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Blood Profile of Schizophrenic Clients in Northern Palestine

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الإهداء

إلى كل فلسطيني أحب ثرى الوطن

إلى روح الرسول محمد عليه الصلاة والسلام

إلى أرواح الأنبياء عليهم الصلاة والسلام

إلى الشهداء والأسرى والجرحى

إلى والداي أدامهم الله

إلى أخي وأخواتي

إلى زوجتي و ابنتي الغاليتين

إلى زملائي الممرضين والممرضات

والى أصدقائي الأوفياء في كل مكان

إلى الجميع اهدي عملي هذا

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الإقرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان :

Blood profile of schizophrenic clients in northern Palestine

أقر بأن ما اشتملت عليه هذه الرسالة إنما هي نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وأن هذه الرسالة ككل، أو أي جزء منها لم يقدم لنيل أية درجة أو لقب علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى .

Declaration

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's Name : **اسم الطالب :**

Signature : **التوقيع:**

Date: **التاريخ:**

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List of Abbreviations

Abbreviation	Full Name
APA	American Psychiatric Association
BMI	Body Mass Index
DALYs	Disability Adjusted Life Years
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders fourth edition-Text revision
EOS	early-onset schizophrenia
GRAN	Granulocyte
HCT	Hematocrit
HG	Hemoglobin
MCH	mean corpuscular hemoglobin
MCHC	mean corpuscular hemoglobin concentration
MCV	Mean Corpuscular Volume
MOH	Ministry of Health
NGOs	non-governmental organizations
NIH	National Institutes of Health
OPT	occupied Palestinian territory
PLT	Platelets
PTSD	post-traumatic stress disorder
PUFA	polyunsaturated fatty acids
RBC	Red Blood Cell
CSSBs	Consumption of sugar-sweetened beverages
UNRWA	United Nations Relief and Works Agency
WBC	White Blood Cells
WC	Waist Circumference
WHO	World Health Organization

Blood Profile of Schizophrenic Clients in Northern Palestine

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Abstract

Background: People with schizophrenia die prematurely because antipsychotic medications and patients' lifestyle, contribute to excess morbidity and mortality in these patients. Hematological side effects of antipsychotic drugs such as leucopenia, neutropenia, agarnulocytosis, leukocytosis, thrombocytopenia, thrombocythaemia and anemia occur infrequently but remain a potential cause of serious toxicity and people with schizophrenia make poor dietary choices. Complete blood count is one of the measures to investigate these morbidities and mortalities.

Objectives: The objective of this study was to investigate the blood profile and general characteristics in a group of schizophrenic patients in Northern West-Bank, Palestine.

Methods: A cross sectional study was conducted between August 2011 and February 2012 at the governmental primary psychiatric health care centers in Northern West-Bank, Palestine. Two hundred and fifty patients were selected by convenience sampling method. A complete blood count (CBC) was performed on blood samples collected from the selected patients to investigate the white and red blood cells, as well as platelet count.

Results: The number of schizophrenic patients having anemia in our study was 63 (25.2%). Regression analysis showed that gender was significant factor associated with the prevalence of anemia in schizophrenic patients, the prevalence of female patients they have anemia more than male patients. The majority of patients had normal white blood cells and platelets counts.

Conclusion and recommendation: Anemia was found among 25.2% of study population in schizophrenic patients as result of poor nutritional status, unhealthy life style of these patients, and antipsychotic drugs. It is recommended that mental health providers deliver patients with an appropriate community-based intervention strategy for prevention, detection and treatment of anemia. Furthermore, the low educational achievement among participants makes education a potentially important area for interventions targeted at this group. Lastly, the job skills of patients should be improved.

CHAPTER 1

INTRODUCTION

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1.1 Overview and Background:

In the area of North West Bank, where the study took place in, Tulkaram, Qalqilia, Nablus and Jenin; mental health clinics are responsible for the largest burden of the work due to the lack of centers specialized in the treatment of this group of people. Mental health providers are responsible for supervision, regulation, licensure and control of the whole health services.

Ministry of Health (MOH) is considered one of the main four providers of primary mental health in Palestine. The other three providers are: The United Nations Relief and Works Agency (UNRWA), health services belonging to national and international non-governmental organizations (NGOs), and some private health sector organizations.

1.2 Introductions

Mental and behavioral disorders are not exclusive to any special group: they are found in people of all regions, all countries and all societies. About 450 million people suffer from mental disorders according to estimates given in WHO's World Health Report 2001. One person in four will develop one or more mental or behavioral disorders during their lifetime (WHO, 2001). Mental and behavioral disorders are present at any point in time in about 10% of the adult population worldwide.

In 2004, 22.8% of the total burden of disease in the UK was attributable to mental disorder (including self-inflicted injury), compared with 16.2% for cardiovascular disease and 15.9% for cancer, as measured by Disability Adjusted Life Years (DALYs) (WHO, 2008).

There are no previous studies in Palestine with regard to complete blood count for schizophrenic patients. This is the first study of its kind to be carried out in Palestine assessing the complete blood count of schizophrenic patients.

Schizophrenia does not affect mental health only; patients with a diagnosis of schizophrenia die 12−15 years before the average population, with this mortality difference increasing in recent decades. Thus, schizophrenia causes more loss of lives than do most cancers and physical illnesses. Although some deaths are suicides, the main reason for increased mortality is related to physical causes, resulting from decreased access to medical care and increased frequency of routine risk factors (poor diet, little exercise, obesity, and smoking) (Saha et al. 2007).

Hematological indices refer to various parameters found in the human blood, which are evaluated with the aid of a Complete Blood Count (CBC). CBC is a series of test employed to evaluate the composition and concentration of the cellular components of blood. It consists of the following tests: red blood cell count, total and differential white blood cell count, platelets count and Red blood cell indices (Saunders et al. 2001).

A complete blood count is a common blood test performed to measuring the types of blood cells that are in your blood and how many appear. This test also reveals if your blood shows signs of infection, dehydration, anemia, and more (Jennifer, 2011).

A low result of red blood cells can indicate to blood loss, problems with the bone marrow, leukemia and malnutrition. High results can indicate heart problems, kidney disease, and dehydration (Jennifer, 2011).

A low count of white blood cells can indicate to bone marrow problems, autoimmune disease, and problems with the liver or spleen. High levels can indicate the presences of tissue damage (burns), leukemia and infectious disease (Jennifer, 2011).

A low hematocrit levels can indicate anemia, blood loss, bone marrow problems, malnutrition and more. High levels can indicate dehydration, polycythemia vera, and smoking (Jennifer, 2011).

A low level of platelets count may indicate the person is receiving chemotherapy, hemolytic anemia, leukemia or a recent blood transfusion. High levels can be caused by anemia, specific types of cancer, polycythemia vera, a recent surgery to remove the spleen and other health issues (Jennifer, 2011).

Anemia has been shown to be a risk factor for left ventricular hypertrophy (LVH) as well as de novo and recurrent congestive heart failure (Foley et

al. 1996). A lower hematocrit is also a risk factor for all-cause mortality in patients with left ventricular dysfunction (Al-Ahmad et al. 2001). Anemia has not, however, been evaluated as a risk factor for cardiovascular disease (CVD) in low-risk patients in the general population.

So that, the mental health nurses assessing mental status, blood investigation, tardive dyskinesia, developmental of neuroleptic malignant syndrome, and blood pressure for the patients (nursing guide, 2012).

The risk factors for poor mental health in adulthood include unemployment, stressful life events (Melzer, 2004), violence (Bebbington et al. 2004), and inadequate housing (McManus et al. 2009).

Major socioeconomic and environmental determinants for mental health are related to macro issues such as poverty, war and inequity. Patients often lack adequate food, shelter, education and health; deprivations that keep them from leading the kind of life that everyone values (World Bank, 2000). Populations living in poor socio-economic circumstances are at increased risk of poor mental health, depression and lower subjective wellbeing (Patel and Jané-Llopis, 2005).

1.2.1 Definition of schizophrenia

Mental illness refers to diagnosable mental disorders that are characterized by alterations in thinking, mood, or behavior associated with distress and/or

impaired functioning (United States Department of Health and Human Services, 1999).

Schizophrenia is a psychotic disorder that causes severe mental disturbances that disrupt thought, speech, and behavior, Despite its devastating effect on people who suffer from it, schizophrenia is difficult to diagnose with a broad range of symptoms that a schizophrenic patient might display (Heather Barnett, 2007).

Schizophrenia is characterized by three semi-independent symptom domains: positive symptoms, such as auditory hallucinations, delusions, and thought disorder; negative symptoms, including anhedonia, social withdrawal, affective flattening, and demotivation; and cognitive dysfunction, particularly in the domains of attention, working memory, and executive function (Tamminga, 2005).

According to the American Psychiatric Association (APA) schizophrenia diagnosed based on the Diagnostic and Statistical Manual of Mental Disorders fourth edition-Text revision (DSM-IV-TR), the three following diagnostic criteria must be met:

a- Characteristic symptoms: Two or more of the following, each present for most of the time during a one-month period (or less, if symptoms remitted with treatment).

- Delusions.
- Hallucinations.
- Disorganized speech, which is a manifestation of formal thought disorder.

- Grossly disorganized behavior (e.g. Dressing inappropriately, crying frequently) or catatonic behavior.
- Negative symptoms: Blunted affect (lack or decline in emotional response), alogia (lack or decline in speech), or avolition (lack or decline in motivation).

If the delusions are judged to be bizarre, or hallucinations consist of hearing one voice participating in a running commentary of the patient's actions or of hearing two or more voices conversing with each other, only that symptom is required above. The speech disorganization criterion is only met if it is severe enough to substantially impair communication.

b- Social or occupational dysfunction: For a significant portion of the time since the onset of the disturbance, one or more major areas of functioning such as work, interpersonal relations, or self-care, are markedly below the level achieved prior to the onset.

c- Significant duration: Continuous signs of the disturbance persist for at least six months. This six-month period must include at least one month of symptoms (or less, if symptoms remitted with treatment).(APA, 2000)

1.2.2 Epidemiology

Schizophrenia has a prevalence of one percent in all cultures and is equally common in men and women (Diagnostic and Statistical Manual of Mental Disorders, 2000). Men typically present with the disease in their late teenage years or early 20s, whereas women generally present in their late 20s or early 30s.

While the lifetime risk in the general population in just below 1%, it is 6.5% in first-degree relatives of patients, and it rises to more than 40% in monozygotic twins of affected people (Cardno et al. 1999).

Onset of symptoms typically occurs in early adult life (average age 25 years), and occurs earlier in men than in women (Aleman et al. 2003).

1.2.3 Etiology

Risk factors for schizophrenia includes; family history, obstetric complications, developmental difficulties, central nervous system infections in childhood, the use of cannabis, and acute life events. (McGrath, 2006).

1.2.4 Types of schizophrenia

There are five types of schizophrenia: paranoid, disorganized, catatonic, undifferentiated, and residual. Paranoid type is characterized by a preoccupation with one or more delusions or frequent auditory hallucinations. Disorganized type is characterized by disorganized speech and behavior, as well as flat or inappropriate affect. Catatonic type has at least two of the following features: immobility (as evidenced by stupor or catalepsy); excessive, purposeless motor activity; extreme negativism. A patient is said to have undifferentiated schizophrenia if none of the criteria for paranoid, disorganized, or catatonic types are met. Residual type is characterized by the continued presence of negative symptoms (e.g., flat

affects, poverty of speech) and at least two attenuated positive symptoms (e.g., eccentric behavior, mildly disorganized speech, odd beliefs). A patient is diagnosed with residual type if he or she has no significant positive psychotic features (Diagnostic and Statistical Manual of Mental Disorders, 2000).

1.2.5 Treatment of schizophrenia

Management of schizophrenia depends largely on medications and on psychosocial interventions. No single approach is widely considered effective for all patients, though in the United States and most Western countries, psychiatric medication is often the primary method of treatment. Currently, there is a movement towards utilizing a recovery model that emphasizes hope, empowerment and social inclusion, though this is not yet a mainstream mental health concept (Bellack, 2006).

The mainstay of psychiatric treatment for schizophrenia is antipsychotic medication these can reduce the "positive" symptoms of psychosis (The Royal College of Psychiatrists & the British Psychological Society, 2003). Most antipsychotics are thought to take around 7–14 days to have their main effect.

Treatment of schizophrenia changed dramatically in the mid 1950s with the development and introduction of the first antipsychotic (typical antipsychotic) chlorpromazine. Others such as haloperidol and trifluoperazine soon followed (Turner, 2007).

The two classes of antipsychotics (typical and atypical antipsychotics) are generally thought equally effective for the treatment of the positive symptoms. Some researchers have suggested that the atypical offer additional benefit for the negative symptoms and cognitive deficits associated with schizophrenia, although the clinical significance of these effects has yet to be established. Recent reviews have refuted the claim that atypical antipsychotics have fewer extrapyramidal side effects than typical antipsychotics; especially when the latter are used in low doses or when low-potency antipsychotics are chosen (Leucht et al. 2003).

1.3 History of mental health services in Palestine

Mental health was particularly neglected in Palestine. While the Palestinian Ministry of Health, with support from the World Health Organization (WHO), is continuing to attempt to expand services beyond the hospital, most services continue to be hospital-based, fragmented and rooted in a biomedically oriented approach (WHO, 2006).

Whilst the history of mental illness in European societies was characterized by condemnation and exclusion, Arab societies had a long tradition of caring for the mentally ill in hospitals and within communities (Murad and Gordon, 2002). Until the early twentieth century, the primarily responsible for mentally ill people rested with families.

In Palestine, the British administration opened a governmental mental hospital in Bethlehem in 1922 and established a system ‘to admit lunatics to asylums’ (Government of Palestine, 1922).

With the military occupation of the West Bank and Gaza Strip in 1967, Israel became responsible for the health and welfare of the population there. Yet, the Israel Mental Health Act was not applied to the occupied Palestinian territory (oPt) until the late 1970s, when limited psychiatric outpatient services were provided to the population under military occupation (State of Israel, Ministry of Health, 1985).

However, in the context of the first Palestinian uprising (First Intifada), in the late 1980s, and the accompanying media attention to Israeli military violence, the emphasis on psychological ‘trauma’ increased, and subsequently became a major concern of international mental health initiatives. Terms like ‘post-traumatic stress disorder, PTSD’, ‘psychosocial’ and ‘counseling’ rapidly became points of reference in this new realm of humanitarian concern (Summerfield, 1999).

While international agencies adopted western-designed trauma programs as a core treatment model in the occupied Palestinian territory, Palestinians themselves continued to rely on family support and community intervention (Giacaman, 2004).

The following table shows the incidence rate of reported new cases of mental disorders in the occupied Palestinian territory per 100,000 inhabitants in the years from 2001-2005(PHIC, 2006). (Table 1.1)

Mental disorder	**2001**	**2005**
Schizophrenia	7.3%	9.3%
Mental retardation	6.8%	13.4%
Epilepsy	7.5%	10.4%

1.4 Problem statement

People with schizophrenia die prematurely 12−15 years before the average population, with this mortality difference increasing in recent decades. Thus, schizophrenia causes more loss of lives than do most physical illnesses. Although the main reason for increased mortality is related to physical causes, resulting from decreased access to medical care and increased frequency of routine risk factors (poor diet, little exercise, obesity, and smoking) .

1.5 Significance of the study

Patients with schizophrenia are neglected, not unlike patients diagnosed with other chronic mental illnesses, are often unemployed, have limited access to health care, live in suboptimal conditions and their physical and mental health is often compromised(Gilbody and Petticrew, 1999). Therefore, their physical health and nutritional status may be impaired. Those, medication used by schizophrenic patients affect their blood profile; numerous side effects are documented in association with the use of antipsychotic drugs and continue to be matters of concern (Hansen et al. 1997). One potentially fatal, albeit uncommon, side effect involves abrupt falls in circulating neutrophil leucocytes numbers. Such antipsychotic-induced agranulocytosis has a frequency of around 1% per annum, varying from one drug to another (Atkin et al. 1996). Therefore, this study investigates the physical health, particularly blood profile of those patients.

1.6 Objectives of the Study

To investigate the blood profile and general characteristics in a group of schizophrenic patients in Northern West- Bank, Palestine.

1.7 Research Questions and Hypotheses:

1. Do Schizophrenic patients have normal complete blood count?

2. Does their life style have an effect on complete blood count?

3. Are schizophrenic patients within a normal body mass index?

Chapter 2
Theoretical framework and Literature Review

2.1Introduction

2.2Effects of the age of onset on the clinical characteristics of schizophrenia

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2.6 Schizophrenia and antipsychotic drugs

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2.1 Introduction

Schizophrenia is a chronic, severe, and disabling brain disorder that has affected people throughout history. About 1 percent of Americans have this illness (Regier et al. 1993).

Schizophrenia rarely occurs in children, but awareness of childhood-onset schizophrenia is increasing (Nicolson et al. 2000).

Schizophrenia is a disabling group of brain disorders characterized by symptoms such as hallucinations, delusions, disorganized communication, poor planning, reduced motivation, and blunted affect. (McGrath et al. 2004).

Researchers have observed that the prevalence of mental health disorders has increased in developed countries in correlation with the deterioration of the Western diet (Young SN, 2002). Previous research has shown nutritional deficiencies that correlate with some mental disorders (Young SN, 2007).

2.2 Effects of the age of onset on the clinical characteristics of schizophrenia

A number of studies have suggested that women in general may have a later age of onset and an overall lower severity of schizophrenia, suggesting a protective effect of estrogens (Hafner, et al., 1998). Several negative predictors of outcome in schizophrenic patients have been

identified including male sex (Lindstorm, 1996), early and non-acute onset of syndromes (Ciompi, 1988), the prevalence of negative symptoms, (Tamminga, 1998) the presence of affective symptoms, (Eaton, et al., 1998) poor pre-morbid functioning, (Robison, 1999), and a delay in starting pharmacological treatment (De Quardo, 1998).

Schizophrenic clients with earlier ages of onset are more likely to be males and have: poor pre-morbid adjustment, lower educational achievements, more evidence of structural brain abnormalities, more prominent negative symptoms, more cognitive impairment, and a worse overall outcome, (APA,1994) as well as a higher likelihood of having relatives with schizophrenia (Sham, 1994).

The onset of schizophrenia prior to age 13 is exceedingly rare (Rapoport, 1999), but an estimated 39% of males and 23% of females with schizophrenia develop the illness by the age of 19 (Loranger, 1984).

Patients with early-onset schizophrenia (EOS; onset by age 18) (Vourdas, 2003), shows a number of similar neurobiological abnormalities observed in adult-onset schizophrenia, and suggest the involvement of a common neurobiological substrate (Vourdas et al. 2003, and Kravariti et al. 2003). However, compared to patients with adult-onset schizophrenia, an early onset of schizophrenia appears to be associated with higher rates of pre-morbid abnormalities, (Vourdas et al. 2003 and Nicolson et al. 2000) worse

cognitive performance, (Hoff et al. 1996) and worse functional outcomes (Hollis, 2000).

2.3 Schizophrenia and life style

A drift down the social scale associated with unemployment and poorer financial standing once the illness is established is not unusual. It is also hypothesized that an `` risk factor' operates in the etiology of schizophrenia, increasing its incidence (Jablensky, 1999).

Two fairly studies (Brown et al. 1999; McCreadie, 2003) have compared the lifestyle of people with schizophrenia living in the community with that of low social class cohorts from existing general population studies of lifestyle habits. In both studies, people with schizophrenia made significantly poorer dietary choices, did less exercise and smoked more heavily than the comparator groups in the general population. Given that poor diet, smoking and excess weight are potentially modifiable factors associated with increased physical morbidity and mortality.

2.4 Schizophrenia and medical illness

People with schizophrenia have a higher risk of medical illness than does the general population. They also have an increased (by two- to fourfold) relative risk of premature death, dying at least 10 years earlier than age-matched contemporaries (Brown, 1997, and Joukamaa et al 2001).

Moreover, people with schizophrenia have a substantially increased risk for medical comorbidities, excess mortality (Hannerz, 2001, and Kelly, 2007) and have a higher prevalence of cardiovascular disease, contributing to the mortality rates (Tsuang, 1983, and Harris, 1988). In comparison to the general population, schizophrenic clients are more likely to make poor dietary choices, smoke and do less exercise (McCreadie, 2003).

2.5 Schizophrenia and mortality

The mortality risk in this population is over twice that of the general population (Saha, 2007), resulting in about a 15-year reduction in average life span in people with schizophrenia (Newman SC, Bland RC.1991).

Early studies reported that increased mortality was due to a high rate of suicide (Allebeck, 1989, and Black, 1985).

The majority of excess mortality among persons with schizophrenia appears to be due to cardiovascular complications, notably coronary heart disease (Hennekens et al. 2005). Individuals diagnosed with schizophrenia have a significantly greater 10-year risk of developing cardiovascular disease as compared with the general population for both males (9.4% versus 7.0%) and females (6.3% versus 4.2%) (Goff et al. 2005). A recent report notes that standardized mortality ratio for cardiovascular death is about three times greater in people with schizophrenia than the general population (Kelly et al. 2010).

2.6 Schizophrenia and antipsychotic drugs

Anti-psychotic agents constitute a class of drugs used to treat psychotic disorders as well as other mental and emotional conditions, which are primarily composed of major tranquilizers (Ford-Martin, 2004).

For almost 50 years, medication with anti-psychotic drugs has been the standard treatment for people diagnosed as schizophrenic. The number of patients undergoing treatment with these drugs is high as the lifetime risk of developing schizophrenia is around 0.7–0.9% (Jablenski, 1986), and once diagnosed patients are routinely maintained on anti-psychotic medication indefinitely as a prophylactic measure (APA, 1997).

Varieties of anti-psychotic medications are currently in use, including both typical and atypical formulations (King and Wager, 1998). Moreover, as shown by several studies (Johnson and Wright, 1990; Kiivet et al. 1995), poly-pharmacy may be widespread, with patients being maintained on more than a single anti-psychotic.

Hematological side effects of neuroleptic drugs occur infrequently but remain a potential cause of serious toxicity (Balon, 1987). An understanding of the pathogenesis of hematological dyscrasias is essential for their effective management (Patton & Duffull, 1994). The side effect profile of traditional or typical neuroleptic agents has been a highly limiting factor during acute and chronic treatment but hematological effects are rare (Casey, 1996). Although the risk from most drugs is very small but it may

affect peripheral blood cells and bone marrow. Neutropenia, leukocytosis and anemia are the common side effects (Lubran, 1989). They are disorders characterized by decreased hemoglobin, which is frequently accompanied by decreased red cell count. The diagnostic hypothesis of microcytic anemia is based on complete blood cell count (CBC) results. Discordant properties of the red blood cell (RBC) have been exploited to differentiate the two most common types of microcytic anemia, iron deficiency anemia and heterozygous thalassemia. Deficiency of iron is probably the most common cause of microcytic anemia throughout the world (Simeon, 1999).

Clozapine as antipsychotic drug is associated with various hematological adverse effects, including leucopenia, neutropenia, agarnulocytosis, leukocytosis, anemia, eosinophilia, thrombocytopenia and thrombocythaemia (Herceg, 2010). Increased incidence of mortality caused by cardiovascular disease (Brown, 1997) and the increased risk of thrombotic complication in schizophrenic patients treated with antipsychotics has been reported. Aggregation of blood platelets, the smallest blood cells that play an important role in homeostasis, has a major role in the clinical complications of arteriosclerosis (myocardial infarction, ischemic stroke) (Allebeck, 1989; Ruschena et al. 1998).

2.7 Schizophrenia and Diet

Studies have demonstrated that people with schizophrenia make poor dietary choices, prefer a high fat diet and consume fewer vegetables (McCreadie, 2003). The dietary intake of people with schizophrenia may be as poor as the social class, with the high fat content contributing further to dyslipidemia and weight gain.

People with schizophrenia die early, especially from cardiovascular disease (Mortensen & Juel, 1993), which is associated with a low intake of fruit and vegetables (Gillman, 1996). It has been previously shown that people with schizophrenia make poor dietary choices (McCreadie et al. 1998), and concluded that assertive programs to improve their eating habits were necessary. Advice to the general population to improve fruit and vegetable intake has been shown to be successful, at least in the short term (Zino et al. 1997).

While it is well recognized that the pattern of food intake is of substantial importance in the etiology of physical diseases such as diabetes, cancer, and cardiovascular disease and in the view of the clinical and epidemiological association between these mental and physical illnesses, it is surprising that there has been little research finding in the relationship between nutrition and mental illness (Peet, 2004; Ryan, Thakore, 2002; Tucker , Buranapin, 2001).

On the other hand, some physical illnesses, particularly diabetes and coronary heart diseases, occur with increased frequency in patients with schizophrenia and major depression (Peet, Edwards, 1997; Ryan, Thakore, 2002).

Peet (2004) compared the existing database on international variations in the outcome of schizophrenia and showed that more intakes of refined sugar, meat, eggs, and with a lesser degree dairy products and alcohol, was associated with a greater prevalence of depression and poor outcome of schizophrenia. There was a negative (beneficial) relationship between pulses, fish and seafood intake and severity of schizophrenia (expressed as hospital admission and social outcome) and prevalence of depression, respectively (Peet, 2004). Previously, Christensen and Christensen (1988) showed that there is a very strong correlation between a low percentage of total dietary fat and fat from land animals and birds (mainly saturated fats) and a good prognosis of schizophrenia while a high percentage of dietary unsaturated fatty acids were less strongly associated .

In his review, Peet concluded that high saturated fats, high glycemic load, and low omega-3 polyunsaturated fatty acids (PUFA) might be detrimental for the symptoms of schizophrenia (Peet, 2004)

During the last decade, evidence has emerged to confirm that the diet and lifestyle of individuals with schizophrenia are unhealthy in comparison to the general population. A study of 102 community-dwelling individuals

with schizophrenia in Scotland found unhealthy dietary habits, particularly in men (McCreadie et al. 2003). This study found fewer men consumed the recommended intake of fruit and a vegetable compared to the general population and with the poorest diets was the lower social class living in Scotland.

A similar UK study of schizophrenia patients living in supervised mental health housing also found that no one had a daily intake of five portions of fruit or vegetables, as is recommended (Brown et al. 1999). In another study of 146 outpatients with schizophrenia who were obese (mean body mass index [BMI] 32.8), patients were found to eat a similar diet to the general population, but they consumed significantly more calories (Strassnig et al. 2003). In summary, the nutrition of schizophrenia patients tend to be characterized by a relative lack of fruits, vegetables and fibers and an excess of calories and saturated fat.

2.8 Schizophrenia and Obesity

It is known that patients with schizophrenia in North America tend to be overweight (Allison et al. 1999). Obesity itself is widely regarded as a major medical hazard (National Task Force on the Prevention and Treatment of Obesity, 2000) and is increasing in prevalence (Mokdad et al. 1999). The risks include insulin resistance, diabetes mellitus, and hypertriglyceridemia, decreased levels of high-density lipoprotein cholesterol, and increased levels of low-density lipoprotein cholesterol.

While the etiopathogenesis of weight gain in schizophrenia remains unclear, there is consensus that obesity is primarily a result of poor dietary choices (Brown et al. 1999). There are only a handful of studies that have systematically examined the diet of patients with schizophrenia. In a nutritional assessment among people living in "mental health residential houses" in Sydney, Australia, it was observed that the respondents had a significantly higher prevalence of obesity (including abdominal obesity) than the general population (Wallace and Tennant, 1998). In studies completed in Scotland and Oxford, U.K., it was observed that schizophrenia patients' diet was higher in fat and lower in fiber and vitamins as compared to the healthy controls' diet (McCreadie et al. 1998; Brown et al. 1999).

Although often not viewed as a health problem, being overweight or obese has reached epidemic proportions worldwide. Excessive body weight substantially increases the risk of morbidity from a number of conditions, including hypertension, dyslipidaemia, type II diabetes mellitus, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea, respiratory problems and endometrial, breast, prostate and colon cancers. Higher body weight is associated with increased mortality as well as with social stigmatization (Meltzer & Fleischhacker, 2001).

Poor or inappropriate dietary habits increase the risk and/or incidence of chronic disease among adolescents. Of greatest concern is the increasing rate of obesity and obesity-related health risks, such as diabetes and

cardiovascular disease. The prevalence of type 2 diabetes among adolescents has increased and is closely linked to overweight and obesity (The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity. 2007).

Excess abdominal fat is associated with dyslipidaemia, hypertension and glucose intolerance. Risk of comorbid diseases has been shown to rise as BMI increases above 25 kg/m2 and waist circumference increases above 102 cm for men or 88 cm for women (Aronne, 2001). Increased rates of diabetes have also displayed a relationship to body fat distribution (Ryan & Thakore, 2002).

In psychiatric practice, weight gain is a long recognized and commonly encountered problem. In a literature review, Allison & Casey (2001) reported a study that used the 1989 US National Health Interview Survey data comparing weights and heights of people with and without schizophrenia. In general, the results of the mentioned study showed that people with schizophrenia were more obese than those without, with a significant difference for women.

It is reported that the Body Mass Index (BMI) correlates with body fat, morbidity and mortality, while waist circumference indicates the abdominal fat distribution (Aronne, 2002).

People with severe mental illness have been shown to be more overweight (BMI ≥25), obese (BMI ≥ 30), and have poorer nutritional status than the general population (Davidson et al. 2000, Wallace, Tennant, 1998).

2.9Schizophrenia and Smoking

Smoking is more prevalent in the schizophrenia population than in the general population. It has been estimated that around 70% of individuals with schizophrenia currently smoke (McCreadie et al. 2003; Susce et al. 2005), and only 14% have never smoked. Schizophrenic smokers also consumed fewer portions of fruit and vegetables per week than non-smoking patients (McCreadie et al. 2003).

The prevalence of smoking in schizophrenia greatly exceeds that in the general population (75– 92% v. 30–40%). Furthermore, heavy cigarette smoking is intimately associated with schizophrenia and it may have implications for the underlying neurobiology of the disease. Patients, who smoke report increased cigarette consumption, are more addicted to nicotine and have higher nicotine levels in the bloodstream. Smoking may be a marker for a more severe illness. Cigarette smoking induces hepatic microsomal enzymes, which increase the metabolism of psychotropic medication; therefore, smokers usually require greater levels of antipsychotic medication than non-smokers to achieve similar blood levels (Kelly & McCredie, 2000).

Most heavy smokers find it very difficult to give up, and success rates are even lower in people with psychiatric illness. Attempts to get patients with schizophrenia to stop smoking have been met with variable success. It is widely believed (by mental health professionals, families, careers and patients themselves) that it is one of the patients' few pleasures, that it is 'hopeless' to try to quit and that to do so will aggravate their mental state. This view is discriminatory. In a survey of cigarette-smoking patients, one-third reported that they wanted to quit for health reasons. Clearly, smokers with schizophrenia have a severe nicotine addiction, and pharmacological and psychological support with cessation needs to address their particular needs (Kelly & McCredie, 2000).

2.10 Schizophrenia and Physical activity

Brown et al (1999) and McCreadie (2003) found that people with schizophrenia tended to take only small amounts of exercise. The reason for this has not been demonstrated, but factors such as features of the illness, sedative medication and lack of opportunity and general motivation may be relevant.

The relative risk of atherosclerosis in physically inactive individuals is higher than in those who are more active. The specific mechanism by which physical activity reduces mortality from cardiovascular disease is unknown, but exercise has been shown to improve lipid profiles, glucose tolerance, obesity and hypertension.

2.11 Conceptual framework

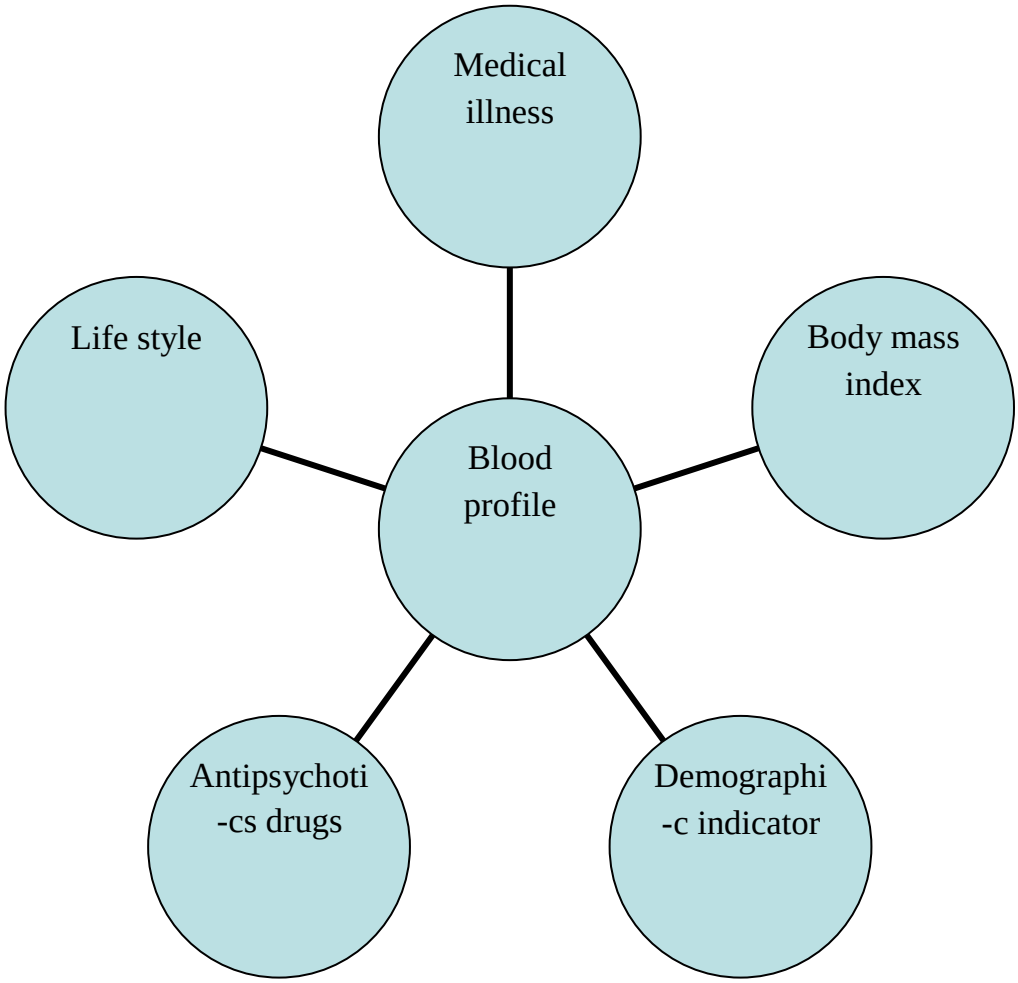

Figure 2.1: Factors that affect on blood profile for schizophrenic patients.

Chapter 3
Research Methods

3.1 Introduction

3.2 Study Design

3.3 Study setting

3.4 Study population

3.4.1 Inclusion Criteria

3.4.2 Exclusion Criteria

3.5 Sample size estimation and sampling method

3.6 Data collection

3.7 Validity of data sheet

3.8 Ethical considerations and accessibility

3.9 Tested variables

3.10 Data analysis

3.11 Summary

3.1 Introduction

This chapter is devoted to specify the steps and the methodology taken in carrying out the research endeavor. In this chapter, I will present the Study design, setting of the Study, Study Population, inclusion and exclusion criteria, Sample size and Sampling Method, data collection, Tested variables, and ethical considerations.

3.2 Study Design

A cross sectional study was conducted between August 2011 and February 2012.

Cross-sectional studies form a class of research methods that involve observation of all of a population, or a representative subset, at one specific point in time. Cross-sectional studies are descriptive studies (Carsten and Thomas, 2008).

3.3 Study setting

The study was conducted in governmental primary psychiatric health care centers located throughout the Northern West Bank, Palestine. The centers included in the study were those in Nablus, Jenin, Tulkaram, and Qalqilia.

3.4 Study population

The sample study was two hundred and fifty four diagnosed as schizophrenic patients based on DSM- IV attending mental health clinics in the Northern West Bank.

All attending patients were invited to participate in the study.

3.4.1 Inclusion Criteria

All schizophrenic patients attending the governmental Psychiatric Health centers in Northern West Bank during the study period (August 2011 and February 2012) were invited to participate. Any patient who fulfilled the following inclusion criteria was included in the study:

1. The patient was diagnosed with schizophrenia according to defined of DSM-IV (more than six month).
2. Their age was 16 years old and above.

3.4.2 Exclusion Criteria

Patients who had the following characteristics were excluded from the study:

1. Newly diagnosed with schizophrenia according to DSM- IV(less than six month).

2. Their age was less than 16 years old.

3.5 Sample size estimation and sampling method

A convenience, non-probability, sampling method was adopted. All schizophrenic patients' based on inclusion criteria attendants of the governmental psychiatric clinics in the Northern West Bank were invited to participate in the study. Two hundred and fifty four diagnosed as

schizophrenic patients attending mental health clinics invited to participating in the study, but two hundred and fifty patients included in the study based on inclusion criteria.

Convenience sampling is a type of non-probability sampling which involves the sample being drawn from that part of the population, which is close to hand. That is, a sample population selected because it is readily available and convenient. The researcher using such a sample cannot scientifically make generalizations about the total population from this sample because it would not be representative enough (Powell and Ronald, 1997).

3.6 Data collection

Data was collected through two means. Firstly, an assessment sheet was developed to collect personal information, this information that collected from patients or their families, and patient's charts. This sheet consisted of two sections; the first section covered the demographic information of the patients including gender, age, and place of residence, education, marital status, occupation, and smoking status. The second section covered clinical characteristics and history including information regarding their body mass index, waist circumference, duration of illness and number of times of hospitalizations due to their psychiatric illness. Secondly, take blood sample from patients to investigate complete blood count results, which included information regarding the white and red blood cells, as well as

platelet count. The red cell results included red blood cells count, hemoglobin, hematocrit, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC). The white blood cell information included white blood cell count and white blood cell differential count. Platelets information was only based on total count.

3.7 Validity of data sheet

The questionnaire was drafted and presented to the supervisor: Dr.Iyad Ali, and Dr. Adham Abu Taha, then obtained on approved.

3.8 Ethical Considerations and accessibility

1. Permissions were obtained from Palestine ministry of health to access studying in psychiatric clinic, the college of Graduate Studies and Institutional Review Board (IRB) at An-Najah national University.
2. Informed consents were obtained from the patients or their families.
3. The collected data was treated with the highest level of confidentiality.

3.9 Tested variables

Dependant variables

1. **Anemia:** according to world health organization in definition of anemia, the level of hemoglobin in males is less than 13g/dl, and female less than 12g/dl (WHO, 2008).

2. **White blood cell count: based on Palestinian health data** dictionary, the level of WBC counts is $4.6 – 11*10^9$ (cell/L) for adult male and female (Palestinian ministry of health, 2005).
3. **Platelets count:** based on Palestinian health data dictionary, the level of platelets counts is $150 – 450*10^9$ (cell/L) for adult male and female (Palestinian ministry of health, 2005).
4. **Waist circumference:** The normal waist circumference for male less than 102 cm, and female less than 88 cm (Aronne, 2001).
5. **Height and weight:** measured to the participants in standing position without shoes and heavy garments and recorded to the nearest kilogram, and full cm. Electronic balance scales were used.
6. **Body mass index:** based on National Institutes of Health (NIH), 1998:

$$\text{BMI} = \frac{\text{mass(kg)}}{(\text{height(m)})^2}$$

- Normal weight with a BMI < 25 kg/m^2
- Overweight with a BMI 25-29.9 kg/m^2
- Obese with a BMI ≥ 30 kg/m^2.

Independent variables: included age, gender, education, place of residence, marital status, smoking status, duration of illness, number of

psychiatric hospitalizations, body weight and height, waist circumference, and occupation.

3.10 Data Analysis

Descriptive statistics for all study variables were computed. These descriptive statistics included frequencies and percentages for all categorical variables in addition to means, standard deviations and ranges for all continuous variables.

All statistical analyses were conducted using Statistical Package for Social Sciences (SPSS; version 18.0) for Windows. The conventional 5 percent significance level was used throughout the study.

3.11 Summary

This chapter is devoted to specify the steps and the methodology taken in carrying out the research endeavor. In this chapter, I will present the Study design, setting of the Study, Study Population, inclusion and exclusion criteria, Sample size and Sampling Method, data collection, Tested variables, and ethical considerations.

Chapter 4
Results

4.1 Demographic and clinical data of the patients

4.2 The patient’s characteristics

4.3 Body mass index for schizophrenic patients

4.4 The blood profile for patients in the study

4.5 Frequency of anemia stratified with gender

4.6 White blood cells count stratified with gender

4.7 Platelet count stratified with gender

Introduction

The purpose of this study to investigate blood profile for schizophrenic patients in Northern West- Bank, Palestine. this chapter consist of seven parts: part (1) Demographic and clinical data of the patients, part (2) The patient's characteristics, part (3) Body mass index for schizophrenic patients, part (4) The blood profile for patients in the study, part (5) Frequency of anemia related to gender, part (6) White blood cells count stratified with gender, and part (7) Platelet count stratified with gender.

4.1 Demographic and clinical data of the patients

As shown in Table 4.1, out of the 254 included patients, 250 agreed to participate in the study with a response rate of 98.4%. In this study, the number of male patients was 182 (72.8%), and of female patients was 68 (27.2%).

One hundred and forty five (58%) participants resided in villages, 84 (33.6%) resided in cities, and 21 (8.4%) resided in refugee camps. The level of education of clients was variable; the number of participants with an elementary level of education was 109 (43.6%), those with a secondary level were 104 (41.6%), and those with a diploma level were 37 (14.8%). One hundred and twelve participants were married (44.8%), 114 (45.6%) were single, and 24 (9.6%) were divorced. One hundred and ninety seven (78.8%) of participants were jobless and the number of working

participants was 53 (21.2%). Well over half of participants were smokers (n=153; 61.2%).

4.2 The patient's characteristics

The mean average age, in years, of participants was 41.9 ± 11.8, the mean body mass index was 28.4 ± 6.1 Kg/m^2 and the mean waist circumference of participants was 97.8 ± 13.4 cm. The duration of illness of participants was 15.8 ± 9.3 years and number of their hospitalization due to their psychiatric illness was 1.9 ± 3.2. Table 4-2

4.3 Body mass index for schizophrenic patients

Out of the 250 patients, 82 patients (32.8% of the total number of patients) had normal BMI values, 60 of these were males representing 84.1% and 13 were females, representing 15.9%.

A total of 55 male patients (71.4% of total clients) and 22 female patients (28.6% of total patients) had a BMI between 25-29.9 Kg/m^2, which is considered overweight. The total numbers of male and female patients who were overweight came to a total of 77 clients out of the total number of the sample 250 clients, representing 30.8% of the total study sample.

Some patients had a BMI above 30 Kg/m^2. A total of 58 male patients representing 63.7% and 33 female patients representing 36.3% of the study sample were found to have a BMI above 30 and are considered obese. The

total number of male and female patients with BMI above 30 is 91 patients, representing 36.4% of the study sample.

Based on the above findings, the percentage of schizophrenic patients suffering from being overweight and obesity was high (67.2%). Table 4-3

4.4 The blood profile for patients in the study

The mean average for hemoglobin level, hematocrit, red blood cell count, mean corpuscular volume, platelets, and white blood cells in schizophrenic patients were 13.5 ± 1.7, 40.8 ± 4.5, 5.0± 3.1, 84.3 ± 7.5, 270 ± 82.5, and 7.7 ± 2.7, respectively.

The mean average for hemoglobin level, hematocrit, red blood cell count, mean corpuscular volume, platelets and white blood cells in schizophrenic male patients were 14.1 ± 1.3, 42.6 ± 3.3, 5.25 ± 3.6, 85.8 ± 6.7, 260 ± 68 , and 7.9 ± 2.8, respectively.

The mean average for hemoglobin level, hematocrit, red blood cell count, mean corpuscular volume, white blood cells, and platelets in schizophrenic female patients were 11.8 ± 1.5, 36.2 ± 3.9, 4.51 ± 4.3, 80.5 ± 8, 7 ± 2.3, and 303 ± 11, respectively. Table 4-4

4.5 Frequency of anemia related to gender

There was a significant difference in the number of anemic patients among female compared to male participants. The number of anemic females was

38 (55.9%) and the number of anemic males was 25 (13.7%) with p. value 0.000. Table 4-5

4.6 White blood cells count stratified with gender

The majority of patients had normal WBC counts, whereas 86.2% of male and 80.9% of female patients had normal counts. A minority of patients had abnormal WBC counts, 6.1% of male and 11.8% of female patients had leucopenia. About 7.7% of male patients and 7.3% of female patients had leukocytosis. Table 4.6

4.7 Platelet count stratified with gender

The majority of patients had normal platelets counts, where 93.4% of male and 89.7% of female patients had normal counts. Minority of patients had abnormal platelets counts, 5.5% of male and 4.4% of female patients had thrombocytopenia. About 1.1% of male patients and 5.9% of female patients had thrombocytosis. Table 4.7

Table: 4.1: Demographic and clinical data of the patients

variables	Statistics
Gender	
Female	68(27.2%)
Male	182(72.8%)
Residence	
City	84(33.6%)
Village	145(58%)
Camp	21(8.4%)
Education	
Elementary	109(43.6%)
Secondary	104(41.6%)
Diploma	37(14.8%)
Marital status	
Married	112(44.8%)
Single	114(45.6%)
Divorced	24(9.6%)
Working status	
Working	53(21.2%)
Not working	197(78.8%)
Smoking	
Non smoker	97(38.8%)
Smoker	153(61.2%)

Table 4.2: The patient's characteristics

Variable	Value
Age (years)	41.9 ± 11.8
BMI (Kg/m^2)	28.4 ± 6.1
Waist Circumference (cm)	97.8 ± 13.4
Duration of illness (years)	15.8 ± 9.3
No. Hospitalizations (times)	1.9 ± 3.2

Table 4.3: Body mass index for schizophrenic patients

BMI **Kg/m^2**	**Male** **N (%)**	**Female** **N (%)**	**Total** **N (%)**	**p. value**
Acceptable (<25)	69(84.1%)	13(15.9%)	82 (32.8%)	0.01
Overweight (25-29.9)	55(71.4%)	22(28.6%)	77(30.8%)	
Obese (>30)	58(63.7%)	33(36.3%)	91(36.4%)	

Table 4.4: The blood profile for patients in the study

Variable	Total	Male	Female
HB (g/dl)	13.5 ± 1.7	14.1 ± 1.3	11.8 ± 1.5
HCT (%)	40.8 ± 4.5	42.6 ± 3.3	36.2 ± 3.9
RBC (cell/L)	5.0± 3.1	5.25 ± 3.6	4.51 ± 4.3
MCV (fl)	84.3 ± 7.5	85.8 ± 6.7	80.5 ± 8
PLATELETS (cell/L)	270 ± 82.5	260 ± 68	303 ± 11
WBC (cell/L)	7.7 ± 2.7	7.9 ± 2.8	7 ± 2.3

Table 4.5: Frequency of anemia stratified with gender

variable	Anemic clients	None anemic	p. value
Male	25(13.7%)	157(86.3%)	
Female	38(55.9%)	30(44.1%)	
Total	63(25.2%)	187(74.8%)	<0.01

Table 4.6: White blood cells count stratified with gender

Gender	**Leukopenia**	**Normal WBC**	**Leukocytosis**	**p. value**
Female	8 (11.8%)	55(80.9%)	5(7.3%)	0.315
Male	11(6.1%)	157(86.2%)	14(7.7%)	

Table 4.7: Platelet count stratified with gender

Gender	Thrombocytopenia	Normal platelets	Thrombocytosis	p. value
Female	3 (4.4%)	61(89.7%)	4(5.9%)	0.086
Male	10(5.5%)	170(93.4%)	2(1.1%)	

Chapter 5

Discussion

5.1 Discussion

5.2 Limitations of the study

5.3 Conclusion and Recommendations

5.4 Summary

Introduction

This chapter will discuss the study results and their implication. Moreover, this study was an effort to highlight on blood profile for schizophrenic patients.

5.1 Discussion

Schizophrenia is characterized by three semi-independent symptom domains: positive symptoms, such as hallucinations, delusions, and thought disorder; negative symptoms, including anhedonia, and social withdrawal; and cognitive dysfunction, particularly in the domains of attention, working memory, and executive function (Tamminga, 2005).

Anti-psychotic drugs have been the standard treatment for patients diagnosed as schizophrenic. However, antipsychotic drug is associated with various hematological adverse effects, so that CBC is a routine laboratory test that provides information about the presence of anemia, and when it is present, the CBC contains important information regarding its cause, and this can help in formulating a differential diagnosis and directing further evaluation. White blood cell and platelet count levels may provide practitioners with information that would allow them to consider or dismiss underlying conditions of schizophrenia (Walters, Abelson, 1996).

The objectives of this study to investigate the blood profile in a group of schizophrenic patients in northern Palestine.

The majority of participants were male patients while other studies showed equal incidence of schizophrenia among male and female patient. However, this is not an incidence study and it was not the objective of the investigator to determine the prevalence of schizophrenia in the Palestinian population.

The low educational achievement among participants makes education a potentially important area for interventions targeted at this group. The rate of unemployment was significantly high and improvement in job skill levels is an important goal for persons with schizophrenia.

Despite the fact that an urban place of birth has been identified as a risk factor for schizophrenia (Harrison et al. 2003), most of the participants were from rural areas.

Most of the participants in our study were smokers (61.2%). Studies showed a strong association between schizophrenia and smoking. (De Leon, and Diaz, 2005). Among the mentally ill, smoking prevalence is highest in patients with schizophrenia (70–80%), whereas it is 20–30% in the general population (Ziedonis et al. 2008). For example, in the United States, more than 80% of schizophrenics smoke, compared to 20% of the general population (Keltner et al. 2006).

There is currently no definitive explanation for this prevalence of smoking among schizophrenic patients (McCloughen, 2003). Several social,

psychological, and biological explanations have been proposed, but today research focuses on neurobiology (Keltner, 2006, and McCloughen, 2003).

The high rate of smoking among schizophrenics has a number of serious effects, including increased rates of mortality, increased risk for coronary heart disease, reduced treatment effectiveness, and greater financial hardship (Goff et al. 2005).

People with schizophrenia may be at risk for being overweight or obese, compared with the general population (Coodin, 2001). Our study showed that the average of scores of the BMI and waist conference for most of the patients were above normal. Antipsychotics (Gentile, 2009), poor dietary choices (McCreadie, 2003), social isolation, and self-ignorance about personal appearance, may contribute in causing weight gain in schizophrenic patients (Jill, 2010).

Schizophrenic patients have poor nutritional patterns. In particular, female patients have more percent body fat and lower dietary pattern scores compared with their healthy persons. Patients frequently consume more fat and sweet drinks (Amani, 2007). More female patients drank carbonated drinks but fewer consumed milk, vegetables, nuts, and sausages in accordance to daily servings.

In comparison with female patients, more men ate eggs, vegetables, cream and chocolate, but fewer ate tuna fish servings. All patients consumed full-fat cream and chocolate in their daily food patterns (Amani, 2007).

Schizophrenia is not a life-threatening disorder and schizophrenic patients can live with the disorder for quite some time. In our study, we found that the average duration of illness was about 16 years.

The life expectancy for individuals with schizophrenia is 57 years for men and 65 years for women; around 20% shorter than the life expectancy for the general population (Harris and Barraclough, 1998).

CBC results of participants revealed an overall prevalence of anemia similar to that in the general population. It was more prevalent in females (55.9% of females) than males (13.7% of males). The World Health Organization defines anemia as hemoglobin (Hg) less than 13.0 g/dl in men and 12.0 g/dl in women. Anemia is an indication of either dietary deficiency or underlying pathologic process or disease (WHO/UNICEF/UNU, 2001). Iron deficiency, the most common nutritional deficiency in the world, is the most common cause of anemia (Irwin and kirchner, 2001).

Factors that can lead to the development of anemia in females, in general, include diminished intake and increased demands of iron, disturbed metabolism, pregnancy and excess iron demands as in multiple pregnancies, blood loss during labor, heavy menstrual blood flow, inflammation and infectious diseases. (Dutta, 2004; Tolentino and Friedman, 2007). The presence of anemia among both male and female

patients could be attributed to poor diet choices (Davidson, 2000), antipsychotic medications (Mazaira, 2008).

Almost all classes of anti-psychotic agents have been reported to cause blood dyscrasias. The hematological adverse reactions include anemia (aplastic and hemolytic), WBC abnormalities (leukopenia, leukocytosis, agranulocytosis, and eosinophilia), and platelets abnormalities (thrombocytopenia, and thrombocytosis). Drugs can cause a variety of blood dyscrasias, e.g., by interfering with hematopoiesis in the bone marrow or damaging mature blood cells by antibodies (Stübner et al. 2004).

The majority of participants had normal WBC levels, 11.8% of female and 6.1% of male patients had leucopenia. Leukocytosis occurred in 7.3% of female and 7.7% of male patients. These WBC count abnormalities are hard to explain, because they could be due to infections or drug-induced.

A minor decrease in leucocytes occurs in up to 10% of patients treated with antipsychotics. The reduction is usually small and benign and usually does not necessitate cessation of treatment (Clinical Pharmacology Bulletin, 2005).

Clozapine is associated with various hematological adverse effects including leucopenia, neutropenia, agarnulocytosis, leukocytosis, anaemia, eosinophilia, thrombocytopenia and thrombocythaemia (Herceg M., 2010).

Several studies reported WBC abnormalities in patients taking antipsychotic medications, like olanzapine (Tolosa-Vilella, et al., 2002), risperidone (Sluys et al. 2004), and quetiapine (Oluboka et al. 2003) they induced leucopenia and neutropenia.

Most of the enrolled patients had normal platelet count, while 4.4% of female and 5.5% of male patients had thrombocytopenia. About 6% of female and 1.1% of male patients had thrombocytosis.

Thrombocytopenia induced by atypical antipsychotic is very rare and causality is difficult to establish. Few reports have been published and product information suggests thrombocytopenia occurs in less than 0.01% patients taking clozapine, and less than 0.1% of patients taking risperdone (Clinical Pharmacology Bulletin. 2005).

5.2 Limitations of the study

Our analyses had a number of limitations. First, the cross-sectional nature of this study limits the ability to establish a temporal relationship of that exposure to the development of anemia, leucopenia, leukocytes, thrombocytosis, and thrombocytopenia. Second, the possibility of inaccurate or incomplete medical chart data exists.

5.3 Conclusion and Recommendations

This is the first study of its kind to be carried out in Palestine assessing the blood profile of schizophrenic patients. This study showed similar

prevalence of anemia among patients diagnosed with schizophrenia with the general population. There is high prevalence of patients who are overweight and obese. Schizophrenic patients are often neglected, despite their need for special care. Life style is a major cause in the development of anemia and obesity among the patients group.

It is recommended that mental health providers deliver patients with an appropriate community-based intervention strategy for prevention, detection and treatment of anemia. Furthermore, the low educational achievement among participants makes education a potentially important area for interventions targeted at this group. Lastly, the job skills of patients should be improved.

5.4 Summary

This chapter will discuss the study results and their implication. Moreover, this study was an effort to highlight on blood profile for schizophrenic patients.

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Appendix

معلومات وتفاصيل البحث

مقدمة:

أخي المشارك:

إنا الممرض القانوني هشام زاهر عبد الفتاح زهران في ماجستير الصحة النفسية المجتمعية جامعة النجاح الوطنية يسرني إن ادعوك إلى المشاركة في بحثي المتعلق في صورة الدم لدى مرضى الفصام العقلي في شمال الضفة الغربية في العيادات النفسية (مراكز الرعاية الاوليه النفسية) في محافظات نابلس وطولكرم وجنين و قلقيلية لك كامل الحرية والإرادة في المشاركة في هذا البحث ولك الحق في اخذ الوقت الكافي للتفكير في المشاركة من عدمها وسؤال الباحث عما تراه مناسبا والتحدث لأي شخص أو جهة عن هذا البحث.

كما يمكنك الاستفسار عن إي جزء يتعلق في البحث ألان أو في ما بعد وإذا كانت هناك كلمات أو أجزاء غير مفهومة بإمكانك سؤال الباحث وستجد الوقت والإجابة الكافيتين يضمن البحث سرية المعلومات .

الهدف من البحث

يهف هذا البحث لدراسة معدل انتشار الخلل في صورة الدم لدى مرضى الفصام العقلي كما إن مشاركتكم ودعمكم لهذا البحث ستساهم في تطوير وتعزيز الواقع الصحي في فلسطين و الوطن العربي.

طبيعة المشاركة في البحث

بعد الموافقة على المشاركة في البحث ستكون هناك مقابلة شفوية لأخذ معلومات تتعلق بالعوامل الاجتماعية والديموغرافية والعلاج الدوائي

اختيار المشاركين

سيتم مشاركه المرضى المراجعين المشاركة طوعية واختيارية وبإمكان المشارك الانسحاب من البحث في إي وقت ودون الحاجة لإبداء الأسباب وبدون إي تبعات.

شهادة الموافقة على المشاركة في البحث

إقرار من المشاركة في البحث:

قمت بقراءة المعلومات الواردة في ورقة معلومات البحث وأتيحت لي الفرصة إن اسأل إي سؤال وقد تمت الإجابة على كافة أسئلتي بشكل كاف، وبناءا على ذلك أوقع طوعيا على المشاركة في هذا البحث.

اسم المشارك.....

توقيع المشارك.....

التاريخ.....\.....\.....

إقرار من الباحث:

قمت بقراءة المعلومات الواردة في ورقة معلومات البحث طريقة صحيحة وواضحة، وبذلت جهدي ان يعي المشارك إن البحث سيتضمن:

1. مقابلة المشارك في البحث في الاجتماعية والديموغرافية والعلاج السريري، والتاريخ الدوائي

أؤكد على إن المشارك اخذ الفرصة الكافية للإجابة على استفساراته بشكل واضح وصحيح وبذلت ما بوسعي لتحقيق ذلك.

أؤكد إن المشارك لن يجبر على التوقيع على الورقة وان مشاركته كانت بمحض إرادته وكامل اختياره.

الباحث هشام زاهر عبد الفتاح زهران .

توقيع الباحث.....

التاريخ.....\.....\.....

(يتم عمل نسختين من هذه الشهادة واحدة للباحث وأخرى للمشارك إن رغب بذلك)

Data collection sheet

Diaphragmatically Data

1. Name …….

2. Age: …….

3. Location □ City □ Village □ Camp
……..

4. Education □ Elementary □ Secondary □ Diploma □ B.A

5. Marital Status: □ Married □ Single □ Divorce

6. Smoker □ yes □ no

7. Occupation: □ employee □ labor □ non

8. Type of job: …….

9. File number in clinic……

Physical Data:

- Weight ……..
- Height ……..
- Waist circumstances: …….
- BP……..

History of Mental Illness:

1. Diagnosis ……

2. Duration of the disorder…….

3**.** How many times admitted to hospital……

Medical history for clients and family:

1. …….

2. …….

3. ……..

4. Anybody in family have problem in lipid Yes: ……

No: …….

Drug Profile:

Drug Name	Dose	Route	Frequency	Duration

Result of investigations:

Blood Profile	Result
HGB(g/dl)	
HCT (%)	
RBC(m/ul)	
MCV(fl)	
WBC(k/ul)	
PLT(k/ul)	

Important comments:

……

ورقة جمع البيانات

البيانات الشخصيه:

1- الإسم:.....
2- العمر:.....
3- مكان المعيشة : □ مدينه □ قريه □ مخيم
4- التعليم: □ أساسي □ ثانوي □ دبلوم □ بكالوريس
5- الحالة الإجتماعية: □ أعزب □ متزوج □ مطلق
6- التدخين : □ يدخن □ لا يدخن
7- العمل : □ موظف □ عامل □ لا يعمل
8- نوع العمل:.....
9- رقم الملف في العيادة النفسية:.....

البيانات الجسديه

- الوزن:.....
- الطول:.....
- محيط الخصر:.....
- ضغط الدم:.....

تاريخ المرض العقلي:

- التشخيص:.....
- مدة المرض:.....
- عدد مرات الدخول لمستشفى الأمراض النفسية:.....

تاريخ المرض الباطني للمريض وعائلته:

- .....
- .....
- هل يوجد أحد في العائلة لديه مشكلة في دهنيات الدم: □ نعم □ لا

أدوية المريض:

إسم الدواء	الجرعه	طريقة الإعطاء	التكرار اليومي	مدة أخذ الدواء

نتيجة الفحوصات:

صورة الدم	**النتيجة**
الهيموجلوبين	
الهيماتوكريت	
كريات الدم الحمراء	
حجم كريات الدم الحمراء	
كريات الدم البيضاء	
الصفائح الدموية	

تعليقات مهمة:

.....

السلطة الوطنية الفلسطينية
وزارة الصحة- نابلس
الإدارة العامة للتعليم الصحي

Palestinian National Authority
Ministry of Health - Nablus
General Directorate of Higher & Continuing Education

الرقم:
التاريخ:

Ref.: ....
Date: ....

الأخ مدير عام الرعاية الصحية الأولية والصحة العامة المحترم،،،

تحية واحترام...

الموضوع: تسهيل مهمة طلاب – جامعة النجاح الوطنية

تماشياً مع سياسة وزارة الصحة المتعلقة بتعزيز التعاون مع الجامعات والمؤسسات الأكاديمية بإتاحة فرص التدريب أمام الطلبة والخريجين والباحثين في المؤسسات الوطنية وإسهاماً في تنمية قدراتهم.

يرجى تسهيل مهمة طلاب ماجستير الصحة النفسية/ جامعة النجاح الوطنية التالية اسماؤهم بعمل مقابلات مع مرضى الصحة النفسية في عيادات (طولكرم، نابلس، قلقيلية، جنين) وسحب دم لمرضى الفصام العقلي:

Among prevalence of dyslipidemia schizophrenic client in northern West Bank	1- سامي شاكر العيويني
Blood profile of selected schizophrenic client in northern Palestine	2- هشام زاهر زهران
Prevalence & imperial glucose resolution (IGR) among schizophrenic client	3- صلاح علي دلال
Prescribing pattern of antipsychotic schizophrenic client in northern Palestine	4- جهاد محمد بني عودة

- شريطة
- موافقة المرضى أو ذويهم.
- الحفاظ على سرية معلومات المرضى
- موافقتنا بنسخة من نتائج البحث.

مع الاحترام...

الدكتور سعيد الهموز

مدير عام التعليم الصحي

وارد
03-05-2011

نسخة/ الأخ نائب الرئيس للشؤون الأكاديمية المحترم– جامعة النجاح الوطنية.

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An-Najah
National University
Faculty of Medicine

بسم الله الرحمن الرحيم

جامعة
النجاح الوطنية
كلية الطب

IRB Approval letter

Study title:
Blood profile of selected schizophrenic clients in northern Palestine

Submitted by:
Hisham Zaher Zhran

Date Reviewed:
Feb 23, 2012

Date approved:
April 3, 2012

Your study titled". Blood profile of selected schizophrenic clients in northern Palestine."
Was reviewed by An-Najah National University IRB committee & approved on
April 3, 2012

Samar Musmar,MD, FAAFP

IRB Committee Chairman,
An-Najah National University

IRB

نابلس - ص.ب ٧٠٧,٧ هاتف: ١٤/٨/٧/٤/٢٩٠٢٣٤٢(٠٩)(٩٧٢)، فاكسميل٢٣٤٩٧٣٩(٠٩)(٩٧٢)
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جامعة النجاح الوطنية

كلية الدراسات العليا

صورة الدم لدى مرضى الفصام العقلي في شمال الضفة الغربية

إعداد

هشام زاهر عبد الفتاح زهران

إشراف

د.إياد العلي

د. ادهم أبو طه

قدمت هذه الأطروحة استكمالاً لمتطلبات درجة الماجستير لتخصص تمريض الصحة النفسية المجتمعية بكلية التمريض في جامعة النجاح الوطنية في نابلس، فلسطين .

2013

صورة الدم لدى مرضى الفصام العقلي في شمال الضفة الغربية

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هشام زاهر عبد الفتاح زهران

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الملخص

الخلفية والأهداف: الأشخاص الذين يعانون من مرض الفصام العقلي يموتون مبكرا وذلك بسبب الأدوية المضادة للذهان ونمط الحياة لهؤلاء المرضى، وبالتالي المساهمة في زيادة معدلات الاعتلال والوفيات لهؤلاء المرضى. فالآثار الجانبية للأدوية المضادة للذهان على الدم تحدث بشكل غير متكرر ولكن لا تزال سببا محتملا للسمية الخطيرة ،والأشخاص الذين يعانون من مرض الفصام العقلي تكون الاختيارات الغذائية لهم سيئة. فتعداد الدم الكامل هو واحد من التدابير للتحقيق في هذه الاعتلالات والوفيات.

وكان الهدف من هذه الدراسة للتحقيق في صورة الدم والخصائص العامة في مجموعة من مرضى الفصام العقلي في شمال الضفة الغربية، فلسطين.

طريقة إجراء البحث :أجريت دراسة مستعرضة مقطعيه بين أغسطس 2011 وفبراير 2012 في مراكز الرعاية الصحية النفسية الحكومية في شمال الضفة الغربية. حيث تم اختيار 250 مريضا، وتم إجراء تعداد الدم الكامل (CBC) على عينات الدم التي تم جمعها من المرضى والذين انطبقت عليهم المعايير، وذلك للبحث في كريات الدم البيضاء والحمراء فضلا عن عدد الصفائح الدموية.

النتائج: لقد وجد أن عدد مرضى الفصام العقلي الذين يعانون من فقر الدم هو 63 (25,2٪). حيث أظهر التحليل الانحداري أن الجنس كان عاملا مهما ومرتبطا مع انتشار فقر الدم لدى مرضى الفصام العقلي، حيث كانت نسبة فقر الدم عند النساء مرتفعة بالمقارنة مع الرجال. كما كانت غالبية المرضى لديهم كريات الدم البيضاء و الصفائح الدموية في معدلها الطبيعي.

الاستنتاج والتوصية: نسبة فقر الدم (25,2٪) في عينة الدراسة، وذلك يمكن أن يكون راجعا إلى سوء التغذية، نمط الحياة غير الصحي لهؤلاء المرضى، والأدوية المضادة للذهان. فمن التوصيات لمقدمي الخدمات الصحية النفسية إيصال المرضى الذين يعانون من الفصام لمراكز التدخل المجتمعية الملائمة للكشف والوقاية والعلاج من فقر الدم. علاوة على ذلك، فإن انخفاض المستوى التعليمي بين المشاركين يجعل التعليم من المناطق ذات الأهمية التي تستدعي التدخل لاستهداف هذه المجموعة. وأخيرا، ينبغي تحسين مهارات العمل لهؤلاء المرضى.