

Original Article

Evaluation of Early Psychological symptoms of Major Limb Amputation in a Tertiary Hospital

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ABSTRACT

Amputation may be used to treat a diseased limb or improve its function, and it is considered the last, albeit valuable option when limb salvage is impossible. The decision to amputate a limb is an emotional process for the patient and the patient's family. The result is often loss of economic power of the individual and his/her independence when not sufficiently rehabilitated back into the society. The aim of the study was to determine early psychological outcome of major limb amputation. This was a prospective study, where 54 consenting patients admitted via either the accident and emergency unit or general outpatient clinic of a tertiary hospital for major limb amputation that met the inclusion criteria were recruited into the study consecutively over a period of one year. They were assessed for depression with Mini International Neuropsychiatric Interview (MINI) Instrument, while Rehabilitation outcome was graded using functional independence measure. Intensive counseling with psycho education was commence before amputation and continues after amputation by counselors. Physiotherapy, occupational therapy, coping skills and other life skill training commence after amputation to 3 months of follow up. Only 1 (1.9%) of the respondents was diagnosed with major depressive episode out of the 54 that completed the study. Some of the remaining 53 (98.1%) had few symptoms of depression but did not fulfilled the diagnostic criteria for major depressive episode according to M.I.N.I. The rehabilitation of all the patients were good with a mean functional measure score of 117.59 (sd=3.328) and a P-value of 0.00 at discharge and even after follow up. Our findings show that early and proper rehabilitation of amputees seem to reduce their psychological symptoms. Tendency to get depressed following amputation is more common in the younger age group, female gender and in amputations as a result of trauma while rehabilitation seems better in same and vice versa.

Keywords: Amputation; Depression; Rehabilitation; limb

INTRODUCTION

Major limb amputation impacts negatively on patient's participation in valued activities, body image perception and quality of life.¹ It is preventable and occurs more frequently in the developing countries due to

inadequate preventive measures. Major limb amputation is the removal of part or the whole of a limb when done at or proximal to the wrist or ankle.^{1,2,3} Amputation is a triple insult that results in loss of function, body image and sensation. Multi disciplinary team approach to rehabilitation offers the most effective means for successful

re-integration of the patient with an amputated limb to their previous life style.⁴

Depression and anxiety are commonly reported after lower limb amputation and was previously thought to remain high for up to 10 years. Even though no good prospective data exists for levels of anxiety and depression beyond two years of follow up.⁵ Never the less evidence has shown that levels of both depression and anxiety are higher in amputees than the general population.⁵ Depression may vary in severity among amputees; where some may experience mild to moderate symptoms while others may experience severe or major depression. Igbal and colleagues in their write up revealed that 24.5% of amputees had major depression.⁶ These findings align with other writers who reported a prevalence of 15% in their study.⁷

According to researchers psychological reactions to amputation depend on a number of factors, which include age and sex, type and level of amputation, lifelong patterns of coping with stress, value placed on the lost limb, and expectations from the rehabilitation program.^{7,8} It's been noted that signs of depression are commonly higher in the younger age group than the elderly.^{6,8} Female amputees seem to be more affected than males when it comes to depression.^{8,9,10} The finding by Manoj *et al* suggested that in terms of causes of amputation, those due to trauma have higher depression scores and are more likely to be depressed than those amputees that had their amputations from a disease.^{8,11} A study done by Ali *et al* revealed that patients with above knee amputation had higher scores of anxiety and depression compared to patients who had below knee amputations. However, there was significant reduction in anxiety and depression scores following rehabilitation outcome in above knee amputation than below knee amputation.¹¹

Depression can be assessed using the Mini International Neuropsychiatric Interview (MINI) Instrument which makes use of the DSM-IV diagnostic criteria to make definitive diagnosis. It is a clinical interview that is more structured than usual, with very precise questions about psychological problems which requires a yes or no answer.¹²

Major limb amputees typically have reduced mobility

which affects their ability to perform daily tasks and to successfully reintegrate into community life.¹³ To improve outcome wherever possible, process of rehabilitation should be commenced before surgery. It should be noted that for a patient with amputation, the psychosocial issues that have to be faced often have more direct significance to the patient's life than the quality of the surgery or the nature of prosthetic device. After all only few of amputees in developing countries like ours can afford a prosthesis compared to developed world where majority can afford it.^{14,15} Post operative rehabilitation should begin as soon as medically feasible. With Paucity of local data with regards to early outcome of amputations, the study aims to determine early psychological outcome of major limb amputations, which can enhance our understanding of the optimal care that patients need. This will assist in effective planning of health care delivery towards improving patient wellbeing.

MATERIALS AND METHODS

This is a prospective descriptive study conducted on patients who had major limb amputation at National Orthopedic Hospital Dala within a one year period (August 2014-July 2015). The hospital is a 209 bed specialized tertiary health centre located in Dala Kano, the capital city of Kano state in North-Western Nigeria, which serves the Northern part of Nigeria, neighboring regions and countries such as Niger, Cameroon, and Chad. It has a dedicated accident and emergency operating theatre where emergency orthopedic cases are carried out on a daily basis apart from the main operating theatre of the hospital which has five suites. In addition, teaching and research in health-related matters are among the services undertaken in the hospital.

The study population comprise of all consented patients who were 18 years and above who had major limb amputation within the study period (August 2014-July 2015). We excluded Patients who have had amputation in other hospitals coming for refashioning, amputation in paraplegic patients or those with neurologic disorders such as Parkinson's disease, hemi paresis, myasthenia gravis, and

muscular dystrophy. Patients that are multiply injured or with multiple injuries in other parts of the body were also excluded e.g. chest, abdomen, head etc. likewise those who refused to give consent, Comatose patients and patients with more than a single limb amputation were all excluded. Using a population size from pilot study of 58, an absolute standard error of 0.05 and standard normal variance of 1.96, it was determined that a sample of 56 participants will be adequate, calculated using Yamane formula¹⁶. Taking attrition rate as 10% $n = N / (1 + N(e)^2)$ Where:

n = sample size

N = population size

e = degree of precision

Following approval by the hospital research ethical committee and permission from the Head of units to carry out the study, all consecutive patients admitted via either the accident and emergency unit or general outpatient clinic for major limb amputation that met the inclusion criteria were approached. The purpose, method, and role of each participant in the study were clearly explained and consent taken. They were then enrolled into the study until the desired sample size was reached.

A Socio-demographic questionnaire was used to obtain information about each patient in combination with indications for amputation and the clinic-pathological details such as operation date, type of amputation, level of amputation, mode of presentation, interval between presentation and surgery, and level of amputation.

Intensive counseling with psycho education was commence before amputation and continues after amputation by counselors. Physiotherapy, occupational therapy, coping skills and other life skill training commence after amputation to 3 months of follow up. The second set of data collected was on psychological outcome (i.e depression) and rehabilitation outcome. Rehabilitation outcome was graded using functional independence measure while depression was assessed with Mini International Neuropsychiatric Interview (MINI) Instrument.

Data Analysis

Data was analyzed using Statistical Package for Social

Sciences (SPSS) version 16.0 for windows. Data collected on the study questionnaire was entered using numeric codes. Frequency distribution tables of variables were generated and charts formed. Measure of central tendency and dispersion of quantitative variables as well as proportion for qualitative variables were determined.

RESULTS

Socio demographic characteristics

Out of the 54 participants that completed the study. Patients' age ranged from 18-82years. The age range for the female was 18-82years with a mean of 33yrs (sd=16.514) while the range and mean for the male was 19-62years and 28.36yrs (sd=16.615) respectively. 30 (55.6%) responding patients were between the ages of 18-30yrs. Majority were of the working age group (18-60yr) 51 (94.4%) while the elderly accounted for only 3 (5.3%). There were 42 (77.7%) males and 12 (22.3%) females. This gives a male: female ratio of 3.4:1.

In table 1: Eleven (20.4%) of the participants were not gainfully employed, 10 (18.5%) were students and the least affected were Civil servants in 7.4% of cases

Fig 1: shows the overall assessment of depression. Only 1 (1.9%) of the respondents was diagnosed with major depressive episode out of the 54 that completed the study. Among the remaining 53 (98.1%), some were found to have few symptoms of depression but not fulfilling the criteria for major depression. Although severity of symptoms vary among the patients.

Fig 2: shows the comparison between variables and depressive symptoms. It was noted when comparing the severity of depressive symptoms vis a vis cause of amputation, limb amputated, age and sex. Patients who had traumatic amputation (n=46) had amore depressive symptoms than those due to non trauma causes. Those that had upper limb amputations (n=15) experienced milder depressive symptoms than those who had lower limb amputation (n=39) Patients 60yrs and below (n=51) experienced more symptoms of depression than those greater than 60yrs (n=3). Male amputees (n=42) were noted to have few or no symptoms of depression than the female

amputees (n=12).

Fig 3: shows the comparison between variable values of rehabilitation. The rehabilitation of all the patients were good with a mean functional measure score of 117.59 (sd=3.328) and a P-value of 0.00 at discharge and even after follow up. Comparing the mean functional independent (FIM) measure score across individual groups, patients who had their amputation due to a trauma (n=46) had higher FIM mean score of 117.50 (sd=3.582) with a P-value of 0.00 Indicating better rehabilitation outcome than those due to non traumatic causes who had 115.50 (sd=3.025) Those that had upper limb amputations (n=15) had better rehabilitation with FIM score of 118.67 (sd=0.617) with a P-value of 0.00 than those with lower limb amputation (n=

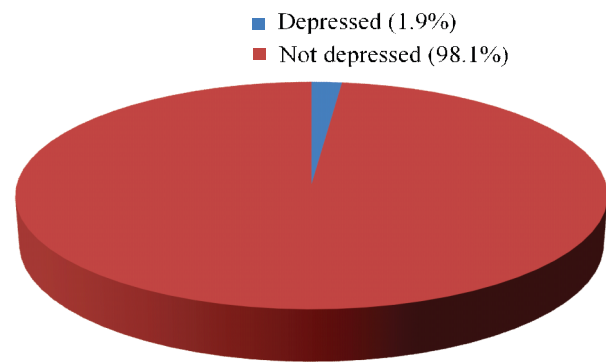


Fig 1: Assessment of depression

Table 1: Distribution by Patient's Occupation

	Frequency	Percent	Valid Percent	Cumulative Percent
Civil servant	4	7.4	7.4	7.4
Student	10	18.5	18.5	25.9
Driver	8	14.8	14.8	40.7
Farmer	6	11.1	11.1	51.4
Not gainfully employed	11	20.4	20.4	72.2
Artisan	8	14.8	14.8	87.0
Others	7	13.0	13.0	100.0
Total	54	100.0	100.0	

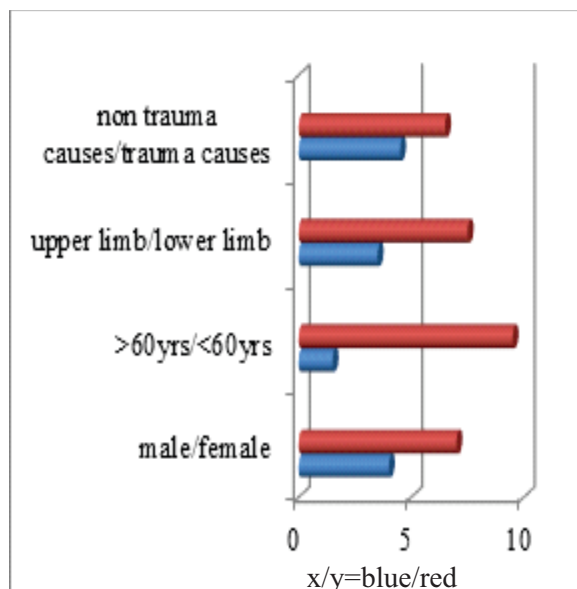


Fig 2: Comparison between variables and depressive symptoms

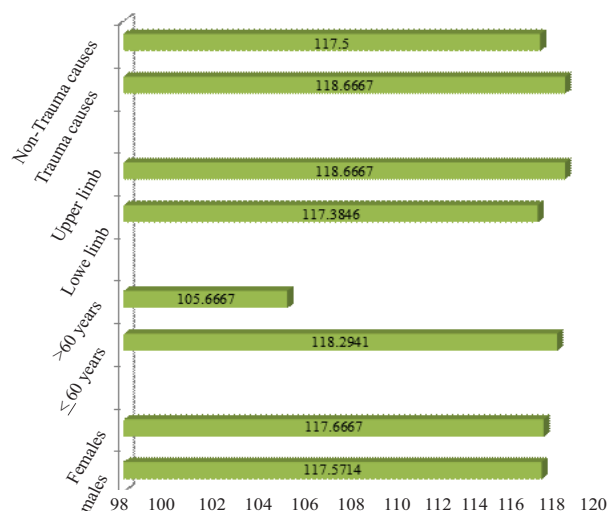


Fig 3: Comparison between mean values of functional independent measure

39) mean FIM score of 117.38 (sd=3.602) P-value 0.00. Patients who were 60yrs and below(n=51) recorded FIM scores of 118.29 (sd=1.171) with a P-value of 0.00 while the elderly older than 60 yrs(n=3) came up with mean FIM of 105.66 (sd=5.773) and a P-value of 0.00. Females (n=12) had better rehabilitation with FIM mean score of 117.67 (sd=2.839) with a P-value of 0.00 than men (n=42) whose mean was 117.57 (sd=3.486) and a P-value of 0.00.

DISCUSSION

We found that one (1.9%) out of the fifty four patients had major depressive episode while others have few symptoms of depression but did not fulfilled the diagnostic criteria for major depression according to MINI. This could be due to early intervention of rehabilitation process. According to Mckechnie *et al*, no good prospective data exists for levels of anxiety and depression beyond two years of follow up.⁵ However our findings differ to studies done by Igbal *et al*⁶ which revealed that 12 (24.5%) out of 196 patients had major depression. This could be due to the fact that early intervention in rehabilitation process was not carried out in their study compared to our study. It could also be due to their large sample size of 196 compared to 54 in our study. Even though depression is noted generally as low, interpretations as regard the severity of symptoms vary across groups.

Females were noted to have more of the symptoms of depression than men and as such seem to have more tendencies to be depressed. This could be due to hormonal changes in females. It aligns with findings by Manoj *et al*.⁸ Younger age group were noted to have more depressive symptoms than the elderly in this study, which also aligns with studies conducted by Mckechnie *et al*.⁵ This could be explained by the fact that the elderly most have seen it all. Most of them has had so many experiences of bad times, most have so many other debilitating illnesses that has been going on for a long time as such there limb being amputated may not mean any new thing to them. On the other hand the young are vibrant, just trying to make a meaning out of their life as such any form of limb loss may mean setting them years back.

Patients who had their limb amputated due to a non traumatic cause had few or no symptoms of depression than those due to trauma. This agrees with studies conducted by Manoj *et al*.⁸ This is probably due to the fact that a patient with a non traumatic cause may have been with some limitations over time and some might have been under a prolonged period of disease as such that removal of their diseased limb may be more of a relief than debility and some might have adjusted to using walking aids since childhood. The opposite is obtainable in those whose amputation is due to trauma. Most of the later are normal ambulant patients who, while going on with their activity of daily living suddenly incur an injury and the reality of living the rest of their lives with no limb or at best an artificial one becomes too much a shocker than could be in those whose amputation is from a disease. Patients with upper limb amputations had few or no symptoms of depression than those who had their lower limbs amputated. This could be due to the fact that upper limb amputation does not impair their walking ability like those of the lower limb.

Rehabilitation in all the patients was good using the functional independent measure. Mean score was 117.6(sd=3.328). This is in accordance with findings by Jane *et al*.¹⁷ Women were noted to be rehabilitated better than men (117.6:117.6).¹³ This aligns with findings of Cox *et al* and other papers and could be justified by the fact that women tend to attract the sympathy of their children and parents than men who are usually looked upon as able as such more attention is given to women from their relatives and sometimes the physiotherapist. Younger age group responds better to rehabilitation than the elderly (118.3:105.7).¹⁸ This is similar to findings by Amol *et al* in their paper "Association between Functional Severity and Amputation type with Rehabilitation Outcomes in Patients with Lower Limb Amputation". The Younger patients have this determination to return back to their pre-injury state and as such are more motivated than the elderly. Rehabilitation was found to be better in amputees who had trauma as the cause of their amputations than those from disease.¹⁸ Probable reason can stem from the fact that most patients who had limb amputations from disease may have other co-morbidities and as such may not be fit to get on with active

lifestyles. They are usually of the older age group and usually less motivated.¹⁸ Patients with upper limb amputations come up with better rehabilitation than those with lower limb amputations.

CONCLUSION

Early and proper rehabilitation of amputees seem to reduce their psychological symptoms. Tendency to get depressed following amputation is more common in the younger age group, female gender and in amputations as a result of trauma while rehabilitation seems better in same and vice versa.

Limitations

This is a single center hospital based study conducted within one year with a small sample size of 54 patients; its results may not reflect the true situation in the community. Secondly we did not collect data before intervention to compare with data after intervention to ascertain the effectiveness of rehabilitation in reducing psychological symptoms.

Conflicting interest

All authors have no competing interest regarding this work to declare.

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