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Research Article

Study of Clinical Characteristics and Management Strategy of Diabetic Foot among Type II Diabetic Patients During Benghazi War

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Abstract

Diabetic foot is the most devastating complication of diabetes mellitus, which affect 15% of the diabetic patients during their lifetime and leading to limb amputation and marked morbidity and mortality.

Aims: This study is a trial to describe the clinical characteristics and management strategy of diabetic foot among diabetic cases in Aljala hospital during the critical time of Benghazi war in 2012 and ongoing years up to 2016.

Subjects and Methods: A retrospective case series study was conducted in which the data of the patients were extracted from the archived files of diabetic patients having foot problem related to diabetic peripheral neuropathy were the target population.

The results: This study included 98 diabetic foot cases, their mean age was 50.2(±11.6) years. The male patients represented around 53% of the sample. 58.2% of the sample has been diabetic for duration exceeds 10 years,. 30.6% has hypertension as co-morbidity. Renal disease was found in 11.2 of the cases. 50% of the cases were admitted as case of collection, 21.4% foot ulcer, 17.2%, wet gangrene, ischemia and cellulitis in 6.1% and 5.1% respectively. X-ray study done to 74.5% of the sample, it was normal in 62.2%, showed signs of osteomyelitis in 12.2%. Doppler ultrasonography was not done to 71.44% of the cases. 12.4% of the cases with Doppler have mild vascular stenosis. 10.2% significant stenosis in 6.1% atherosclerosis. Duration of diabetes of more than 10 years is significantly associated with more aggressive surgical intervention (Ficher`Exact test = 15.1, P= 0.046). Longer duration of diabetes is additionally significant companion for renal disease (Ficher`Exact test = 7.1, P= 0.021).

Conclusion: Duration of diabetes for more than 10 years is insignificantly associated with greater possibility of being admitted as case of collection, foot ulcer and shows significant greater chance of more aggressive surgical intervention like minor, major or multilevel amputation compared to presence of diabetes for less than 10 years. The duration of diabetes is additionally significant companion for renal disease.

Keywords: Diabetes Mellitus; Diabetic Foot Ulcer; Debridement; Amputation; Foot Care

Introduction

Diabetic foot is a spectrum of problems occurs to diabetic patients due to vascular insufficiency that can impair the quality of life and requires prolonged hospitalization and responsible for diabetes related morbidity, mortality, and financial burdens [1]. Moreover, it might lead to lifelong disability due to loss of the limb. It is reported that up to 28% diabetic foot patients end up with amputation. Infected foot wound precedes about two thirds of the

lower extremity amputations, which occurs as a complication of arterial insufficiency that will result in prolonged healing and indicating an elevated risk of amputation [2].

Prolonged healing or decreased healing potential of a diabetic patients stems from the metabolic disorders associated with diabetes, which result from poor glycaemic control, reduced circulation and arterial blood flow, unwell nutritional status, toxins and fluid accumulation in the affected region of the foot and presence of infection is a superadded problem [3].

At cellular level, the metabolic disorder results due to hyperglycaemic state and leads to an increase in action of two enzymes namely aldose reductive and sorbitol dehydrogenase. This increase will result in the conversion of intracellular glucose to sorbitol and fructose. The accumulation of these sugar products results in a decrease in the synthesis of nerve cell myoinositol which is required for normal neuron conductivity. Furthermore, the chemical conversion of glucose results in depletion of nicotinamide adenine dinucleotide phosphate stores, which are necessary for the detoxification of reactive oxygen species as well as for the synthesis of the vasodilator nitric oxide. There is a resultant increase in oxidative stress on the nerve cell and an increase in vasoconstriction leading to ischemia. The ischemia subsequently will promote nerve cell injury and death. Hyperglycemia and oxidative stress also contribute to the abnormal glycation of nerve cell proteins and the inappropriate activation of protein kinase C, resulting in further nerve dysfunction and ischemia [4].

Lower extremity amputation is the most costly and feared consequence of a foot ulcer. The risk factors for amputation are multiple and generally can be referred to systemic considerations and localized considerations. Due to the foot pathology; the systematic risk factors for major amputation are neuropathy, peripheral arterial disease, poor glycemic control, older age, male sex, ascending lymphangitis and duration of diabetes. Whereas the localized considerations are infection with Gram-positive microorganisms in cultures, history of prior foot ulcer or amputation, structural foot deformity, trauma, Charcot foot, calcaneal lesions, Wagner grade 5 lesions (Dos Santos., *et al*. 2006). Serum inflammatory markers such as leukocytosis, C-reactive protein, and erythrocyte sedimentation rate may predict severity of foot infection in diabetic patients [5].

Epidemiological background

Diabetes is described as a global epidemic of the 21st century [6]. The prevalence of diabetes in year 2000 worldwide was estimated to be 131 million [7]. In Libya the prevalence of diabetes in people over 20 years of age was 14.1% in the same year 2000 [8]. In 2010, four out of the top five countries with diabetes were from the Arab world namely United Arab Emirates (18.7%), Saudi Arabia (16.8%), Bahrain (15.4%) and Kuwait (14.6%) [9]. Diabetes is a growing health problem. It is projected that in year 2030 the number of affected people will increase from 131 million to 366 million. The increase is dramatic in type 2 diabetes, especially among young and obese persons [7]. This increase is referred broadly to 2 reasons which are; the ageing population around the world as well as unhealthy lifestyles which is increasing obesity and overweight problems [10].

Diabetic foot is a very common problem of diabetic patients. It is estimated to occur in 19-34% of all diabetic according to new England journal of diabetes [11], In addition, it is reported that every 30 seconds 1 leg is amputated due to diabetic foot ulcer worldwide [12].

In Libya there is no sufficient and recent data to help recognize the magnitude of the problem. Therefore this study was conducted to enlighten some of uncertainty about diabetic foot, and to know the impact of the unstable situation of our country on this substantial health problem.

Review of Literature

Diabetes is one of the leading causes of death in many countries. It is responsible for major health problem such as blindness, renal failure, dialysis, and non-traumatic amputation. Diabetic patients are particularly susceptible to foot diseases such as ulceration and infection, due to peripheral sensory neuropathy that lead to unperceived trauma, which is the primary factor leading to diabetic foot ulcerations [2], about 45% to 60% of all diabetic ulcerations are of pure neuropathic aetiology. Whereas around 45% due to combined neuropathic and ischemic aetiology. Foot ulcers are associated with increased mortality [13].

Peripheral neuropathy and ischemic limb are closely related and very common consequences. They are considered as a leading cause of morbidity and hospitalization for persons with diabetes.

These consequences might end up with limb threatening disorders such as ulceration, infection, gangrene, and amputation [14].

Foot ulcer in diabetic patients is the most important alarming event of diabetic foot. The annual incidence of diabetic foot ulcers is around 3%. The reported incidence in U.S. and U.K. studies ranges as high as 10% and the overall one quarter of diabetic patients have lifetime risk of developing foot ulcer [15].

Damage to autonomic innervations leads to a reduction in sweat, oil gland secretion and function which make foot skin loses its natural ability to moisturize the overlying skin and becomes dry. Thus will be more susceptible to tears and subsequently will be more likely to develop infection. The loss of sensation as a part of peripheral neuropathy exacerbates the development of ulcerations. When trauma occurs at the affected site, patients are often unable to detect the insult to their lower extremities. As a result, many wounds will be unnoticed and will get progressively worse [15].

A study done on Libyan diabetic patients found that glycaemic control has strong effect on long term diabetic complication. They reported that patients with poor glycaemic control had higher risk for complications than the well-controlled patients. The peripheral neuropathy occurred in 40.1% of the patients with good control and 48.8% of patients with poor control. The peripheral arterial disease occurs in 14.6 in patients with good control and in 15.4% in poor glycaemic control diabetics [16].

In the New England Journal of Medicine, they mentioned that the lifetime incidence of foot ulceration in people with diabetes ranges between 19% and 34%. For people with a healed foot ulcer, the one-year ulcer recurrence is a staggering 40%. This increases to 60% after three years [11]. Occurrence of ulcer is a very challenging event in presence of vascular insufficiency because the intact foot may withstand markedly reduced skin perfusion. Whereas an ulcerated lesion requires a greatly enhanced blood flow to heal. Therefore, many ulcers fail to heal when critical ischemia exists perhaps in diabetic cases [17].

A multicentre study attributed the aetiology of diabetic foot ulcers to the critical triad of peripheral sensory neuropathy, trauma, and deformity [13].

Foot ulceration is a preventable condition where simple interventions can reduce amputations by up to 70% through programs that could reduce its risk factors and result in improving patients' quality of life and reducing the economic burden on both the patient and the health care system [18]. Therefore it is of utmost importance to pay attention for recognizing risk factors for diabetic foot ulceration in order prevent its occurrence. If the same occurred proper evaluation and good management should be prompt to save the limb [19].

Proper and adequate evaluation of ulcer by which, full description of ulcer characteristics such as size, depth, appearance, location, signs of infection and presence of gangrenous tissue. These characteristics are used as guide for the initial management. Re-evaluation is done to provide the mapping of progress during treatment. Moreover, the evaluation should ascertain whether the lesion is neuropathic, ischemic, or combination of both neuro-ischemic aetiology, pressure sensation usually examined. If the patient fails to perceive the pressure of a 10-g monofilament that is a proven indicator of peripheral sensory neuropathy and loss of protective sensation [20].

Vascular assessment is done by clinical examination or using Doppler ultrasonography. The previous research found that more than 60% of diabetic foot ulcers have decreased arterial blood flow due to concurrent peripheral vascular disease. The diabetic cases require continuous vascular studies after examination of vascular status of the posterior tibial and dorsalis pedis arteries with palpation and handheld Doppler ultrasound. If the palpation is inconclusive. The ankle-brachial index (ABI) is an easy measure to obtain and will be helpful in assessing vascular status [21].

The results of the foot evaluation should aid in developing an appropriate management strategy. When an ulcer is present it should be described and classified to decide management requests. There are many classification systems used to depict ulcers that can aid in developing a standardized method of description. These classification systems are based on a variety of physical findings. Wagner Ulcer Classification System is one of the most popular systems of classification [15], which is based on wound depth and the extent of tissue necrosis (Table 1). However, Wagner Ulcer Classification was criticized because it only considers wound depth and appearance and does not take into account the presence of ischemia or infection [22].

Grade	Lesion
1	Superficial diabetic ulcer
2	Ulcer extension involving ligament, tendon, joint capsule, or fascia with no abscess or osteomyelitis
3	Deep ulcer with abscess or osteomyelitis
4	Gangrene to portion of forefoot
5	Extensive gangrene of foot

Table 1: Wagner Ulcer Classification System.

In general, an ulcer or wounds of increasing grade and stage are less likely to heal without vascular repair or amputation [22].

According to diabetic foot ulcer evaluation the grade treatment modality will be decided. Management of diabetic foot ulcers includes group of options mainly offloading and debridement.

Firstly offloading which done to redistribute force from ulcers sites and pressure points at risk to a wider area of contact. There are multiple methods of pressure relief including total contact casting, half shoes, removable cast walkers, wheelchairs, and crutches. The choice depends on some factors including overall wound condition, presence of infection and the likelihood for patient compliance [23].

Secondly debridement, it is the removal of necrotic and senescent tissues as well as foreign and infected materials from a wound, which is considered as the most important therapeutic step leading to wound closure and a decrease in the possibility of limb amputation in patients with diabetic foot ulcer [24]. Debridement comprises the removal of unhealthy tissue and removing colonizing bacteria in the wound. Therefore it decreases bacterial counts and stimulates production of local growth factors. This also reduces pressure, and helps wound drainage. Additionally it facilitates the collection of appropriate specimens for culture and permit examination of deep tissues at ulcer bed [25].

Although there are different kinds of debridement including surgical, enzymatic, autolytic, mechanical and biological debridement. Among these methods, surgical debridement done to turn a chronic ulcer into an acute ulcer by cutting away dead and infected tissues followed by daily dressing with application of saline moistened cotton gauze. The surgical debridement should be repeated whenever it is needed as often as needed if new necrotic tissue continues to form [26].

It was proved that the more frequent the debridement, the better the healing outcome, a retrospective cohort previously done indicated that frequent debridement healed more wounds in a shorter time with very high significant results [27].

Most diabetic foot ulcers present as polymicrobial infections. The most common pathogens seen are aerobic Gram-positive cocci, in particular Staphylococcus aureus, and Gram-negative rods such as Pseudomonas aeruginosa. Infection with anaerobic organisms such as Clostridium perfringes may lead to foot ischemia or gangrene. Deep wound cultures and blood cultures are useful to help direct antibiotic therapy and monitor the presence of early sepsis [28].

Despite all the efforts to avoid limb loss, overall diabetes is the predominant etiology for non-traumatic lower extremity amputations in the U.S. It was estimated that more than 80,000 diabetes-related amputations each year [13]. Half of all non-traumatic amputations are a result of diabetic foot complications, and the 5-year risk of a other limb (contralateral) amputation is 50% [29].

Study objectives

This study aims at:

- Studying the cases of diabetic foot in relation to clinical and socio-demographic characteristics in Benghazi during the city crisis of war.
- Comparing the risk of limb loss across gender and age groups.

Subject and Method

Study design

A retrospective cross section study design was conducted, a case series for diabetic patients having foot problem related to diabetic peripheral neuropathy were the target population. Their data were accessed retrospectively by finding the archived files of the cases.

Sampling and settings

A convenient sample of the files was drawn. Data was extracted from the files of the discharged cases of diabetic foot cases managed at Aljala hospital of Benghazi. The data were collected during the period from January 2017 to February 2018. The files containing complete data were included for the admitted cases during the time of instability of the city of Benghazi i.e. during the war time form January 2012 to January 2016.

Inclusion criteria

- Adult age group (not less than 18 years).
- Diabetic patient both type1 and type2 with foot complications.
- Admission time between beginning of 2012 to the beginning of 2016.

Data collection tool

A sheet of data was filled up for each case. The data were baseline data such as age, sex, of the patients. Diabetes related data such as duration of diabetes and presence of co-morbidity. Diabetic foot related data which was the major part of the questionnaire containing data like diagnosis at admission, surgical intervention, blood and radiological investigations, information about previous admission due to diabetic foot (the appendix).

Data analysis and software

SPSS for Windows v21.0 (SPSS Inc., Chicago, IL,USA) was used for the statistical analyses. Descriptive analysis with relevant tables. Continuous variables were displayed as mean (± standard deviation). Categorical variables were displayed as counts and percentages. For inferential statistics the chi square or Ficher Exact`s tests were used. P <0.05 was considered statistically significant.

Ethical considerations

The files of the cases were accessed after getting permission from the authorized personals by a formal letter and consent of Aljala hospital. The data of the patients were collected and analysed anonymously to secure the patients privacy. The researcher group is completely responsible for any consequence might come out due to the study.

Results

Descriptive results

This study utilize data of 98 of diabetic patients with diabetic foot, the type of diabetes was not mentioned in all files. As there is no difference in management of diabetic foot according to the type, we decided to put all cases under one category, "diabetic foot". The age of the study sample was ranged between 26 to 85 years (Figure 1), with mean of 50.2(±11.6) years. The male patients represented 53% of the sample (52 cases) and females represented 47% (46 patients). 29.6% of the patients have diabetes for 10 years or less. 58.2% are diabetic for more than 10 years (missing 12.2%). More than half of the sample were diabetes mellitus only, renal disease is present in 11.2% of the sample (Table 2).

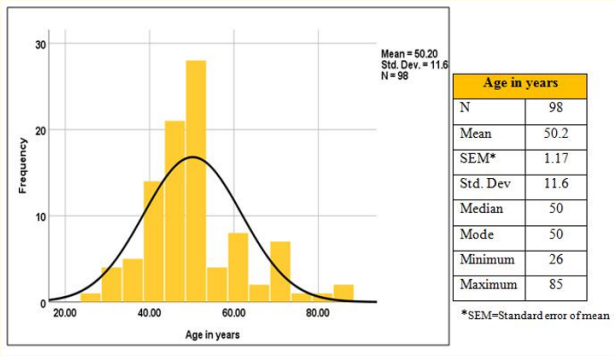

Figure 1: Study sample age distribution.

Characteristic and sub-categories.		Count	%
Sex	Male	52	53.1
	Female	46	46.9
Duration of diabetes	≤ 10 years	29	29.6
	> 10 years	57	58.2
	Unknown	12	12.2
Chronic illness	Diabetes only	55	56.1
	Diabetes and Hypertension	30	30.6
	Multiple illnesses	13	13.3
Renal disease	Yes	11	11.2
	No	87	88.8
Diagnosis at presentation	Foot ulcer	21	21.4
	Collection	49	50
	Ischemia	6	6.1
	Wet gangrene	17	17.3
	Cellulitis	5	5.1

Table 2: Demographic and clinical characteristics of the sample. No missing data in all the variable. The total number (N) =98 case.

They were all admitted to the surgical department either with collection (50%), foot ulcer(21.4%), wet gangrene (17.4%), ischemia or cellulitis (6.1%, 5.1% respectively), (Table 2). The x-ray study done to majority of the sample. It was normal in 62.2%, showed signs of osteomyelitis in 12.2% and not done for 25.5%, (Figure). Whereas Doppler ultrasonography was not done to 71.44% of the cases. For those with Doppler, the result was as following; 12.4% have mild vascular stenosis, 10.2% have significant stenosis and 6.1% atherosclerosis (Table 2).

All the cases were admitted to surgical department for management (Figure 2). Thus most of the cases were subjected to surgical intervention and only 4% were treated conservatively. About 48% have had debridement, 20.4% incision and drainage, amputation was done to more than 27% of the sample which varied between minor amputation (18.4%), major amputation (6.1%), and multilevel amputation (3%). Few of the study sample has previous admission for similar illness. 19.4% of them have history of minor amputation, 3.1% major amputation, while only 2.04% had multiple amputation.

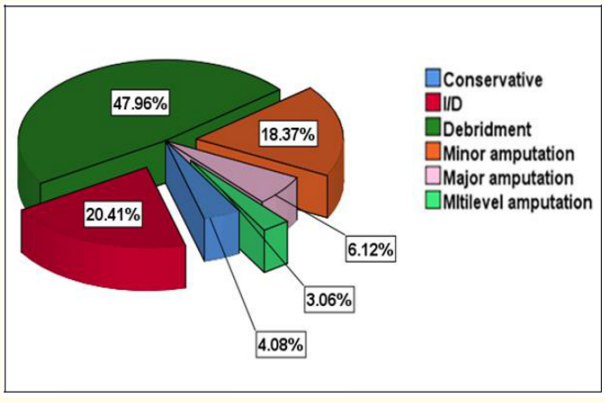

Figure 2: Mode of treatment for the current ischemic illness.

Inferential results

Inferential statistics were performed to assess correlation between some variables mainly to find determinants of management strategy. The age and gender as the main independent variables in this study were used to categorize the study sample and to know their relation to mode of treatment. The main outcome was variable (dependent variable). There was a notable difference in management choice between the patients aged ≤50 years and those whose age is > 50 years. More cases of relatively aggressive surgical intervention such as major amputation and multilevel amputation in the age group of > 50 years. No any conservative management was done to them compared to younger age group. This difference using Fischer-exact test was not statistically significant (value = 4.4, P= 0.49). Furthermore, Male patients were subjected to more aggressive surgical option compared to females. This difference did not reach statistical significance (Fischer-exact test value = 5.4, P= 0.36).

The older age group was associated with greater chance of having other chronic illness beside diabetes (Pearson Chi square value =7.5, P= 0.02, table 3).

Chronic illness	Age		Total	
	≤ 50	>50		
D.M only	44	11	55	Pearson chi square test value = 7.5 Degree of freedom=2 P value =0.024
D.M and hypertension	18	12	30	
Multiple illnesses	6	7	13	
Total	66	30	98	

Table 3: Age group and chronic morbidity.

Duration of diabetes for more than 10 years is insignificantly associated with increased possibility of being admitted as case of collection, foot ulcer and wet gangrene (Table 4). Whilst it shows significant chance of more aggressive surgical intervention like minor, major or multilevel amputation, compared to presence of diabetes for less than 10 years (Ficher`Exact test = 15.1, P= 0.046, table 5), Also, Longer duration of diabetes is an additionally significant companion for renal disease (Ficher`Exact test = 7.1, P= 0.021).

Diagnosis	Duration of diabetes		
	≤ 10 years	> 10 years	
Foot ulcer	4	15	Fisher`Exact test Value = 5.3 P= 0.08
Collection	15	26	
Ischemia	2	3	
Wet gangrene	5	11	
Cellulitis	3	2	
Total	29	57	

Table 4: Duration of diabetes and diagnosis at admission.

Management	Duration of diabetes		
	≤ 10 years	> 10 years	
Conservative	4	0	Fisher `Exact test Value = 15.1 P= 0.046
Incision and drainage	6	8	
Debridement	14	29	
Minor amputation	4	12	
Major amputation	0	6	
Multilevel amputation	1	2	
Total	29	57	

Table 5: Duration of diabetes and management option.

Discussion

Diabetic foot is a long term complication of diabetes, in which infection ulceration and necrosis of tissues of the lower limb occur. In this study we found that the male patients were marginally greater in number than female patients. In another study, researchers found similar results with male to female ratio of 3:2. This explained that the predominance in their study was referred to few factors, such as male are more exposed to trivial foot injury, foot wear trauma and walking with bare, particularly in mosques and working in agricultural fields [30].

The principles of treatment of diabetic foot ulcers have remained unchanged for many years. Debridement of the wound to get rid of any dead or non-healthy tissue which might slow down healing process, pressure relief either by combination with debridement and removal of callus, offloading the diabetic foot, removable below-knee walking boots, or a total contact plaster cast, and antibiotics for infection [31]. The treatment strategy followed in the current study was as the following, > 24% of the cases were subjected to minor or major amputation. This figure is very close to that which was found by the previous research which reported that up to 28% diabetic foot end up with amputation (Hinchliffe., *et al*. 2008). A study done in Saudi Arabia found that 20.9% of the included patients had to be treated with amputation [32].

This study does not include any data about offloading, immobilization or physical activity of patient with diabetic foot ulcer. As this issue is surrounded by long debate, some researchers suggest that immobilization and offloading of patients is very important factor for healing of the ulcer. They referred ulcer occurrence to a triad of risk factors which are neuropathy, ischemia and pressure [33]. Based on this opinion, some argue that offloading has been shown to be beneficial, however, no agreement about the duration of this policy [34]. The researcher supporting exercise speculated that this option will improve the overall survival of diabetic patients and reduce cardiovascular related mortality.

They defended their opinion considering the fact of around 15% of people with diabetic foot ulcers may have lost a leg after 10 years, but up to 70% will have died and over half of these deaths are vascular related [35].

According to the available research, diabetic foot problems occur commonly due to vasculopathy which affects the tibial and peroneal arteries of the calf. Doppler Ultrasound Colour method is valuable, non-invasive tool that may provide good information about the anatomy and physiology of the vessels [36]. Unfortunately, More than 70% of patients have not done Doppler ultrasonography, this was significant because it is not an ideal practice, as Doppler Ultrasound is considered as an important indicator of health care services provided to diabetic patients. Because of the severity of infection and presence of pathology in Doppler ultrasonography were related to poor outcome such as amputation, therefore, it is strongly recommended that all patients with diabetic foot should be screened with Doppler ultrasonography to identify those at risk for amputation [37].

Radiological imagining (x-ray) was done to majority of the participants of this study. It was normal in most of them, and showed osteomyelitis in 12.2%. A previous study found that the osteomyelitis is present in approximately 70% of ulcers that can be probed to bone [38].

Diabetes mellitus is a chronic non -communicable disease with life threatening complications, including peripheral neuropathy and limb ischemia. Diabetic foot ulceration is well recognized problem. In order to control this problem and improve the quality of life in diabetic patients the risk factors should be identified and addressed. The risk factor for foot ulceration increased in people having diabetes of more than 10 years duration, male gender, patients with poor glycaemic control, and those having cardiovascular, retinal or renal complications [32]. In our study we found, 58.2% of the sample have been diabetic for more than 10 years, and more than half of the patients have diabetes mellitus only. The renal disease is present only in 11.2% of the sample.

Conclusion

Peripheral arterial disease is one of the most common foot problems and develops frequently in diabetic patients, Neuropathy is often a predisposing factor to ulceration and amputation. Unfortunately, many of the patients who develop foot ulcer will require amputation within the foot, or above the ankle as a consequence of severe infection or peripheral ischemic disorders. This study concluded that, a notable difference in the selection of appropriate management between the patients aged 50 years or less and those whose age is more than 50 years, in which more cases of relatively aggressive surgical intervention such as major amputations was applied to the age group of more than 50 years and no conservative

management was done to them compared to younger age group, however this difference does not show statistical significant.

Duration of diabetes for more than 10 years is insignificantly associated with increased chance of having collection, foot ulcer, and wet gangrene. In addition, it shows significant association of having renal disease.

The male patients were subjected to more likely to have aggressive surgical option compared to females. This difference does not reach statistical significance. The older age group is significantly associated with greater chance of having other chronic illness beside diabetes.

Recommendations

- Early diagnosis and control of risk factors are essential to prevent diabetic foot complications.
- The studies have shown that amputation rate can be reduced more than 50% by early diagnosis of peripheral vascular disease and vascular intervention [39].
- All patients with diabetic foot should be screened with Doppler ultrasonography (DUSG) to identify those at risk for amputation.
- Further studies are needed with greater sample and prospective design to ensure complete data.

Limitation and Weaknesses

Most patient`s files were found with incomplete and missing data. For example, Culture results and Doppler ultrasonography, were not documented in all files. This might be referred to the time of data collection during the war situation in the city.

Moreover, working in trauma hospital at war time with very limited staff, all these factors made the priority of investigation, management of serious and urgent cases for the military patients and war victims.

Therefore, the following information was missing:

- Data about education level.
- Data about glycaemic control.
- Inflammatory indicators e. g. ESR, CRP.
- Culture results.
- Doppler study was missing in great percentage in this study.

Appendix: Diabetic foot questionnaire

Baseline data

Serial No.	**Name**
Age	Sex
Duration of diabetes	Smoking
Other co-morbidity : only DM	DM and HTN
Other chronic diseases:	
Medications:	

Clinical data

H/O Previous admission Due to DF	**Frequency**	**H/O debridement**
H/O amputation	Minor	Major
	Multiple	
Current admission	Diagnosis (not infected)	
Ulcer	Sore	Blister
Surgical treatment		
WBCs	CRP	ESR
Culture result (infected)		
Urea	Creatinine	
Foot x ray	Done /normal	Osteomylitis
	Charcot joint	Not done
Doppler USG	Not done	Done normal
	Atherosclerosis	Mild stenosis
Major stenosis	Level/ artery name	
Surgical intervention in the current admission	Conservative	I/D
	Debridement	Minor amputation
	Major amputation	Multilevel amputation

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