

# Clinical Study of Meggit Wagner Grading of Diabetic Foot Lesions: Outcome and Management

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## Abstract

**Background and objective:** Foot ulceration will affect 15% of all individual with diabetes during their life time, with annual incidence of 3% in patients with diabetes, and is clearly a significant risk factor in the pathway of limb loss. Although multitude of factors is presumably implicated, foot lesion in diabetic can be attributed to triad of neuropathy, ischemia, and infection. It has been found that classification of diabetic foot not only enabled them to institute proper treatment regimen, but additionally, when such protocol are followed, the treatment outcome were significantly more successful than when protocols were not followed.

**Material And Methods:** Diabetic foot patient admitted to Mahatma Gandhi Memorial hospital, Warangal from period of November 2018 to December 2020 will be classified according to Meggit Wagner's classification and will be managed accordingly to the grade of the lesion.

**Results:** It was found that diabetic foot was more common in males with 84% of the patients were male and only 16% were females. In our study more common age group affected was 61-70 yrs. But majority of the affected patients were in age group 41-70yrs. It was found that around 55% had associated neuropathy and 34% patient had ischemia. Majority of the patient presented with Wagner's grade II lesion (45%), followed by grade III (30%), grade IV (12%) no patient was observed in grade 0. Of 100 patient studied only 6% patient could be managed conservatively and 94% of the patient require surgical intervention.

**Conclusion:** Meggit Wagner's classification helps in correlating appropriate treatment to proper grade of lesion with better outcome. Lesser grade lesion respond well to conservative treatment with antibiotics and debridement while those with higher lesion require some kind of amputation.

**Key words:** Diabetic foot lesions, Classification, Management

## INTRODUCTION

Diabetes is a common disease affecting about 2.4% in rural and 4%-11.6% in urban dwellers in India.<sup>[1]</sup> India has highest prevalence of diabetes in world and accounts for almost 1/6 of the diabetic patients. Approximately 10%-25% of all diabetics will develop some foot complications during the course of illness from simple calluses to major abscesses and osteomyelitis. Mean estimated total cost of management of diabetes in India was Rs 19,914 per individual per annum. This places inordinate social and

economic burden on the health care system and also the families of the patient. Several classifications exists for grading ulceration and their management, however Wagner's classification is the simplest, best known for evaluation and management of diabetic footulceration.<sup>[2]</sup>

## WAGNERS CLASSIFICATION AS ADOPTED BY LEVIN O NEALS3

GRADE 0- high risk foot no ulceration. GRADE 1- superficial ulcer.

GRADE 2- deep ulcer.

GRADE 3- osteomyelitis with ulceration or abscess

GRADE 4- partial foot gangrene.

GRADE 5- gangrene of entire foot.

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**Month of Submission :** 06-2021  
**Month of Peer Review :** 07-2021  
**Month of Acceptance :** 07-2021  
**Month of Publishing :** 08-2021

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## STANDARD TREATMENT ACCORDING TO WAGNERS CLASSIFICATION<sup>233</sup>

GRADE 0- prevention

GRADE 1- antibiotic, good glycemetic control

GRADE 2- surgical intervention

GRADE 3- some sort of amputation

GRADE 4- debridement and amputation

GRADE 5- below knee amputation.

Relative Risk of leg amputation is 40 times higher among person with diabetes than with those not diabetic. Moreover up to 50% of diabetic amputees will undergo a second leg amputation within 5 years of initial amputation. The management of diabetic foot is focused primarily on avoiding amputation of lower extremities. Hence early recognition and proper therapy of diabetic foot lesion may save diabetic foot and leg.<sup>[2]</sup>

The amount of interest in the diabetic foot has increased tremendously over the past five year. There continues to be great interest in the treatment and prevention of diabetes foot.

### Aims and Objectives of the Study

1. To Re evaluate role of Wagner's classification in the study and management of diabetic foot in patient admitted to Mahatma Gandhi memorial Hospital, Warangal.
2. To investigate the surgical strategy of diabetic foot and analyze the therapeutic efficacy.
3. To study and compare outcomes and also to identify measures to decrease the morbidity and mortality due to diabetic foot.

## MATERIAL AND METHODS

### Source of Data

Diabetic foot patients secondary to type 2 DM and type 1 DM and admitted to Mahatma Gandhi Memorial Hospital, Warangal between the periods of November 2018 to December 2020.

### Method of Collection of Data

Data will be collected in a pretested proforma meeting the objectives of this study. The data for the purpose of the study includes various socioeconomic parameters like age, sex, occupation, habits, etc. 100 Cases will be selected and followed for 6 months duration.

## OBSERVATION AND RESULTS

The results of clinical study of 100 cases of diabetic foot studied at Mahatma Gandhi Memorial Hospital, Warangal.

1. Age distribution of 100 cases studied in MGM hospital youngest patient was 15 yrs old and eldest patient was 90 yrs old. Highest numbers of cases were found in the age group of 61-70 yrs.
2. Sex- of the total 100 cases studied, there were 84 males and 16 females.
3. H/o Neuropathy –of the 100 cases studied 55 patients were found to have peripheral neuropathy.
4. H/O Ischemia-out of 100 cases studied 34 patient had signs of ischemia
5. Presentation according to Wagner's classification- maximum patient present with grade II Wagner's lesion.
6. Treatment [Tables 1-6].

## STATISTICAL METHODS APPLIED

### Frequencies

The Frequencies procedure provides statistics and graphical displays that are useful for describing many types of variables. For a first look at your data, the Frequencies procedure is a good place to start.

### Chi-square Test

The Chi-Square Test procedure tabulates a variable into categories and computes a chi-square statistic. This

**Table 1: Age Distribution**

Age (yrs)	No. of patients	Percentage
0-10	-	-
11-20	1	1%
21-30	1	1%
31-40	9	9%
41-50	24	24%
51-60	25	25%
61-70	27	27%
71-80	12	12%
81-90	1	1%
	100	100%

**Table 2: Sex Distribution**

	No. of cases	Percentage
Males	84	84%
Females	16	16%

**Table 3: Distribution of Neuropathy**

	Neuropathy Present	Neuropathy absent	Total
Total no of cases	55	45	100
Percentages	55%	45%	100%

Chi-square=1.0 ; P=.317

goodness-of-fit test compares the observed and expected frequencies in each category to test either that all categories contain the same proportion of values or that each category contains a user-specified proportion of values.

## DISCUSSION

1. Age- Age distribution of 100 cases studied in MGM Hospital, Warangal youngest patient was 15 yrs old and eldest patient was 90 yrs old. Highest number of cases were found in the age group of 61-70 yrs. As compared to study conducted by “Rooh-ul mukim” majority of

**Table 4: Distribution of ischemia**

	Ischemia present	Ischemia absent	Total
Total no. of cases	34	66	100
Percentage	34%	66%	100%

Chi-square=10.24 ; P=.000

**Table 5: Distribution according to Wagner’s classification**

Wagner’s grade	No of patient	Percentage
Grade 0	-	-
Grade I	9	9%
Grade II	45	45%
Grade III	30	30%
Grade IV	12	12%
Grade V	4	4%
TOTAL	100	100%

Chi-square=58.30 ; P=.000

**Table 6: Treatment modalities**

	No. of cases	Percentages
Conservative	6	6.0
Debridement	33	33.0
Split skin graft	11	11.0
Disarticulation	21	21.0
Fasciotomy	10	10.0
I and D	10	10.0
Below knee amputation	2	2.0
Above knee amputation	2	2.0
Debridement+ SSG	3	3.0
Fasciotomy +SSG	1	2.0
Debridement + Fasciotomy	1	6.0

Chi-square=90.80 ; P=.000

Cons-6; Sur-94;

**Table 7: Discussion Content in Tabular form 1**

	<40 years	41-50years	51-60years	>60 years	Total
Present study	11%	24%	25%	40%	100%
Rooh- ul- Mukim, Mukhtar ahmed, Samson Griffin	9%	47%	32%	12%	100%

our cases were in above 60years of age whereas in their study majority of cases were in 41-50 years of age group.

2. Type of diabetic mellitus-As compared to study conducted by “Rooh-ul- mukim” data’s are almost comparable and diabetic foot complications is more commoner in type II DM patient as compared to type I DM.
3. Sex-of the 100 cases studied 84 cases were males and 16 cases were females. Male to female ratio was 6.14. As compared to study by “Rooh-ul-mukim” there are more male patients and less female patients observed in our study. Higher incidence of diabetic foot in males may be due to the exposure to injuries during their work, which subsequently leads to injury mostly to the insensitive foot.
4. Neuropathic lesion-diabetic peripheral neuropathy is the most important factor contributing the frequency and severity of the lesion. in the present study 55% of the patients were found to have peripheral neuropathy. These patient had h/o pain in the extremities, of burning and pricking in nature. Examination revealed reduced or absent cutaneous sensation and vibratory sensation. Kumar *et al.*(234)in 1994 reported high prevalence of peripheral neuropathy of (41.6%) in a population based study.
5. Ischemic lesion-In the present study 31% of the patients were found to have ischemic lesions.
6. Nature of the lesion-of the 100 cases studied full thickness ulcer 45% was the most common presentation followed by cellulitis 17%,abscess was 15%, gangrene was seen in 13% of the patients.

**Table 8: Discussion Content in Tabular form 2**

	Type I DM	Type 2 DM	TOTAL
Present study	1	99	100
Rooh- ul-Mukim, Mukhtar ahmed, Samson Griffin	2	98	100

**Table 9: Discussion Content in Tabular form 3**

	Male	Female	Total
Present study	84%	16%	100%
Rooh- ul-Mukim, Mukhtar ahmed, Samson Griffin	62%	38%	100%

**Table 10: Discussion Content in Tabular form 4**

	Peripheral neuropathy
Present study	55%
Kumar <i>et al.</i>	41.6%

**Table 11: Discussion Content in Tabular form 5**

	Grade 0	Grade I	Grade II	Grade III	Grade IV	Grade V	Total
Present study	0	9%	45%	30%	12%	4%	100%
Rooh- ul- Mukim, Mukhtar ahmed,Samson Griffin	6%	14%	25%	30%	21%	4%	100%

**Table 12: Discussion Content in Tabular form 6**

	Present study	Rooh- ul-Mukim, Mukhtar ahmed,Samson Griffin
Conservative	6%	17%
Debridement	33%	28%
SSG	11%	2%
Amputation + disarticulation	25%	48%
I and D	10%	5%
Fasciotomy	10%	-
Multiple procedure	5%	-
Total	100%	100%

Osteomyelitis was seen in 1% of the patients. Only 4% of the patients had lesion which required any kind of amputation

- Lesion according to Wagner's classification-Majority of the patients were in grade II lie 45% of the patients. No patients were observed in grade 0 lesion. In grade III 30%, grade IV 12% were observed. 4% of the pt were in grade V who underwent major amputation. Study conducted by "Rooh-ul-mukim" majority of the cases were in Grade II and III similar to present study where majority of the cases are in Grade II and Grade III.
- Mode of treatment-only 6% of the individual improved with conservative management and majority patients 94% were subjected to surgical intervention. Of the surgical intervention 38 patient underwent debridement, 21 patient underwent disarticulation for gangrene of toes. 15 patient underwent SSG for covering the healing ulcer. 10 patient were treated with I and D and 4 patients underwent major amputation. Compared to "Rooh-ul-mukim" only 25% of our patient underwent disarticulation or amputation compared to 48% in their study. Only 6% of our patient improved with conservative management indicating that surgery is the main line of management in patient with diabetic foot [Tables 6-12].

## CONCLUSION

- Foot ulceration in diabetic patients is resource consuming, disabling morbidity, that often is the first

step towards lower extremity amputation. Prevention is the best treatment.

- Wagner's classification helps in correlating appropriate treatment to proper grade of lesion with better outcome. Lesser grade lesion respond well to conservative treatment with antibiotics and debridement while those with higher lesion require some kind of amputation.
- Effective glycemic control and education are of key importance for decreasing diabetic foot disease.
- With early presentation and hospital admission, aggressive medical and surgical treatment according to the grade of the disease can improve outcome and reduce the morbidity and mortality due to diabetes.

## SUMMARY

Diabetic patients have always suffered from complication affecting the lower limbs. Foot infection and subsequent amputation of lower extremities are the most common cause of hospitalization among diabetic foot patients.

Preventing strategy including patient's education in foot care, prophylactic skin and nail care, and footwear reduces the risk of foot ulceration and lower limb amputation by 25%. Prescription footwear accommodating deformity and decreasing pressure and shear force applied to skin overlying the bone prominence, keep individuals ambulatory and protect them from ulcer formation.

A nurse provided foot specific diabetic screening and education combined with protective foot wear, is a cost and resource effective method of decreasing rate of diabetic foot ulcers, and the risk of eventual lower extremity amputation.

Grading diabetic foot lesion according to the Wagner's classification helps in correlating appropriate treatment to proper grade of lesion with better outcome.

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**How to cite this article:** Geetha M. Clinical Study of Meggit Wagner Grading of Diabetic Foot Lesions: Outcome and Management. *Int J Sci Stud* 2021;9(5):174-178.

**Source of Support:** Nil, **Conflicts of Interest:** None declared.