	53.7	22	47.8	17	65.4	8	53.3	135	53.8
No	76	46.3	24	52.2	9	34.6	7	46.7	116	46.2
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

DM	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	90	52.3	16	36.4	11	31.4	7	35.0	124	45.8
No	82	47.7	28	63.6	24	68.6	13	65.0	147	54.2
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Table 8

History of a trial fibrillation among cerebral stroke patients by gender

Male

AF	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	42	25.6	10	21.7	8	30.8	3	20.0	63	25.1
No	122	74.4	36	78.3	18	69.2	12	80.0	188	74.9
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

AF	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	52	30.2	5	11.4	4	11.4	10	50.0	71	26.2
No	120	69.8	39	88.6	31	88.6	10	50.0	200	73.8
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Table 9

History of myocardial infarction among cerebral stroke patients by gender

Male

Myocardial infarction	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	19	11.6	6	13.0	2	7.7	3	20.0	30	12.0
No	145	88.4	40	87.0	24	92.3	12	80.0	221	88.0
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

Myocardial infarction	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	13	7.6	7	15.9	1	2.9	3	15.0	24	8.9
No	159	92.4	37	84.1	34	97.1	17	85.0	247	91.1
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Table 10

History of transient ischemic attack among cerebral stroke patients by gender

Male

Transient ischemic attack	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	18	11.0	5	10.9	5	19.2	3	20.0	31	12.4
No	146	89.0	41	89.1	21	80.8	12	80.0	220	87.6
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

Transient ischemic attack	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	10	5.8	5	11.4	11	31.4	2	10.0	28	10.3
No	162	94.2	39	88.6	24	68.6	18	90.0	243	89.7
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Table 11

History of previous stroke among cerebral stroke patients by gender

Male

Previous stroke	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	86	52.4	26	56.5	6	23.1	8	53.3	126	50.2
No	78	47.6	20	43.5	20	76.9	7	46.7	125	49.8
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

Previous stroke	Ischemic Stroke		Hemorrhagic Stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	90	52.3	23	52.3	10	28.6	14	70.0	137	50.6
No	82	47.7	21	47.7	25	71.4	6	30.0	134	49.4
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Clinical investigations at time of admission

Table 12 shows that, in male and female patients, the proportion of patients who had packed cell volume more than 45% was found only in cases with ischemic stroke (2.5% and 1.7% respectively).

Table 13 shows that, in male and female patients, the proportion of patients with ischemic stroke who had blood sugar level more than 120 mg/dl was higher (62.6% and 66.1% respectively) and the proportion of patients with hemorrhagic stroke who had blood sugar level more than 120mg/dl was higher (71.7% and 63.6% respectively).

Table 14 shows that, in both male and female patients, the proportion of cases with ischemic stroke was higher in those who had platelets count below ($250*10^3$ cell/mm^3) (61.1% and 55.2% respectively) and the proportion of cases with hemorrhagic stroke was higher in those who had platelets count below $250*10^3$ cell/mm^3 (63.0% and 56.8% respectively).

Table 15 shows that, in male and female patients, the proportion of cases with ischemic stroke was higher in those who had serum cholesterol level below or equal (310 mg/dl) (95.0% and 100.0% respectively) and the proportion of cases with hemorrhagic stroke was higher in those who had serum cholesterol level below or equal 310mg/dl (80.0% and 100.0% respectively).

Table 16 shows that in male and female patients, the proportion of cases with ischemic stroke was higher in those had systolic blood pressure equal or more than 160 mm Hg (100.0% and 73.7% respectively) and the proportion of cases with hemorrhagic stroke was higher in those who had systolic blood pressure more equal 160mm Hg (64.9% and 61.5% respectively).

Table 17 shows that, in male and female patients, the proportion of cases with ischemic stroke was higher in those who had diastolic blood pressure below or equal 90 mm Hg (62.2% and 57.0% respectively), while in male and female patients, the proportion of cases with hemorrhagic stroke was higher in those who had diastolic blood pressure more 90mm Hg (60.9% and 61.4% respectively).

Table 12

Packed cell volume distribution among cerebral stroke patients by gender

Male

Packed cell volume	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
≤45	159	97.5	46	100.0	26	100.0	15	100.0	246	98.4
>45	4	2.5	–	–	–	–	–	–	4	1.6
Total	163	100.0	46	100.0	26	100.0	15	100.0	250	100.0

Female

Packed cell volume	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
≤45	169	98.3	44	100.0	35	100.0	20	100.0	268	98.9
>45	3	1.7	–	–	–	–	–	–	3	1.1
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Table 13

Blood sugar distribution among cerebral stroke patients by gender

Male

Blood sugar mg/dl	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
≤120	61	37.4	13	28.3	10	38.5	7	46.7	91	36.4
>120	102	62.6	33	71.7	16	61.5	8	53.3	159	63.6
Total	163	100.0	46	100.0	26	100.0	15	100.0	250	100.0

Female

Blood sugar mg/dl	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
≤120	58	33.9	16	36.4	18	51.4	11	55.0	103	38.1
>120	113	66.1	28	63.6	17	48.6	9	45.0	167	61.9
Total	171	100.0	44	100.0	35	100.0	20	100.0	270	100.0

Table 14

Platelets count distribution among cerebral stroke patients by gender

Male

Platelets count	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
<250	99	61.1	29	63.0	15	57.7	11	73.3	154	61.8
≥250	63	38.9	17	37.0	11	42.3	4	26.7	95	38.2
Total	162	100.0	46	100.0	26	100.0	15	100.0	249	100.0

Female

Platelets count	Ischemic stroke		Intra hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
<250	95	55.2	25	56.8	18	51.4	14	70.0	152	56.1
≥250	77	44.8	19	43.2	17	48.6	6	30.0	119	43.9
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Table 15

Serum cholesterol distribution among cerebral stroke patients by gender

Male

Serum cholesterol mg/dl	Ischemic stroke No.	%	Hemorrhagic stroke No.	%	No apparent lesion No.	%	Not available No.	%	Total No.	%
≤310	19	95.0	4	80.0	6	85.7	2	66.7	31	88.6
>310	1	5.0	1	20.0	1	14.3	1	33.3	4	11.4
Total	20	100.0	5	100.0	7	100.0	3	100.0	35	100.0

Female

Serum cholesterol mg/dl	Ischemic stroke No.	%	Hemorrhagic stroke No.	%	No apparent lesion No.	%	Not available No.	%	Total No.	%
≤310	12	100.0	2	100.0	9	90.0	2	100.0	25	96.2
>310	–	–	–	–	1	10.0	–	–	1	3.8
Total	12	100.0	2	100.0	10	100.0	2	100.0	26	100.0

Table 16

Systolic blood pressure distribution among cerebral stroke patients by gender

Male

Systolic blood pressure mm Hg	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
≥160	15	100.0	163	64.9	103	62.8	22	47.8	23	88.5
<160	_	_	88	35.1	61	37.2	24	52.2	3	11.5
Total	15	100.0	251	100.0	164	100.0	46	100.0	26	100.0

Female

Systolic blood pressure mm Hg	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
≥160	14	73.7	166	61.5	112	65.1	18	40.9	22	62.9
<160	5	26.3	104	38.5	60	34.9	26	59.1	13	37.1
Total	19	100.0	270	100.0	172	100.0	44	100.0	35	100.0

Table 17

Diastolic blood pressure distribution among cerebral stroke patients by gender

Male

Diastolic blood pressure mm Hg	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
≤90	102	62.2	18	39.1	18	69.2	13	86.7	151	60.2
>90	62	37.8	28	60.9	8	30.8	2	13.3	100	39.8
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

Diastolic blood pressure mm Hg	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
≤90	98	57.0	17	38.6	19	54.3	13	68.4	147	54.4
>90	74	43.0	27	61.4	16	45.7	6	31.6	123	45.6
Total	172	100.0	44	100.0	35	100.0	19	100.0	270	100.0

Outcome

Table 18 shows that, in male and female patients, the proportion of ischemic stroke cases was higher in those who were disabled (52.4% and 45.0% respectively), while in male patients, the proportion of hemorrhagic stroke cases was higher in those who were dead (47.8%), but in female patients, the proportion of hemorrhagic stroke cases was higher in those who were disabled (45.5%).

Table 18

Outcome distribution

Among cerebral stroke patients by gender

Male

Outcome	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Improvement	63	38.4	5	10.9	24	92.3	2	15.4	94	37.8
Functional disabilities	86	52.4	19	41.3	2	7.7	10	76.9	117	47.0
Death	15	9.1	22	47.8	_	_	1	7.7	38	15.2
Total	164	100.0	46	100.0	26	100.0	13	100.0	249	100.0

Female

Outcome	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Improvement	77	45.0	6	13.6	34	97.1	7	35.0	124	45.9
Functional disabilities	77	45.0	20	45.5	1	2.9	13	65.0	111	41.1
Death	17	9.9	18	40.9	_	_	_	_	35	13.0
Total	171	100.0	44	100.0	35	100.0	20	100.0	270	100.0

Family medical history

Table 19 shows that, in Male and female patients, the proportion ischemic stroke cases was higher in those who had family history with hypertension (82.3% and 83.7% respectively) and the proportion of hemorrhagic stroke cases was higher in those who had family history with hypertension (91.3% and 79.5% respectively).

Table 20 shows that, in male and female patients, the proportion of ischemic stroke cases was higher in those who had family history with diabetes mellitus (91.5% an d 87.2% respectively) and the proportion of hemorrhagic stroke ceases was higher in those who had family history with DM (95.7% and 93.2% respectively).

Table 21 shows that, in male and female patients, the proportion of ischemic stroke cases was higher in those who had family history with stroke (86.6% and 84.3% respectively) and the proportion of hemorrhagic stroke cases was higher in those who had family history with stroke (93.5% and 81.8% respectively).

Table 22 shows that, in male and female patients, the proportion of ischemic stroke cases was higher in those who had family history with cardiac diseases(92.7% and 89/5% respectively) and the proportion of hemorrhagic stroke cases was higher in those who had family history with cardiac disease (95.7% and 90.9% respectively).

Table 19

Family history of hypertension among cerebral stroke patients by gender

Male

Family history with HTN	Ischemic stroke No. %		Hemorrhagic stroke No. %		No apparent lesion No. %		Not available No. %		Total No. %	
Yes	135	82.3	42	91.3	21	84.0	14	93.3	212	84.8
No	29	17.7	4	8.7	4	16.0	1	6.7	38	15.2
Total	164	100.0	46	100.0	25	100.0	15	100.0	250	100.0

Female

Family history with HTN	Ischemic stroke No. %		Hemorrhagic stroke No. %		No apparent lesion No. %		Not available No. %		Total No. %	
Yes	144	83.7	35	79.5	26	74.3	20	100.0	225	83.0
No	28	16.3	9	20.5	9	25.7	_	_	46	17.0
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Table 20

Family history of diabetes mellitus among cerebral stroke patients by gender

Male

Family history with DM	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	150	91.5	44	95.7	23	92.0	15	100.0	232	92.8
No	14	8.5	2	4.3	2	8.0	_	_	18	7.2
Total	164	100.0	46	100.0	25	100.0	15	100.0	250	100.0

Female

Family history with DM	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	22	12.8	3	6.8	3	8.6	_	_	28	10.3
No	150	87.2	41	93.2	32	91.4	20	100.0	243	89.7
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Table 21

Family history of stroke among cerebral stroke patients by gender

Male

Family history with stroke	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	142	86.6	43	93.5	21	80.7	14	93.3	220	87.8
No	22	13.4	3	6.5	5	19.3	1	6.7	31	12.2
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

Family history with stroke	Ischemic stroke		Hemorrhagic stroke		No apparent Lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	145	84.3	36	81.8	32	91.4	20	100.0	233	86.0
No	27	15.7	8	18.2	3	8.6	_	_	38	14.0
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Table 22

Family history of cardiac disease among cerebral stroke patients by gender

Male

Family history with cardiac diseases	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	152	92.7	44	95.7	20	76.9	13	86.7	229	91.2
No	12	7.3	2	4.3	6	23.1	2	13.3	22	8.8
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

Family history with cardiac diseases	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
No	154	89.5	40	90.9	31	88.6	20	100.0	245	90.4
Yes	18	10.5	4	9.1	4	11.4	_	_	26	9.6
Total	172	100.0	44	100.0	35	100.0	20	100.0	271	100.0

Smoking

Table 23 shows that, in male patients the proportion of ischemic stroke and hemorrhagic stroke cases who were smokers was higher (78.2% and 84.2% respectively), while in female patients the proportion of ischemic stroke and hemorrhagic stroke cases who were not smoker was higher (89.2% and 94.1% respectively).

Table 24 shows that, in male patients, the proportion of ischemic stroke and hemorrhage cases who were smoker 20 cigarettes or more per day was higher (74.2% and 76.7% respectively), while in female patients the proportion of ischemic stroke and hemorrhagic stroke cases who were smoker 1-9 cigarettes per day was higher (66.7% and 66.7% respectively).

Table 23

Smoking distribution among cerebral stroke patients by gender

Male

Smoking	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Smoker	93	78.2	32	84.2	12	70.6	5	83.3	142	78.9
Not smoker	26	21.8	6	15.8	5	29.4	1	16.7	38	21.1
Total	119	100.0	38	100.0	17	100.0	6	100.0	180	100.0

Female

Smoking	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Smoker	13	10.8	2	5.9	5	21.7	_	_	20	10.6
Not smoker	107	89.2	32	94.1	18	78.3	11	100.0	168	89.4
Total	120	100.0	34	100.0	23	100.0	11	100.0	188	100.0

Table 24

Daily cigarette distribution among cerebral stroke patients by gender

Male

Daily cigarette	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
1- 9	2	2.2	1	3.3	1	7.1	_	_	4	2.8
10 – 19	22	23.7	6	20.0	1	7.1	_	_	29	20.6
20 and more	69	74.2	23	76.7	12	85.7	4	100.0	108	76.6
Total	93	100.0	30	100.0	14	100.0	4	100.0	141	100.0

Female

Daily cigarette	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No	%	No.	%	No.	%	No.	%
1 – 9	10	66.7	2	66.7	4	66.7	_	_	16	66.7
10 – 19	3	20.0	_	_	_	_	_	_	3	12.5
20 and more	2	13.3	1	33.3	2	33.3	_	_	5	20.8
Total	15	100.0	3	100.0	6	100.0	_	_	24	100.0

Drugs history used before admission

Table 25 shows that, in males and females patients, the proportion of ischemic stroke cases was higher in those patients who were used anti-hypertension drugs before admission (64.6% and 67.3% respectively) and the proportion of hemorrhagic stroke cases was higher in those who were used anti hypertensive drugs before admission (80.4% and 75.0% respectively).

Table 26 shows that, in male and female patients, the proportion of ischemic stroke cases was higher in those who were used anti –coagulant or anti – platelet drugs before admission (70.1% and 77.2% respectively) and the proportion of hemorrhagic stroke cases was higher in those who were used anti coagulant or anti platelet drugs before admission (65.2% and 70.5% respectively).

Table 27 shows that, in male patients the proportion of ischemic stroke cases was higher in those who didn't use anti DM drugs (54.9%), while in hemorrhagic stroke cases the proportion of those who used anti DM drugs before admission was higher (52.2%). In female patients, the proportion of ischemic stroke cases in those who used anti DM drugs before admission was higher (50.3%), while the proportion of hemorrhagic stroke cases who didn't use anti DM drugs before admission was higher (61.4%).

Table 28 shows that, in male patients and female patients, the proportion of ischemic stroke cases in those who used other drugs before admission (73.2%

and 66.1% respectively) and in hemorrhagic stroke cases the proportion of those who used other drugs was higher also (69.6% and 72.7% respectively).

Table 29 shows that, in male and female patients, the proportion of ischemic stroke cases of those who used drugs before admission was higher (95.7% and 98.8% respectively) and the proportion of hemorrhagic stroke cases who used drugs before admission was higher(93.5% and 100.0% respectively).

Table 25

Anti-hypertension drugs used admission distribution among cerebral stroke patients by gender

Male

Anti-hypertension	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	106	64.6	37	80.4	13	50.0	10	66.7	166	66.1
No	58	35.4	9	19.6	13	50.0	5	33.3	85	33.9
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

Anti-hypertension	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	115	67.3	33	75.0	22	62.9	13	65.0	183	67.8
No	56	32.7	11	25.0	13	37.1	7	35.0	87	32.2
Total	171	100.0	44	100.0	35	100.0	20	100.0	270	100.0

Table 26

Anti-coagulant or anti-platelets drugs used before admission distribution by gender

Male

Anti-coagulant or anti-platelets drugs	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	115	70.1	30	65.2	16	61.5	14	93.3	175	69.7
No	49	29.9	16	34.8	10	38.5	1	6.7	76	30.3
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

Anti-coagulant or anti-platelets drugs	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	132	77.2	31	70.5	19	54.3	17	85.0	199	73.7
No	39	22.8	13	29.5	16	45.7	3	15.0	71	26.3
Total	171	100.0	44	100.0	35	100.0	20	100.0	270	100.0

Table 27

Anti diabetic drugs used before admission distribution among cerebral stroke patients by gender

Male

Anti-diabetic drugs	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	74	45.1	24	52.2	9	34.6	7	46.7	114	45.4
No.	90	54.9	22	47.8	17	65.4	8	53.3	137	54.6
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

Anti-diabetic drugs	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	86	50.3	17	38.6	11	31.4	7	35.0	121	44.8
No	85	49.7	27	61.4	24	68.6	13	65.0	149	55.2
Total	171	100.0	44	100.0	35	100.0	20	100.0	270	100.0

Table 28

Other drugs used before admission distribution among cerebral strike patients by gender

Male

Other drugs before admission	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	120	73.2	32	69.6	15	57.7	13	86.7	180	71.7
No	44	26.8	14	30.4	11	42.3	2	13.3	71	28.3
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

Other drugs before admission	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	113	66.1	32	72.7	21	60.0	15	75.0	181	67.0
No	58	33.9	12	27.3	14	40.0	5	25.0	89	33.0
Total	171	100.0	44	100.0	35	100.0	20	100.0	270	100.0

Table 29

No drugs used before admission distribution among cerebral stroke patients by gender

Male

No drugs before admission	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	7	4.3	3	6.5	1	3.8	_	_	11	4.4
No	157	95.7	43	93.5	25	96.2	15	100.0	240	95.6
Total	164	100.0	46	100.0	26	100.0	15	100.0	251	100.0

Female

No drugs before admission	Ischemic stroke		Hemorrhagic stroke		No apparent lesion		Not available		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	2	1.2	_	_	1	2.9	_	_	3	1.1
No	169	98.8	44	100.0	34	97.1	20	100.0	267	98.9
Total	171	100.0	44	100.0	35	100.0	20	100.0	270	100.0

Chapter Five

Discussion

Discussion

Palestine hasn't epidemiological studies of cerebral stroke due to long Israeli occupation and closure of areas.

Cerebral stroke is aging disease, so there is need for studies concerning its history.

Limitations of the study:

1-The study had a large number of records exclusion due to incomplete information and inaccurate diagnosis.

2-The study may not represent the distribution of the stroke in the community because many cases died at homes.

3-Lack in some information such as duration of smoking and number of cigarettes.

The admission rate of cerebral stroke cases in the hospitals of North West Bank districts was high in the governmental hospitals, particularly Al-wattani hospital this clearly demonstrated in (table1). This might be due to economic status of the inhabitants, large district and health insurance.

The proportion of cerebral stroke was higher in females than in males this clearly demonstrated in (table 2). This result was inconsistent with other studies (23) (24) and might be attributed to many discarded files, hormonal disturbance, using oral contraceptives and cooping with stress.

The proportion of cerebral stroke increased with age for both genders this clearly demonstrated in (table 3). This result was consistent with other studies (21).

In both genders the proportion of married and unemployed patients were higher in ischemic stroke cases and hemorrhagic stroke cases than the single and employed this clearly demonstrated in (table 4 and 5). This might be explained by increase of responsibility and socioeconomic status for married and unemployed cases. In males and females, the proportion of cases with hypertension, previous stroke, diabetes mellitus, atrial fibrillation, myocardial infarction and transient ischemic attack were the major risk factors respectively this clearly demonstrated in (table 6-11). This result was consistent with other studies (27) (28) (29) (30) (31) (32).

In both males and females, the proportion of cases with high levels of blood investigations were blood sugar, platelets count, cholesterol and packed cell volume this was clearly demonstrated in (table 12-15). This result was consistent with other studies (28) (29) (33) (34).

In males and females, positive significant association between ischemic stroke and intra hemorrhagic stroke cases and high systolic and diastolic blood pressure, this was clearly demonstrated in (table 16 and 17). This result was consistent with other studies (27).

In male and female patients, the proportion of those improved and disabeled was more in cases with ischemic stroke. However, the proportion

of male and female patients who died was more in cases with hemorrhagic stroke, this clearly demonstrated in (table 18) This result was consistent with other studies(6)(36)(37).

Family history of stroke was found to be a positive risk factor with higher proportion cases in ischemic stroke and hemorrhagic stroke cases. Family history risk factors include respectively, as the study results, hypertension, stroke, diabetes mellitus and cardiac diseases this was clearly demonstrated in (table 19- 22). This result was consistent with other studies (25).

Smoking was confirmed as a positive risk factor for cerebral stroke in male patients. Also the number of cigarettes daily increased the risk of cerebral stroke this was clearly demonstrated in (table 23-24) . This result was consistent with other studies (35) (36). in female patients, smoking and number of cigarettes hadn't effect on stroke this result was inconsistent with other studies (35). This may be due to the females not ordinary smokers in our tradition, also cerebral stroke may be due to other risk factors.

The proportion of cases who used drugs before admission revealed that anti-coagulant or anti-platelets drugs in both genders had serious effect in hemorrhagic stroke, that consider there were no follow up with investigations or physical examination to control blood and check for cerebral stroke this was clearly demonstrated in (table 25-29). And might be due to not regularility in treatment use, or using the medicine for long time with out consult the especialist, so the medicine might be with out benefit, or possibility of other new risk factors happenned.

Conclusion

The study reveals the followings:

1. Age was considered a possible risk factor in patients of cerebral stroke. Cases with ischemic stroke were common among elderly patients. Female cases were more than male cases.

2. The study showed that the patients of cerebral stroke had a higher proportion of hypertension, previous stroke, diabetes mellitus, myocardial infarction, atrial fibrillation and transient ischemic attack.

3. Patients of cerebral stroke had elevation of blood sugar, increased platelets count, serum cholesterol and elevation of packed cell volume.

4. Smoking and number of cigarettes smoked daily were considered possible risk factor in-patients of cerebral stroke, particularly in male patients with ischemic stroke.

5. Patients of cerebral stroke had higher relation with family history of hypertension, stroke, diabetes mellitus and cardiac disease.

6. Cardiac and stroke patients need follow up for anti coagulant drugs.

Recommendations

The following recommendations are suggested:

1. Awareness of the public about the risk factors of stroke and the way of controlling them by health education and promotion programs.

2. Primary health care plays an important role in prevention of stroke, so it will decrease the costs and the psychosocial effects of stroke.

3. A standard plan to enable accurate diagnosis of stroke, including physical and neurological examination, relevant labratory tests and brain CT scan.

4. Further studies are needed for studying the risk factors of cerebral stroke in all districts, data gathered from the patients directly during admission.

5. Medical follow up for the stroke and cardiac patients.

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Appendix

STROKE RISK FACTORS QUESTIONAIRE

❖ Biodemographic characteristics

Age : ( ) years

Gender : Male ( ) Female ( )

Social status : Single ( ) Married ( )

Employment status : Employed ( )

Unemployed ( )

❖ Did any one of your family (mother , father uncles, aunts , grand mother or father had :

1. Hypertension : yes ( ) , no ( )
2. Diabetes mellitus : yes ( ) , no ( )
3. Stroke : yes ( ) , no ( )
4. Cardiac diseases : yes ( ) , no ( )
5. Not available : yes ( ) , no ( )

❖ Past history of medical problems that were diagnosed by specialist and were taking treatment :

- Hypertension : yes ( ), no ( )
- Diabetes mellitus: yes ( ) , no ( )

- Cardiac diseases

- Atrial fibrillation : yes ( ), no ( )
  - Myocardial infarction: yes ( ) , no ( )
- Previous history of
  - Transient ischemic attack : yes ( ) , no ( )
  - Cerebral stroke : yes ( ) , no ( )

❖ Was the patient taking any drugs before admission :

- Antihypertensive drugs : yes ( ) no ( )
-Anticoagulant or anti platelets drugs : yes( ) no ( )
-Antidiabetics drugs : yes( ) no ( )
-Other drugs : yes( ) no ( )
-None drugs : yes ( ) no ( )

❖Blood biochemical levels :

- Red blood cells cell/mm^3
- Heamatocrite %
- Blood sugar mg/dl
- Platelets count cell/mm^3
- Serum cholesterol mg /dl
- LDL mg /dl
- HDL mg / dl

Appendix

STROKE RISK FACTORS QUESTIONAIRE

❖ Biodemographic characteristics

Age : ( ) years

Gender : Male ( ) Female ( )

Social status : Single ( ) Married ( )

Employment status : Employed ( )

Unemployed ( )

❖ Did any one of your family (mother , father uncles, aunts , grand mother or father had :

1. Hypertension : yes ( ) , no ( )
2. Diabetes mellitus : yes ( ) , no ( )
3. Stroke : yes ( ) , no ( )
4. Cardiac diseases : yes ( ) , no ( )
5. Not available : yes ( ) , no ( )

❖ Past history of medical problems that were diagnosed by specialist and were taking treatment :

- Hypertension : yes ( ), no ( )
- Diabetes mellitus: yes ( ) , no ( )

- Cardiac diseases

- No apparent brain lesion : ( )
- Not available : ( )

❖ Out comes

- Improvement : ( )
- Functional disabilities : ( )
- Death ( )

ملخص

دراسة الجلطة الدماغية وعوامل الخطر عند المرضى في مستشفيات شمال الضفة الغربية

الطالب : احمد جمعة ابراهيم علي

هدف الدراسة تحديد عوامل خطر الجلطة الدماغية في مستشفيات شمال الضفة الغربية.

احتوت الدراسة ٥٢٢حالة جلطة دماغيـــة ســجلت فــي مستشــفيات شــمال الضفــة الغربية(الوطني ، جنين ، طولكرم ، الاتحاد ، الانجيلي ، قلقيلية) وذلك خلال فترة البحـــث وتــم جمع المعلومات الطبية والشخصية من السجلات الطبية

:١-مجموعة الحالات الذين عندهم احتشاء دماغي .

٢ -مجموعة الحالات الذين عندهم نزيف في الدماغ .

٣-مجموعة حالات لم تظهر الصور الطبقية أي تغير .

٤-مجموعة حالات الصور الطبقية غير متوفرة .

وتمت معرفة نتيجة الجلطة الدماغية عن طريق استعمال التقارير الطبية عند الخروج مـــن المستشفى .

وقد وجدت الدراسة ان نسبة دخول المرضى من الجلطات الدماغية في المستشفى الوطنـــي ٣٤,٤% ، مستشفى طولكرم ١٨,٢% ،جنين ١٢,٥% ، مستشفى الاتحـــاد ١٩,١% ، الانجيلـــي ١٠,٦% ، مستشفى قلقيلية ٥,١% .

واوضحت الدراسة ان أهم عوامل الخطر للجلطة الدماغية هي :

ارتفاع الضغط ، الجلطات الدماغية السابقة ، ارتفاع سكر الدم ، وامراض القلب ، ارتفاع كلسترول الدم ، زيادة عدد الصفيحات الدموية ، وارتفاع خضاب الدم .

كما أوصت الدراسة باجراء دراسات أخرى على مستوى الوطن، ومتابعة المرضـــى مـــن ناحية فحص سريري ومخبري .