

Wound Healing Complications Associated with the Lower Limb Amputation in
Baghdad City

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Abstract:

A descriptive (cross sectional) study, quantitative design, was carried out at Baghdad Teaching Hospital and Al- Karama Teaching Hospital for the period of February 2014 up to July 2015.

(Non-Probability) purposive sample of (57) patients who are suffer from wound healing complication of lower limb stump. The study objectives are to assess the complications which are associated the lower limb amputation in Baghdad City, to describe the Sociodemographic characteristics of the study sample such as (Age, Gender, level of education, monthly income, and occupation), and to determine the levels of lower limb amputation of the study sample.

The data were collected through the use of constructed questionnaire, which consisted of (3) parts which include the socio-demographic data of the study sample, information about amputation, and the complications which are associated with the wound healing of lower limb stump. The content validity of the instrument was established through penal of (8) experts. Reliability of the instrument was determined through the use of stability reliability, test and re-test approach, ($r=82$).

Data was collected by interview technique using the questionnaire formal and data was analyzed by application of descriptive and inferential statistical method.

The results of the study indicate that the study sample experience pain and redness of the stump and the main cause of amputation was diabetes mellitus, and the most level of amputation was above knee joint. The study recommended Preparation of an educational program for amputee's patients about special care regarding diet, medication and family caregiver. And conducting qualitative research to gain deeper insight in to each part of care especially focusing on the complication associated with the lower limb infection.

Keywords: Wound, Complication, Amputation.

Introduction:

Amputation is the surgical severing of any body part. Amputation of the lower limb can be surgical (therapeutic) or traumatic (emergencies resulting from injury), it is either open (guillotine) or closed (flap) (**Sommers, et al., 2007**). Amputation is performed to remove ischemic, infected, necrotic tissue or locally unrespectable tumor, and at times, is a life-saving procedure (**Kalapatapu, 2015**).

Complication that may occur with amputation includes hemorrhage, infection, skin breakdown, phantom limb pain, bleeding, delayed healing, hematoma, and necrosis. The risk for infection increases with contaminated wounds after traumatic amputation. (**Brunner and Suddarth, 2008**). Infection can pose serious complications for the amputee. However, studies have demonstrated that in those patients specifically undergoing lower extremity amputation (**Cerveira, 2003**).

Other factor can influence healing include uncontrolled diabetes mellitus, chronic respiratory disorders. It is a particular risk in order clients who more likely to have chronic disease such as peripheral vascular disease, smoking also are risk factors for delayed healing (**Burke, 2007**).

In context of limb amputation wound, pain is a significant problem. It is thought that pain experienced after an amputation may scare and confuse patients (**Gibson, 2001**). Amputees can experience two different types of pain: incisional stump pain and phantom pain (**Gupta, 2002**).

Stump pain is localized to the area immediately around the stump and the amputation scar and is described by patients as 'pressing', 'throbbing', 'burning', and 'squeezing'. While phantom pain is a common problem, affecting between 8% and 10% of patients, and is usually reported during the immediate postoperative period but can persist for up to two years. Development of tissue necrosis due to poor tissue perfusion. The tissue essentially becomes non-viable and can be clinically observed as dusky skin changes (**Jensen and Nikolaisen, 1999**).

Mottled/purple discoloration, dry gangrene, wet gangrene or sloughy tissue. Such discoloration or cyanosis of the skin at the incision line can result in wound breakdown soon after surgery or even skin necrosis in the non-viable areas several weeks later (**Ray, 2000**).

A haematoma is a localized collection of blood which can form in an organ, space or tissue. It acts as a focus for infection and can create dead space, weakening the suture line. And thus increasing tension in the wound, in most cases they drain on their own, without the need for surgical intervention, however large amounts of clotted blood may warrant prompt surgical debridement, wound with no drainage may be at risk of haematoma formation under the suture line, causing tension and edema at the wound site, as well as providing ideal conditions for bacterial growth (**Stringfellow, and Cooper, 2000**), after amputation the skin can experience a number of problems involving the skin surrounding the wound. Skin breakdown, blistering can occur, the epidermis is separated from the dermis as a result of repeated friction to the skin (**Jester, 2000**).

Wound healing complications associated with the stump of an amputee are important because in some cases these determine a patient's ability to walk with prosthetic limb (**White, 2001**).

Wound associated with amputation of lower extremity continues to be a challenge. Patients who endure such wounds are often in poor health, with coexisting medical

pathologies. Wound healing outcomes for amputees can be improved through multidisciplinary teams working together, such healthcare professionals need to be equipped with the appropriate knowledge and skills in wound management to meet the needs of this vulnerable patient. (Harker, 2006)

Patients and methods:

This is a descriptive (cross sectional) study; Quantitative design was conducted in the Baghdad Teaching Hospital and Al- Karama Teaching Hospital in Baghdad City, the aim of the study is to assess the complications which are associated the lower limb amputation in Baghdad City, to describe some of the Sociodemographic characteristics of the study sample such as (Age, Gender, level of education, monthly income, and occupation), and to determine the levels of lower limb amputation of the study sample.

The study was carried out during the period of February 2014 up to July 2015.

A non-Probability purposive sample of (57) patients who are suffer from wound healing complication of lower limb stump.

The criteria of the sample involved Adult patients (Males and females) who are experience complications of lower limb amputation at Baghdad and Al- Karama Teaching Hospitals.

Table (1): Distribution of the study sample by their setting:

Setting	Male	Female	Total
Baghdad Teaching Hospital	11	7	18
Al- Karama Teaching Hospital	25	14	39
Total	36	21	57

For the purpose of data collection, a questionnaire was constructed and contains of (3) parts which include the socio-demographic data, information about amputation, and the complications which are associated with the wound healing of lower limb stump, these parts include (16) items. The content validity of the questionnaire was determined through a panel of (8) experts. Reliability of the instrument was determined through the test and (re-test) approach, ($r=82$).

The data were collected through the utilization of constructed questionnaire, interview technique with the patients, and the data were organized and coded into computer files by using the Statistical Package for Social Science (SPSS) (V.20)

Data were analyzed through the application of the following statistical data analysis approach:

1. Descriptive Statistics / This approach were applied through the measurement of the following:

- a. Frequencies (F)
- b. Percentages (%)

2- Inferential Statistical.

This approach was applied through the measurement of the following

- a- Cronbach alpha correlation coefficient was employed for the determination of the instrument reliability
- b- Means of score

The levels of severity of items of each sub item were determined as following: Low Level = (1-1.66), Moderate Level = (1.67-2.32); and high level = (2.33-3)

Results

Table (2): Distribution of the study sample by their Sociodemographic characteristics.

Age (Years)	F	%
Less than 20 years	1	1.75
20 - 29	3	5.26
30 - 39	2	3.5
40 - 49	7	12.28
50 - 59	12	21
60 years and older	32	56
Total	57	100
Gender	F	%
Male	36	63.15
Female	21	36.85
Total	57	100
Level of education	F	%
Illiterate	23	40.35
Read and write	13	22.8
Primary school graduate	11	19.3
Intermediate school graduate	6	10.52
High school graduate	1	1.75
Institute graduate	0	00
College & Post Graduate	3	5.26
Total	57	100
Monthly income	F	%
Sufficient	5	8.8
Barely Sufficient	22	38.6
Insufficient	30	52.6
Total	57	100
Occupation	F	%
Government employee	3	5.26
Self-employed	12	21
Retired	18	31.6
House wife	17	29.9
Out of work (jobless)	7	12.3
Total	57	100

This table reveals that the highest of the sample were illiterate male on age 60 years and older, with insufficient monthly income, job of them was house wives and retired (29.9% and 31.6%) respectively.

Table (3): Level of amputation of the study sample:

No.	Level of amputation	F	%
1.	Above Knee joint	35	61.4
2.	Below Knee joint	4	7
3.	Syme (modified disarticulation of the ankle)	2	3.5
4.	Toe	9	15.8
5.	Foot (Amputation of part of the foot and toes)	7	12.3
Total		57	100

This table reveals that the highest level of amputation was Above Knee joint (61.4).

Table (4): Mean of score and severity of the study sample by their Potential wound healing complication associated with amputation.

No	Scale Complication	Always (3)		Sometimes (2)		Never (1)		Total	M.S	Std. Deviation	Severity
		F	%	F	%	F	%				
		Infection									
1.	Experience fever	12	21	36	63.1	9	15.8	57	2.0	.783	M
2.	The skin of wound surrounding the stump is red color	37	64.9	12	21	8	14	57	2.5	.796	H
3.	Severe pain on touched or move.	33	57.9	16	28	8	14	57	2.4	.818	H
4.	Pus drainage from the healing spot	9	15.8	11	19.3	37	64.9	57	1.5	.838	L
5.	Bad odor from the wound	13	22.8	5	8.8	39	68.4	57	1.5	.830	L
Delayed healing											
6.	Do you smoke	18	31.6	3	5.3	36	63.1	57	1.7	.885	M
7.	Do you experience diabetic foot	42	73.7	0	00	15	26.3	57	2.5	.907	H
8.	Deep vein thrombosis	37	64.9	2	3.5	18	31.6	57	2.3	.701	M

9.	Do you consume proper nutrition	28	49	12	21	17	29.8	57	2.2	.755	M
Stump pain and Phantom pain											
10.	Stump pain	31	54.4	11	19.3	15	26.3	57	2.3	.802	M
11.	Tingling in the stump	28	49	13	22.8	16	28	57	2.2	.789	M
12.	Numbness in the stump	22	38.6	7	12.3	28	49	57	1.9	.772	M
13.	Itching in the phantom foot	13	22.8	9	15.8	35	61.4	57	1.6	.742	L
14.	Burning and squeezing (pressing pain).	22	38.6	13	22.8	22	38.6	57	2.0	.791	M
Tissue Necrosis											
15.	Dusky skin changes.	8	14	1	1.8	48	84.2	57	1.3	.872	L
16.	Mottled/purple discoloration.	13	22.8	4	7	40	70.2	57	1.5	.851	L
17.	Dry gangrene.	3	5.3	2	3.5	52	91.2	57	1.1	.885	L
18.	Wet gangrene.	5	8.8	0	00	52	91.2	57	1.2	.913	L
19.	Sloughed tissue.	6	10.5	2	3.5	49	86	57	1.3	.862	L
20.	Cold and painful stump.	34	59.6	10	15.8	13	24.6	57	2.4	.833	H
Hematoma											
21.	Swelling on the stump	18	31.6	3	5.3	36	63.1	57	1.7	.805	M
22.	Hematoma formation under the suture line causing tension.	13	22.8	2	3.5	42	73.7	57	1.5	.690	L
23.	Edema surrounded the stump	9	15.8	4	7	44	77.2	57	1.4	.756	L
24.	Blood drainage from the stump	5	8.8	4	7	48	84.2	57	1.2	.731	L
Wound and skin breakdown											
25.	The area surrounded the wound is sensitive.	23	40.4	8	14	26	45.6	57	1.9	.782	M
26.	The area surrounded the wound is painful.	33	57.9	8	14	16	28	57	2.3	.776	M
27.	There is pus drainage from the stump.	5	8.8	2	3.5	50	87.7	57	1.2	.734	L
28.	Blistering surrounded the wound.	9	15.8	1	1.8	47	82.5	57	1.3	.708	L

This table reveals that the mean of scores is highly significant on items (2, 3, 7, and 20), and moderate significant on items (1, 6, 8, 9, 10, 11, 12, 14, 21, 25, and 26), while low significant on the remaining items.

Discussion

Throughout the course of data analysis, table (1) revealed that the most of the study sample was on male (63.15%), with age 60 years and older (56%), this finding is come along with the Global Lower Extremity Amputation Study Group who stated that The incidence of amputation is higher in smokers, rises steeply with age, with most amputations occurring in patients aged more than 60 years, and is higher in men than women (**Global Lower Extremity Amputation Study Group, 2000**). Almost half of the study sample was illiterate (40.35%) and more than the half (52.6%) of them retired suffer from insufficient monthly income. It is a fact that illiterate person is more liable to get diabetes than the educated one which is the main reason lead to amputation. Educated persons are able to get benefit from the resources that are available compared to illiterate patients. Also, they are more likely to have good self-care knowledge and practices, because stronger problem-solving and coping capacities arising from educational experience (**Almutairi, et al., 2013**). Actually, it has been found that amputees patients need special care regarding diet, medication, mobility, and most of patients are retired or not working because of their health condition. Limited family income is a problem faced by many patients that adversely affects their disease outcomes and ability to self-manage their illness (von Goeler *et al*, 2003). Regarding to the level of amputation, the present study showed that the majority of level of amputation was above knee joint (61.4%), (Table 3). Amputation is performed at a number of different levels, determining the ideal level of amputation for a patient depends on a number of factors. A holistic assessment considers factors such as healing potential, rehabilitation potential, prosthetic considerations, the patient's own wishes, and discharge arrangements. (**Datta, D., Amputation, rehabilitation and prosthetic developments. In: Beard JD, Gaines PA, editors. 2001**). The present study revealed that the redness of the skin surrounding the wound of the stump, the severe pain on touched or move of the stump and coldness of the stump, get a high significant level of severity (table 4).

This finding is in agreement with Stringfellow, et al, who mentioned that wound infection can be problematic, resulting in swelling, pain, pus formation, erythema, heat, sometimes accompanied by fever, leading in severe cases to septicemia, and breakdown of the suture line (**Stringfellow and Cooper, 2000**). In the context of lower limb amputation wounds, pain is a significant problem. It is thought that pain experienced after an amputation (**Donohue, et al., 2001**). Amputees can experience two different types of pain: incisional stump pain and phantom pain. Stump pain is localized to the area immediately around the stump and the amputation scar (**Ellis, 2002**) And Phantom pain is a common problem, affecting between 8% and 10% of patients (**Hill, 1999**).

On the other hand **Ray, (2000)** stated that skin of the stump clinically observed as dusky skin changes, mottled/ purple discoloration, or cyanosis of the skin at the incision line. The latter is often cold and very painful.

The finding of the present study revealed that the study sample experience diabetic foot with highly severity (table 4). This finding was supported by (Dormandy, et al., 2001), who found that approximately 85-90% of lower limb amputations in the developed world are caused by peripheral vascular disease, with the remaining amputations caused by infection secondary to diabetic foot ulceration (**Donohue, et al., 2001**). Wounds associated with amputation of the lower extremity continue to be a challenge.

Conclusion:

The study concludes that most of the study sample was elderly married male with insufficient monthly income; their job was retired, and house wives. The majority of their level of amputation was above knee joint. Also the present study revealed that the majority of the study sample was experience diabetes mellitus, redness of the skin surrounding the wound of the stump, severe pain on touched or move of the stump and coldness of the stump, which get a high significant level of severity.

Recommendations:

- 1- Preparation of an educational program for amputee's patients about special care regarding diet, medication and family caregiver.
- 2- Nurses have to using sterile technique during dressing to avoid inflammation of the stump.
- 3- Improvement of education about self-care knowledge and practices about causes, prevention, outcomes and control of diabetes through media.
- 4- Conducting qualitative research to gain deeper insight in to each part of care especially focusing on infection control in the Hospitals.

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پوخته

کاریگه‌رییه لاهه‌کییه‌کانی چاکبوونه‌وهی برینی برینه‌وهی قاچ، له شاری به‌غدادانه‌م توژیینه‌وهیه، توژیینه‌وهیه‌گی زانستی وه‌سفییه له‌سه‌ر بنه‌مای چه‌ندایه‌تی، له نه‌خوشخانه‌ی فی‌رکاریی به‌غدادو نه‌خوشخانه‌ی فی‌رکاری که‌رامه له شاری به‌غداد له ماوه‌ی شوباتی ۲۰۱۴ و بۆ ته‌موزی ۲۰۱۵، کراوه.

نامانجی ئەم توژیینه‌وهیه، هه‌سه‌نگاندنی ئەو کاریگه‌رییه لاهه‌کییه‌کانی که له چاکبوونه‌وهی برینی برینی قاچی نه‌خوش ده‌که‌ونه‌وه، له شاری به‌غداد، هه‌روه‌ها بۆ دیاریکردنی تایبه‌تمه‌ندییه دیموگرافییه‌کانی سمپلی توژیینه‌وه‌که‌یه وهک (ته‌مه‌ن، په‌گه‌ز، ناستی رۆشن‌بیری، داها‌تی مانگانه، پیشه‌و، دیاریکردنی ناستی ئەو برین و لیکه‌وتانه‌یه که له برینه‌وهی قاچی نه‌خوشه‌کان ده‌که‌ونه‌وه.

بۆ گه‌یشتن به نامانجه‌کانی توژیینه‌وه‌که، سمپلیکی مه‌به‌ستدارانه‌ی نا نه‌گه‌رانه ده‌ست‌نیشان‌کراوه، که له (۵۷) نه‌خوش پی‌کدی‌ت، له‌وه نه‌خوشانه‌ی که دو‌چار ی برینی دوا‌ی برینه‌وهی قاچیان بوون. به‌مه‌به‌ستی کۆکردنه‌وهی زانیارییه‌کان فۆرمیکی زانیاریمان دیاریکردوو و له سێ بره‌گه‌ پی‌کدی‌ت و باب‌ه‌ته‌کانی: تایبه‌تمه‌ندییه دیموگرافییه‌کانی نه‌خوشه‌کان و زانیاری په‌یوه‌ست به قاچ و ئەو کاریگه‌رییه لاهه‌کییه‌کانی له برینه‌وهی قاچ ده‌که‌ونه‌وه، له خۆ ده‌گرت. ئەم فۆرمه خراوته به‌ر ده‌ستی (۸) شاره‌زا بۆ دلناییی له‌پاستی. به‌به‌کاره‌ینانی لیکۆلینه‌وهی به‌لگه‌یی به‌ میتۆدی تاقیکردنه‌وه و دووباره تاقیکردنه‌وه (test and re-test) و به‌کاره‌ینانی (هاوکۆله‌ی هاوپه‌یوه‌ندی پیرسون) دیاریکراوه، (۲= 82) نه‌گۆری دیاری کرا، هه‌روه‌ها میتۆدی دیدارو چاوپیکه‌وتنی که‌سیی راسته‌وخۆیش له‌گه‌ل سمپلی توژیینه‌وه‌که‌دا په‌یوه‌کراوه. دواتر زانیارییه‌کان کۆکراونه‌وه به‌به‌کاره‌ینانی شیکاری وه‌سفی و شیکاری رینوینی شیکراونه‌ته‌وه. له‌دوا‌ی شیکردنه‌وهی زانیارییه‌کان توژیینه‌وه‌که گه‌یشتۆته ئەوه‌ی که سمپلی توژیینه‌وه‌که دو‌چار ی نازارو سوربوونه‌وه ده‌بن، زۆربه‌ی زۆری ئەم حاله‌تانه‌یش له لاقه‌کاندا بۆ بوونی نه‌خوشی شه‌کره‌ی لای ئەم نه‌خوشانه ده‌گه‌رینه‌وه، هه‌روه‌ک ئەوه ده‌رده‌که‌وت له‌م توژیینه‌وه‌دا که زۆربه‌ی برینه‌وه‌کان سه‌روی جوگمه‌ی ئەژنۆ ده‌گرتیه‌وه. توژیینه‌وه‌که چه‌ند راسپاردیه‌ک ده‌خاته‌روو له‌وانه، دانانی پرۆگرامیکی هۆشیارکردنه‌وه بۆ نه‌خوشه‌کان و ئەوانه‌ی چاودێریان ده‌که‌ن له‌باره‌ی بایه‌خ‌دان به‌ شوینه‌ بره‌وه‌که‌و چۆنیتی پاک‌کردنه‌وه‌و جووری خواردن و شیوازی چاره‌سه‌رکردنی نه‌خوشه‌که، لیکۆلینه‌وه‌که ئەوه‌ش ده‌خا‌وا‌یت که لیکۆلینه‌وه‌یه‌کی تری زانستی تایبه‌ت بکری‌ت به‌ چۆنیتی کۆنترۆلکردنی هه‌وره‌کردن له نه‌خوشخانه‌کاندا.

الخلاصة:

اجريت دراسة وصفية مقطعية ذات تصميم كمي في مستشفى بغداد التعليمي ومستشفى الكرامة التعليمي في مدينة بغداد للمدة من شباط ۲۰۱۴ لغاية تموز ۲۰۱۵.

تهدف الدراسة الى تقييم المضاعفات المصاحبة لالتئام جروح بتر الأطراف الأسفل في مدينة بغداد، لتحديد الصفات الديموغرافية لعينة البحث مثل (العمر، الجنس، المستوى الثقافي، الدخل الشهري، وكذلك المهنة) ولتحديد مستويات بتر الطرف الأسفل لعينة الدراسة. ولتحقيق اهداف الدراسة اختيرت عينة غرضيه غير احتمالية مكونة من (۵۷) مريضاً ممن يعانون من مضاعفات في جروح جدعة الطرف الأسفل. ولغرض جمع المعلومات صممت استبانته مكونة من (۳) اجزاء شملت الخصائص الديموغرافية لعينة البحث ومعلومات عن البتر وكذلك بعض المضاعفات التي تصاحب البتر. عرضت الاستمارة على (۸) خبراء لتحديد الصدق. وحدد الثبات باستخدام معامل بيرسون وبطريقة الاختبار واعادة الاختبار، وكان (۲= ۸۲) وبطريقة المقابلة الشخصية مع عينة البحث جمعت المعلومات وقد حلت باستخدام التحليل الوصفي كذلك التحليل الاستنتاجي ومن خلال التحليل بينت الدراسة ان مرضى البتر يعانون من ألم واحمرار في الجدعة وان اغلب البتر في عينة البحث سببه مرض السكر كذلك بينت الدراسة ان اغلب البتر هو فوق مفصل الركبة. هذا واوصت الدراسة بتخصيص برنامج تثقيفي للمرضى والقائمين على الرعاية بهم حول العناية بالجدعة من حيث التعقيم والتغذية والعلاج، كذلك اوصت الدراسة ببحوث اخرى نوعية حول السيطرة على المضاعفات المصاحبة لالتهابات جروح الطرف الاسفل.