

Evaluation of Nutritional Status among Adult Hemophilia patients enrolled in European Gaza hospital in Gaza strip, Palestine

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Abstract

Overview: Hemophilia is a genetic bleeding disorder caused by a deficiency of clotting factor and classified to Hemophilia A and B. Nutritional status is very important and proper nutrition among hemophilia patients is highly significant. This study aimed to evaluate nutritional status among adult hemophilia patients enrolled in the European Gaza Hospital in the Gaza strip.

Subject and method: The present study is descriptive design. A census sample used and the subjects were 27 hemophilia patients enrolled in European Gaza Hospital and they enrolled in Hemophilia and Thalassemia clinic. Data collected by self-administrative questioners and statistical analysis done by using SPSS version 23.

Results: The study pointed out that the average age of patients was about 30.3 years and most patients have foods induce bleeding and only 3.7% of them take vitamin supplementation. Prevalence of hepatitis was 37% of patients and the results not registered any patients obese while 37.0% of them were overweight. Only 5% of patients have a deficiency of total protein and albumin while 8% of them were anemic. Diversity score was the daily food that the highest score was starch followed by beverages while the lowest scores were nuts and sweeteners.

Conclusion: The study showed that the percentage of overweight, anemia, hepatitis, take foods to induce bleeding was elevated while the prevalence of hypoproteinemia and hypoalbuminemia was rare. Diet diversity score among hemophilia patients showed that the highest score of daily food was starch followed by beverages and the lowest score were nuts and sweeteners.

Recommendation: Hemophilia patients should avoid foods that increase their bleeding, and increasing the daily intake of food that improve blood clotting and maintain the normal weight. Also, we hope that the Ministry of Health in the Gaza strip, to use our findings as a first study ever in Gaza strip to increase workshops to advice the hemophilia patients to intake supplementation and increase awareness of patients to safe food guidelines.

Keywords

Nutritional status; Hemophilia; European; Gaza hospital

Introduction

Hemophilia is a hereditary, sex-linked blood defect occurring almost all in males that are marked by delayed clotting of the blood with prolonged or excessive internal or external bleeding after injury or surgery [1]. Nutrition status among hemophilia patients is important to patients in keeping patients healthy, and to keep extra weight off to avoid muscle strains and bleeding in vulnerable joints. The main nutrients important to increase red blood cell production are nutrients contains elements such as iron, protein, copper and vitamins(C, B12, B6& E) as well as folic acid [2,3].

According to recent studies, there are some foods that play a major role in increasing blood flow and bleeding, and other nutritious foods are playing a role in increasing blood clotting and stopping the bleeding. Surprisingly, several studies were focused on the most important foods that have a vital role in influencing the condition of Hemophilia patients, which leads to increased bleeding, joints, knees, elbows, and ankles. Also, increase skin or muscle bleeding [4,5]. Finally, these foods may lead to increase hematuria and occult blood in stool among hemophilia patients and therefore it is necessary to avoid these in the hemophilia cases [6]. Eating a healthy diet among hemophilia patients can strengthen bones and joints, help the patients maintain an ideal weight, and decrease the risk for chronic illnesses like diabetes and increase blood pressure [7,8]. To do that, hemophilia patients must be choose a diet that's high in fruits and vegetables, whole grains, legumes, lean proteins, and low-fat dairy products and they should be avoid processed foods, foods that are high in sugar, salt and foods that are high levels of fat or oil [9,10]. In addition, hemophilia patients should also aim to eat foods that included iron because the body's store of iron is depleted during bleeds [11]. Dark leafy greens, lean red meats, liver, poultry, dried beans, and raisins are very good sources of iron and a lot of vitamins [12,13]. Iron absorption in the intestine from foods is higher if taken with foods or drinks rich with vitamin C such as lemons, orange juice, bell peppers, and broccoli [14]. In brief, Nutrition plays a major role in influencing; improving or reversing the health status of many patients, including the health status of Hemophilia

patients [15]. This study investigates nutritional status among hemophilia patients in Gaza strips. To the best of our knowledge, this is the first study done in the Gaza Strip.

Material and Methods

Study design: This study was a descriptive study. This type of study design because of a limited number of hemophilia patients in European Gaza hospital measure prevalence for all factors under investigation.

Study population: All adult hemophilia patients, who registered in European Gaza hospital, and attending Hemophilia clinic, based on inclusion and exclusion criteria.

Setting: European Gaza Hospital which covers three Governorates of Gaza Strip regarding followed hemophilia patients (Eastern zone, Khan Younis and Rafah).

Sample and sampling: A census sample in the study was used because everyone of the population included in the study after applied the following inclusion and exclusion criteria.

Inclusion criteria: Only male gender, 12 years old and over, and agree to participate in the study, Levels of Factor 8 and 9 were documented.

Exclusion criteria: Diagnosed with current chronic or major illness like (renal disease, significant cardiovascular disease, D.M. H.T.N..., etc.), not enrolled in nutritional interventions, diagnosed with other bleeding disorders, and refuse to consent, Age less than 12 years.

Sampling and Sample size: The subjects were 27 hemophilia patients recruited in the study and they enrolled in Hemophilia and Thalassemia clinic and all patients were respondents according to the eligibility criteria and agreed to participate in the study.

Data collection: Socio-demographic and Socio-economic questionnaire, lifestyle and nutritional characteristics, anthropometric measurements, food frequency questionnaire were collected by designed tools. The dietary information of all food items will be obtained through a validated food frequency questionnaire, which was previously used in the Gaza Strip and it is a suitable and accurate tool to determine dietary diversity [15]. The anthropometric measurements which include body weight and height to calculate BMI was collected. Also, the hematological and biochemical measured such as hemoglobin and albumin and protein were collected from Hemophilia and Thalassemia clinic.

Statistical analysis: Statistical analysis and data entry was done by using the SPSS (statistical package for social sciences) software package version. Quantitative variables such as age,

BMI, hemoglobin, albumin and protein and food frequency questionnaire were described as mean \pm SD while categorical data such as marital status, education level, place of residence, work status, medical and nutritional characteristics were tabulated as frequency and percentage.

Ethical consideration: Patients confidentiality was respected by ensuring the anonymity of patients' records. All study data were recorded and investigators were responsible for accuracy, completeness, legibility of data. The manner of disseminating and communicating the study results guaranteed the protection of the confidentiality of the patient's data. Informed consent was obtained due to administrative approval from the Palestinian ministry of health and from the European Gaza hospital was requested.

Results

Socio-demographic and economic characteristics of hemophilia patients illustrated in (Table 1). The table showed the average age, marital status, education level, place of residence and work. The results pointed out that the average age (SD) of patients was about 30.3 (13.5) years. Regarding marital status, the results showed that more than half of hemophilia patients were single (51.9%), while the rest married (48.1%). The education levels showed that 18.5%, 29.6%, 48.2% & 3.7% were illiterate, Secondary school; university level, and high education, respectively. Most patients are live in Khan Younis governorate 81.5% while 18.5% live in the Rafah governorate. A large proportion of hemophilia patients do not have work (63.0%) and only 37.0% of them are an employee. The arithmetic mean of income (SD) among patients is 546.3 (354.6) NIS.

Table 1: Socio-demographic and economic characteristics among the Hemophilia patients.

| Socio-demographic and economic characteristics | Total | |
|--|----------|---------------|
| | n (%) | Mean (SD) |
| Age (Years) | | 30.3 (13.527) |
| Marital Status | | |
| Married | 13(48.1) | |
| Single | 14(51.9) | |
| Education Level | | |
| Never to be school | 5(18.5) | |
| Secondary school | 8(29.6) | |
| University level | 13(48.2) | |
| Higher education | 1(3.7) | |

| | | |
|---------------------------|-----------|--------------|
| Place of residency | | |
| Khan Younis | 22 (81.5) | |
| Rafah | 5(18.5) | |
| Work | | |
| Yes | 10(37.0) | |
| No | 17(63.0) | |
| Income (NIS) | | 546.3(354.6) |

Medical and nutritional characteristics among Hemophilia patients

Table 2 describes the medical and nutritional properties of Hemophilia patients, the results showed that the average (SD) meals intake was 2.8(0.5) servings per day while the average (SD) snack intake was 1.1 (0.9) servings per day and the average (SD) fluid consumed were 2.5 (1.0) cups of fluid per day. Sixty-three percent of the patients escape from taking meals. The results showed that of patients' type of Breakfast 35.3%, 58.5% and 5.9% of patients escaped from breakfast, dinner, and lunch, respectively. The patients showed that 44.5% often took dinner 44.5% while 14.8%, 40.7% were sometime and rarely, respectively. Most patients have foods induces bleeding and only 3.7% of them take vitamin supplementation. Classification of hemophilia showed that the prevalence of hemophilia A was higher than hemophilia B(88.9% vs. 11.1, respectively). Regarding hepatitis, the results showed 10 (37%) patients are hepatitis carries (2hepatitis B and 8hepatitis C). On the other hand, 11.1 % of them have other diseases and 14.8% undergo physiotherapy treatment and 11.1% have a joint transplant (Table 2).

Table 2: Medical and nutritional characteristics among Hemophilia patients.

| Medical and nutritional characteristics | Total | |
|---|-----------|-----------|
| | n (%) | Mean (SD) |
| Number of the meal (serving/daily) | | 2.8 (0.5) |
| Number of snacks (serving/daily) | | 1.1(.9) |
| Fluid consumed (cup/daily) | | 2.5 (1.0) |
| Escape of meal | | |
| Yes | 17 (63.0) | |
| No | 10 (37.0) | |
| If escape | | |
| Not escape | 9 (33.3) | |

| | | |
|-------------------------------------|-----------|--|
| Breakfast | 10 (37.0) | |
| Lunch | 1 (3.7) | |
| Dinner | 7 (25.9) | |
| Fast meal | | |
| Often | 12 (44.4) | |
| Some time | 4 (14.8) | |
| Rarely | 11 (40.7) | |
| Foods induce bleeding | | |
| Yes | 17 (63.0) | |
| No | 10 (37.0) | |
| Vitamin supplementation | | |
| Yes | 1 (3.7) | |
| No | 26 (96.3) | |
| Classification of hemophilia | | |
| Hemophilia A | 24 (88.9) | |
| Hemophilia B | 3 (11.1) | |
| Hepatitis | | |
| Yes | 10 (37.0) | |
| No | 17 (63.0) | |
| If have hepatitis, type | | |
| Hepatitis B | 2 (20.0) | |
| Hepatitis C | 8 (80.0) | |
| Other diseases | | |
| Yes | 3 (11.1) | |
| No | 24 (88.9) | |
| Physiotherapy | | |
| Yes | 4 (14.8) | |
| No | 23 (85.2) | |
| Joint Transplant | | |

| | | |
|-----|-----------|--|
| Yes | 3 (11.1) | |
| No | 24 (88.9) | |

Lifestyle characteristics among Hemophilia patients

Table 3 illustrated the daily life system among Hemophilia patients. The results showed that the majority of hemophilia patients have used the internet (74.1%) and the average (SD) time for using the internet was 2.6 (2.0) hours per day. Regarding watching T.V, the results showed that 85.2% of them watched T.V. and the average (SD) time for watching T.V was 1.4 (0.9) hours per day. The table showed that less than half of patients were playing sport(44.4%) and 7.4% and 74.1% of them were walking frequency once and more than once a week, respectively while only 7.4% of patients not walk. On the other hand, the results reported that only 18.5% of hemophilia patients were smoking (Table 3).

Table 3: Lifestyle characteristics among Hemophilia patients.

| Lifestyle characteristics | Hemophilia patients (n=27) | |
|-------------------------------|-------------------------------|-----------|
| | n (%) | Mean(SD) |
| Internet use | | |
| Yes | 20 (74.1%) | |
| No | 7(25.9%) | |
| Watch internet (hours) | | 2.6 (2.0) |
| T.V use | | |
| Yes | 23(85.2%) | |
| No | 4(14.8%) | |
| Watch T.V. (hours) | | 1.4 (0.9) |
| Sporting | | |
| Yes | 12(44.4%) | |
| No | 15(55.6%) | |
| Walking frequency | | |
| Once a week | 2(7.4%) | |
| More than once a week | 20(74.1%) | |
| Not walk | 5(18.5%) | |

| | | |
|----------------|-----------|--|
| Smoking | | |
| Yes | 5(18.5%) | |
| No | 22(81.5%) | |

Anthropometric characteristics among Hemophilia patients

Anthropometric characteristics among hemophilia patients pointed out in table 4. The results showed that the average (SD) weight, Height, BMI among patients were 61.4 (13.5) Kg, 1.6 (0.2 m) and 23.4 (3.8) 61 kg/m², respectively. Regarding the obesity, the results not registered any patients obese while 37% of them were overweight and 63% were normal weight (Table 4).

Table 4: Anthropometric characteristics among Hemophilia patients.

| Anthropometric characteristics | Hemophilia patients | |
|--------------------------------|---------------------|-------------|
| | n (%) (n=27) | Mean(SD) |
| Weight (kg) | | 61.4 (13.5) |
| Height (m) | | 1.6 (0.2) |
| BMI (kg/m ²) | | 23.4(3.8) |
| BMI groups | | |
| Normal weight | 17(63.0%) | |
| Overweight | 10(37.0%) | |
| Obese | 0 (0.0%) | |

Total protein, albumin and hemoglobin levels among hemophilia patients among Hemophilia patients

Total protein, albumin first study and hemoglobin levels among hemophilia patients illustrated in (Table 5). The results reported that the average levels of total protein, albumin and hemoglobin were 7.4 g/dl, 3.9 g/dl, and 13.0 g/dl, respectively. On the other hand, the results showed that only 5% of patients have a deficiency of total protein and albumin while 8% of them were anemic (low hemoglobin) (Table 5).

Table 5: Total Protein, albumin and hemoglobin levels among Hemophilia patients.

| Variables | Total (n=27) | |
|----------------------|--------------|--------------|
| | n(%) | Mean(SD) |
| Total Protein | | |
| Normal | 22 (81.5%) | 7.4(0.732) |
| Low | 5 (18.5%) | |
| Albumin | | |
| Normal | 22 (81.5%) | 3.9 (0.564) |
| Low | 5 (18.5%) | |
| Hemoglobin | | |
| Normal | 19 (70.4%) | 13.0 (1.719) |
| Low | 8 (29.6%) | |

Diet diversity score among Hemophilia patients

Table 6 summarized Diet diversity score among Hemophilia patients, the table showed that diet profile according to diversity score where the daily food that highest score (SD) was starch 9.8 (0.8) followed by beverages (9.6 (1.0)), vegetable (7.8 (1.5)), legumes (6.8 (1.5)), fruit (6.7 (2.2)), snacks (6.3 (3.7)), poultry (5.0 (0.3)), meat (4.9 (1.2)), eggs (4.7 (1.9)), grains (4.5 (2.4)), dairy products (4.2 (3.0)), soups (4.1 (2.1)), fish (3.8 (2.1)), nuts (3.7 (2.3)) and sweeteners (3.4 (2.9)), respectively (Table 6).

Table 6: Diet diversity score among Hemophilia patients.

| Variable | Mean(SD) |
|------------------|-----------|
| Starches | 9.8 (0.8) |
| Beverages | 9.6 (1.0) |
| Vegetable | 7.8 (1.5) |
| Legumes | 6.8 (1.5) |
| Fruit | 6.7 (2.2) |
| Snacks | 6.3 (3.7) |
| Poultry | 5.0 (0.3) |
| Meat | 4.9 (1.2) |

| | |
|-----------------------|-----------|
| Eggs | 4.7 (1.9) |
| Grains | 4.5 (2.4) |
| Dairy Products | 4.2 (3.0) |
| Soups | 4.1 (2.1) |
| Fish | 3.8 (2.1) |
| Nuts | 3.7 (2.3) |
| Sweeteners | 3.4 (2.9) |

Discussion

Hemophilia occurs when one of the clotting factors needed for the blood to form clots is absent or reduced [16]. Although, Hemophilia patients need medical treatment, but also prevention measures, including nutritional status is very important and proper nutrition among hemophilia patients is highly significant, especially important to combat an increase in the number of weight people with bleeding [17]. According to several studies that showed association between preventing bleeding among Hemophilia and type of diet. In addition, a lot of factors affected on bleeding controls among patients such as prevent take some type of food [17-19]. In this study, a descriptive study was designed to focus on nutrition assessment among adult hemophilia patients enrolled in the European Gaza hospital in Gaza strip. The study showed that the average of patients age about thirty and about half of patients were married and have university and high education. Also, the results showed that only one-third of patients have a chance at work. These results agree with Curtis et.al., they showed that about half of adults with hemophilia in the united states were married, have university certificated and thirty aged [12] and also other study pointed out low percentage of employee among hemophilia patients [20] and this explain decrease income levels among patients and single status [11].Lifestyle characteristics among hemophilia patients were studied and showed that most of the patients were used the internet watching T.V and playing sport. Some studies found that hemophilia patients' life as normal people and have the quality of life as same as a normal healthy individual [19,21]. Roushan et al., and Cancienne et al., showed the limited number of smokers among hemophiliac patients and results agree with our study [22,23].Anthropometric characteristics among hemophilia patients showed that more than one-third of patients were overweight while never found obese between them, Analysis of the previous study shows that elevated body weight due to change in biomechanical parameters such as lipid profile [24]. On the other hand, Biere-Rafi et al. were studied cardiovascular risk assessment in hemophilia patients. Thrombosis and homeostasis, and they showed lipid profile and BMI supports the findings of atherosclerosis development hemophilia patients [25].

Regarding, the medical and nutritional properties of hemophilia patients, the results showed that the average meals intake among patients were three times daily while one-time snack intake with fluid consuming 2.5 cups of fluid per day. Scully et al., 2008 showed that older and adult hemophilia patients, snack foods and drinks especially should be free of sugars. Because of the risk of erosion as well as caries, frequent consumption of carbonated and cola type drinks should be discouraged. Fruit juices such as grapefruit, apple, or orange can also cause tooth erosion. For children, water and milk are the best options [26]. The study showed more than half of patients were escaped from taking meals. Surprising, most of the patients have foods induces bleeding and only few numbers of them were taking vitamin supplementation and these results agree with Batt et al., [27]. The study pointed out that the majority of patients were hemophilia A. A study done by Raja& Rani reported the studied prevalence of hemophilia A and B, they showed that 86.2% were Hemophilia A and 33.8% of patients were Hemophilia [28].

Unexpectedly, the results of more than one-third of patients were hepatitis carries and the majority is the hepatitis C virus. The results of this study agree with the study reported Hosseini et al., they were assessment of the prevalence of hepatitis C and B viruses in patients with hemophilia in Iran and they showed that among the blood-borne viral hepatitis B& C in the hemophilia population, the incidence of hepatitis C is elevated. The explanation for that is because in recent years, viral screening and monitoring the donated blood reduced the risk of the incidence of viral hepatitis in the blood components (Fresh Frozen plasma & Cryoprecipitate) recipient hemophilic populations. Additionally, Laboratory diagnosis of HCV infection among blood donors is based on the detection of anti-HCV antibodies by enzyme immunoassay (EIA) techniques in Gaza Strips and never confirm by Polymerase chain reaction (PCR) tests. However, EIA techniques still lacking detection of low titer (Serum/Cut-off; S/C= 1.0) anti-HCV antibodies and that may be increased incidence on HCV among hemophilic populations. The risk of transmission of hepatitis viruses has been markedly reduced but not completely eliminated [27-29]. On the other hand, a few numbers of them suffer from other diseases or undergo physiotherapy treatment and joint transplants due to hemophilic arthropathy (changes in synovium and cartilage). In brief, A considerable number of studies concerning blood-induced joint damage suggest that synovial changes have a leading role in the development of joint damage. However, there are also reported that intra-articular blood has a direct effect on cartilage before synovial changes and suggest that joint damage may occur before synovial inflammation is evident [30]. In the current study, the percentage of hypoproteinemia and hypoalbuminemia was rare among hemophilia patients and these results agree with Norton et al., they were studied abnormal coagulation factor VIII transcript in a Tennessee walking horse colt with hemophilia and they concluded causes of the hypoproteinemia and hypoalbuminemia in same Hemophilia cases maybe by blood loss and decreased hepatic protein synthesis was another possible contributor to the decreased albumin and protein level in blood circulation which lead to abnormal coagulation function [31].

The prevalence of anemia among hemophilia patients in this study was markedly elevated. Several studies showed that with giving reasons included subcutaneous hematoma, Chronic Iron deficiency anemia, peptic ulcer disease bleeding, hematuria, and history of trauma. The patients had family history of hemophilia [32,33]. Clearly, the studies showed that hemophilia patients must be controlled on diet with followed certain systems and eat a balanced diet daily for healthy food to prevent bleeding complications[18].Diet diversity score among hemophilia patients showed that the highest score of daily food was starch followed by beverages and vegetables and the lowest scores were fish, nuts, and sweeteners. The results of the current study agree with other studied that showed starch, beverages and vegetable high intake among hemophilia patients while lowing in eating fish, nuts and sweeteners [34,35]. Scully, et al. recommended that chewing sugar-free gum or cheese among hemophilia patients after meals may help to increase the saliva in the mouth and may protect against plaque acids [26].

Conclusion

The present study aimed to examine the nutrition assessment among adult hemophilia patients enrolled in the European Gaza Hospital in the Gaza strip. A descriptive study designed to focus on the research objective. The study showed that about half of patients were married and have university and high education. Also, most of the patients were used the internet watching T.V and playing sport. On the other hand, more than one-third of the patients were overweight while never found obese between them. The study showed that more than one-third of patients were hepatitis carries and the majority is hepatitis C virus. However, the study pointed out the percentage of hypoproteinemia and hypoalbuminemia was rare among hemophilia patients and the prevalence of anemia among hemophilia patients in this study was markedly elevated. Diet diversity score among hemophilia patients showed that the highest score of daily food was starch followed by beverages and vegetable and the lowest scores were fish, nuts, and sweeteners. Hemophilia should avoid foods that increase their bleeding and increasing the daily intake of food that improves blood clotting and maintain normal weight. Also, we hope that the Ministry of Health in Gaza strip, to use our findings as a first study ever in Gaza strip to increase workshop to advice the hemophilia patients to intake supplementation and increase awareness of patients to safe food guideline.

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Conflict of Interest

The authors declare no conflict of interest.

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