

Clinical orthopedic and rehabilitation assessment of lower limb amputees veterans in Mazandaran province

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Abstract

Aims: Correct identification of limb amputee veterans' health and treatment needs can have a significant effect on complications' decrease and also increase in their quality of life and life expectancy. This study was performed in order to determine the frequency of clinical and rehabilitation assessment results in limb amputee veterans in Mazandaran province.

Methods: This cross-sectional descriptive study was performed on limb amputee veterans who referred to the specialized clinic affiliated to Foundation of Martyrs and Veterans Affairs of Mazandaran province in years 2006-7. From the 375 amputee veterans' medical files, 295 entered the study and the rest were excluded. All clinical orthopedic and rehabilitation evaluations of amputee veterans were done by an orthopedist and a rehabilitation specialist in mentioned clinic. Data were documented in a researcher-made questionnaire and were analyzed using descriptive statistics by SPSS 16 software.

Results: 168 (56.9%) of lower limb amputee veterans complained of lower limb pain, 65 (22%) complained of skin infection, and 58 (19.7%) complained of neuroma in site of amputated limb. Change or repair of lower extremity prosthetics with 253 (76.85%) requests, was the most frequent therapeutic command.

Conclusion: It seems that majority of veterans don't have acceptable physical strength and capabilities and this fact has reduced their quality of life. Therefore, appropriate protection and rehabilitation measures are recommended for this group of veterans.

Keywords: Limb Amputee Veterans, Clinical Orthopedic Assessment, Clinical Rehabilitation Assessment

Introduction

Disability is defined as one's deprivation and poor condition as a consequence of weakness and disability, so that it prevents the person to perform a normal task considering his age, sex, social and cultural conditions. Meanwhile, motor disabilities have the highest prevalence [1]. Nowadays, the major causes of motor disabilities are peripheral vascular diseases, injuries, infections, tumors and congenital anomalies all over the world. Often amputations in the people under 50 years old happen as a result of trauma and injuries related to accidents, industrial incidents or war in developing countries [2]. Lower limb amputation includes approximately 85% of total amputations which may happen at a single limb or both lower limbs [3]. War is an important issue in the public health of the society and its fatalities and its heavy destructions usually lead to permanent long-term effects on the body and mind of people. Among these issues is the veterans' quality of life, which has been subjected to danger due to lack of enough attention to

their primary health, treatment and rehabilitation needs [4]. Amputation in veterans, like the other patients suffering from chronic diseases, can affect other aspects of their life and it has intensive and visible effects on general health, mental health and quality of patients and their families' life especially boys and girls [5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17].

Today, quality of life is considered as one of the indicators for assessing rehabilitation services and health and welfare programs. Determinant factors of quality of life in objective dimensions include age, sex, socioeconomic status, social communication, housing, income, occupation, behavioral capabilities, social skills, functional and biological abilities and physical and mental status. These factors in mental dimension include the human perception of quality of life, self-confidence, independence and introversion and extroversion characteristics of the person [18, 19, 20, 21, 22, 23, 24, 25, 26]. In assessing the quality of life, humanitarianism is considered as a basis for measurement. Therefore, the correct identification of

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health-treatment problems and needs and rehabilitation of these groups of veterans can have significant effects on reducing complications and also on increasing their quality of life and life expectancy [5]. This study was designed to determine the frequency of clinical and rehabilitation results of the amputated veterans in Mazandaran province in years of 2006-7 hoping that it is the basis for interventional research projects to improve quality of life and health indicators in the amputated veteran population in Mazandaran province.

Methods

This is a cross-sectional descriptive study. Population of the study was amputee veterans referred to the specialized clinic affiliated to Foundation of Martyrs and Veterans Affairs of Mazandaran province in the years of 2006-7. From among 375 amputee veterans' medical files in the Health Department of Foundation of Martyrs and Veterans Affairs of Mazandaran province, 269 veterans (78.66%) with the simple method or the gradual entry were invited to participate in this study and were completely and scientifically evaluated by an orthopedist and a rehabilitation specialist.

A researcher-made questionnaire with short structure was used for data collection. This questionnaire included the demographic information (age, sex, education level, employment status and characteristics of veterans), clinical examinations and rehabilitation examinations. The quality of the participated veterans' life was evaluated based on two questionnaires of the level of the active daily skills and the progress level of the active daily performance. This study was conducted after taking the confirmation and permission of the authorities. The participants' information was extracted after the study of their medical records, and was inserted in the anonymous questionnaires. Statistical calculations were done by SPSS 16 software, and the descriptive statistics was used to calculate and determine the frequency of demographic characteristics and the needs of veterans under study.

Results

The mean age of 295 samples was 41.77±5.9 years old and their age range was between 34 and 74 years old. All participants were male. 249 subjects (84.4%) were diploma or under high school and 61 subjects (20.7%) were unemployed. The average percentage of their disability was 48±12.62% and its range was 13-75% while most of them (44%) were in the disability

percentages of 41-60% (Table 1). Based on the available data, the amputations of the veterans were done at different levels. 8 subjects of this study (2.71%) had double lower limb amputation, so that 2 subjects (0.67%) had below the knee double amputation, 2 subjects (0.67%) had below the knee double and on the knee amputation, 3 subjects (1.01%) had below the knee double and above the knee amputation and 1 subject (0.33%) had the ankle double and above the knee amputation (Table 2).

Table 1- Demographics of lower limb amputee in this study

	Characteristics	Number	Percentage
Age groups (year)	34-44	230	78
	35-54	53	18
	55-74	12	4.1
Education	Illiterate and primary school	65	22.1
	Secondary school	89	30.2
	High School	15	5.1
	Diploma	80	27.1
	Higher than diploma	46	15.6
Occupational status	Unemployed	61	20.7
	Employed	105	35.6
	Retired	31	10.5
Percentage of veterans	Employment plan	98	33.2
	13-40	112	38
	41-60	130	44
	61-75	53	18

Table 2- The frequency of the characteristics of the amputation levels of the veterans with lower-limb amputation in this study

	Characteristics	Number	Percentage
The cut surface of each lower limb	Finger and Metatarsal bones	3	1
	Lisfrance or neae the Tarsometatarsal	9	3.1
	Chopart or near the Tarsal bones	7	2.4
	Pirigof or near the bone Tarsal	7	2.4
	Ankle	36	12.2
	One fourth of distal tibia	34	11.5
	One second of middle tibia	49	16.6
	One fourth of proximal tibia	88	29.8
	Near the knee joint	8	2.7
	On knee	14	4.8
	One third of distal femur bone	27	9.1
	One second of middle femur bone	15	5.1
	One third of upper femur bone	6	2
	On Hip joint	6	2
	Hemiploktomy	0	0
The double lower-limb cut surface	One side's toe with the opposite side's foreleg	5	1.7
	One side's toe with the opposite side's upper-knee	1	0.3
	One side's foreleg with the opposite side's foreleg	3	1
	One side's knee-face with the opposite side's foreleg	2	0.7
	One side's upper-knee with the opposite side's foreleg	3	1

Table 3- The frequency of the clinical complications of the veterans with lower-limb amputation in this study

Characteristics		Number	Percentage
Clinical complications of the remained limbs	Cook syndrome	1	0.3
	Skin infection	65	22
	Contact skin rash	6	2
	Bone spur	13	4.4
	Pain	168	56.9
	Phantom pain	9	3.1
	Neuroma	58	19.7
	Phantom sensation	9	3.1
	Contraction	9	3.1
	Hands' fingers	7	2.37
Motor limitation in joints	Wrist	2	0.67
	Elbow joint	4	1.35
	Shoulder joint	6	2.03
	Ankle	13	4.4
	Knee joint	23	7.79
Deformity of vertebrae	HIP joint	8	2.71
	Esclioz	100	33.89
	Kiphosis	50	16.94
	<i>Kyphoscoliosis</i>	1	0.3
	Lordosis	15	5.08

Most clinical complications in the remained limb included: pain, skin infections and neuroma at the end of the amputated limb, respectively. The motion restrictions were reported mostly in knees and ankle joints. The deformities of the spine were reported more as Kyphosis and Scoliosis among these veterans (Table 3). 282 veterans (95.6%) were using various types of lower extremity prosthetics. Frequency of prosthetics used by veterans with lower limb amputations is shown in Table 4.

Table 4- Frequency of the prostheses types of veterans with lower-limb amputation in this study

Characteristics		Number	Percentage
Prosthesis of Foot area	Special shoes	8	2.71
	Prosthetic claws	18	6.1
	Total	26	8.81
Prosthetic of ankle area		30	10.16
Prosthesis of Leg or below the knee	Modular types	4	1.35
	Pedilin type	175	59.32
	Total	179	60.67
On the Knee Prosthesis		12	4.06
Above the Knee Prosthesis		45	15.25
Hip Prosthesis		4	1.35
No Prosthesis		13	4.4

Regarding the quality of life, there were some deficiencies in the rehabilitation of the mentioned veterans. 148 veterans (50.2%) were unable to stand without pain more than 5 minutes. Only 79 veterans (26.8%) were able to run 100 to 500 meters without getting tired (Table 5).

The treatment orders existed in the medical files of lower limb amputee veterans were divided into five

main groups; So that each of these major groups was defined for the elimination of specific clinical symptoms. The requested items included: maintaining the stamp, reducing the phantom pain by the electrical devices, increasing the muscle power and increasing the level of physical ability, the corrective movements to compensate the deviations of the different parts of body and finally the lower extremity prosthetics and then were performed (Table 6).

Table 5- Frequency of life quality in the veterans with lower-limb amputation in this study

Characteristics		Number	Percentage	
Amount of daily active skills	Putting on and off the clothes and prosthesis independently	241	81.7	
	Changing from sitting to standing position	244	82.7	
	Using the stool-type toilet for the bowel movement	222	75.3	
	Driving	88	29.8	
	Walking on the flat surfaces without a cane	137	46.4	
	Walking on the uneven surfaces and stairs with a cane	121	41	
	Walking on different levels without a cane	82	27.8	
	Always walking with a cane connectable to elbow crutches	73	24.7	
	The rate of progress in the daily active performance	Less than 5 minutes	148	50.2
		Time of standing without pain (range of 0-120 min)	5-15 minutes	72
15 -30 minutes		36	12.2	
30-60 minutes		27	9.2	
More than 60 minutes		12	4.1	
Distance of walking without fatigue (distance range of 0-5000 m)		No distance	69	23.4
		Up to 100 m	69	23.4
		100-500 m	79	26.8
500-1000 m		51	17.3	
More than 1000 m		27	9.2	
Ability of bike riding		57	19.3	
Ability of Swimming		64	21.7	
Ability of climbing		34	11.5	

Discussion

As it was observed in this study, most veterans complained about the pain, skin infections, and neuroma. The main reason of these complications could be non-adjusted changes in the stamp's shape or size, the rubbing caused by soft socket with the skin or

the wrong making of socket. In various studies, these factors were known as the reason of similar symptoms on the amputee stamp [27]. Biomechanical studies on the lower extremity prosthetics sockets have shown that the socket is considered as the most important component in the prosthetic constrain with the prosthesis and its accurate and appropriate design is emphasized [28].

Table 6- The frequency of medical orders in the veterans with lower-limb amputation in this study

Therapeutic orders		Number	Percentage
Stamp maintaining	Physiotherapy and stamp massage	27	9.15
	Care of stamp skin	56	18.98
Reduce of phantom pain with electrical devices	Conventional methods	42	14.23
	Using high amplitude tense, low frequency or low amplitude, low frequency	20	6.77
Increase of muscle strength and increase of physical strength	Training of 1- aerobics	239	81.01
	strengthening 2- andorans	253	85.76
	movements 3-lumbosacral	157	53.22
	Doing stretching movements	83	28.13
Corrective motions to compensate	Doing sport and exercise movements	45	15.25
	Doing the active daily skills	59	20
Lower limb prostheses	Improving deviations	8	2.71
	Doing special exercise to help correct walking	38	12.88
	Prosthesis improvement	113	38.30
	Replacement of feet prosthesis	20	6.77
Lower limb prostheses	Replacement of ankle prosthesis	5	1.69
	Replacement of below the knee prosthesis	65	22.03
	Replacement of above the knee prosthesis	40	13.55

Since an appropriate socket is involved in the satisfactory transition of load, suitable stability and also the effective control in the movement, its design process is considered very important and sensitive and the affecting parameters should be evaluated properly [29].

According to the results of this study, scoliosis and kyphosis have also been observed as the most common clinical complications of limb amputee veterans in Mazandaran province. These complications could represent that the used prostheses were not suitable and they caused inappropriate transfer of body weight to the veterans' spinal and thus, has created these complications. Meanwhile, about half of amputee veterans had weak to moderate muscle endurance, muscles strength and aerobic capacity in muscles in years of 2006-7 which unfortunately represents the low level of rehabilitation

services to veterans in Mazandaran province. Since doing effective and regular physiotherapy and rehabilitation programs, physical ability of the amputee veterans would have improved and less physical complications would have been caused.

The majority of veterans under the study had weak to moderate daily skills and the progress of performance in daily activity. So that only half of them could stand for 5 minutes without feeling pain and more than half of them could walk 500 meters without fatigue. Only one-fifth of them could ride the bike, swim or climb mountains which all confirmed the lack of the acceptable ability and physical strength in the amputee veterans in Mazandaran province.

The kind of treatment requested for veterans conform the above items decisively. Over one-third of amputee veterans of Mazandaran province had underwent special treatment of stamp maintaining or the phantom pain reduction, or 836 therapeutic orders were requested just in order to increase the muscle ability and elevate the levels of physical ability of amputee veterans. These therapeutic commands beside asking for repairing or changing most prosthesis of the amputee veterans represented the inappropriate use of prosthetics in Mazandaran province. Most conducted studies in other countries, have considered inappropriate prostheses and deficiency of proper physiotherapy and rehabilitation treatments as the important and effective factors for increasing physical complications in the limb amputee veterans [5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17].

On the other hand, today the new rehabilitation approaches have changed the problem of disability from a personal tragedy to a social issue. In this attitude, disability is a restriction by the society that prevents the participation of these people in the social life. Nowadays, rehabilitation goals have gone beyond the disabled people's access toward the maximum personal ability, and have considered their social life and joining the community. Therefore, the purpose is delivering the services that improve the quality of disabled people and their families' lives and provide equal opportunities for the disabled people and their families together with their social development. Some studies show the effective role of training veterans, their families and people in the society in increasing and promoting the physical and mental health of veterans, thus improving the quality of their life. Unfortunately significant defects in the health system of Foundation of Martyrs and Veterans Affairs are witnessed today [18, 19, 20, 21, 22, 23, 24, 25, 26].

The limitations of this study included: doing the orthopedic and rehabilitation specialized visits based

on some non-standard clinical forms, lack of determined drug and treatment orders for the visited veterans based on a standard approach, inappropriate inserting of the clinical information in the visited veterans' profiles and lack of the complete coverage of all amputee veterans of Mazandaran province.

Following steps are recommended for improving the veteran status in Mazandaran province:

1) Recording valuable clinical information of the amputee veterans electronically in order to be used by researchers and officials of the governmental and non-governmental organizations (NGOs) in the health issues and rehabilitation of the veterans and the disabled people in national and global levels, 2) knowing real needs and priorities of health - treatment and rehabilitation of the amputee veterans, 3) having the necessary and primary information for developing comprehensive treatment programs, health and rehabilitation of the amputee veterans, 4) developing the comprehensive plan of the Veterans Health Information System and developing the Health ID for Veterans in Mazandaran province, 5) reducing the costs of health- therapy and rehabilitation of veterans, 6) improving the productivity and delivering the health-therapy services and the appropriate rehabilitation to the amputee veterans in Mazandaran province.

Conclusion

Most veterans did not have acceptable physical strength and capabilities and this fact reduces their quality of life. Therefore, the appropriate protection and rehabilitation measures should be undertaken for this group of veterans.

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