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A Study on the Risk Factors for the Development of Diabetic Foot Among Patients with Type 2 Diabetes Mellitus

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ABSTRACT

Background: The threat of diabetic foot ulcer casts an ominous shadow over the lives of diabetic patients leading to amputations. Management of the diabetic foot requires a thorough knowledge for the major risk factors, meticulous prevention and maintenance. Objective : To find out risk factors which are significant in the development of diabetic foot among diabetics Material and methods. Study design: Case-Control study. Cases: Diabetic patients aged above 40 years having foot ulcers. Control: Diabetic patients aged above 40 who are not having foot ulcers. Study Setting: Patients attending OP & IP in SUT Academy Of Medical Sciences. Study Population:150 diabetic patients. Study Period: September to December 2013.Method of study: Data collected by questionnaire. Study variables were age, education, early age at onset of diabetes, duration of diabetes mellitus, control of blood sugar, neuropathy, peripheral vascular disease, poor foot care. Procedure: Interview using close ended questionnaire and then examined clinically. Data analysis using chi square and odds ratio Results: For uncontrolled blood sugar, early age at onset of diabetes, neuropathy, peripheral vascular diseases and poor foot care, odds ratio was 3.87; 5.15; 17.4; 5.5; and 15.4 respectively. Conclusion. Risk factors such as uncontrolled blood sugar, early age at onset of diabetes, neuropathy, peripheral vascular diseases, and poor foot care are significantly associated with diabetic foot.

KEYWORDS : – Type 2 Diabetes Mellitus, Complication, Chi square test, Diabetic foot

Introduction:

Diabetes mellitus is increasingly being recognized as a major problem in our society.[1]Many people with diabetes develop lower limb complications that seriously affect their quality of [2].Current cost of diabetes is that it has increased lower limb amputations by 25 fold and 10-30% reduction in life expectancy[3]. Patients with diabetic foot ulcers increases in number annually[4].Many cases show high morbidity which may even lead to septicemia. [5]Management of the diabetic foot requires a thorough knowledge for the major risk factors.[6] Previous studies have showed that high foot pressure is related to diabetic neuropathic ulceration[7].

Objective :

To find out risk factors which are significant in the development of diabetic foot among diabetics

Material and methods. Study design:

Case-Control study.**Cases:** Diabetic patients aged above 40 having foot ulcers. **Control:** Diabetic patients aged above 40 who are not having foot ulcers. **Study Setting:** Patients attending OP & IP in SUT Academy Of Medical Sciences. **Study Population:**150 diabetic patients. **Study Period:** September to December 2013. **Method of study:** Data collected by questionnaire. **Study variables:**1.Age, 2.Education & socio-economic status, 3.Early age at onset of diabetes, 4.Duration of diabetes mellitus, 5.Control of blood sugar, 6.Neuropathy, 7.Peripheral vascular disease, 8.Poor foot care, 9.Trauma **Procedure:** Out of 150 diabetics who were attending OP and admitted as IP for various reasons ranging from poor control of diabetes/ with ulcers to septicemia, 59 patients were having diabetic foot ulcer and took as cases. Age matched controls were taken from 91 patients without diabetic foot ulcer. Each of the patients was interviewed using close ended questionnaire and then examined clinically.

Statistical analysis Statistical analysis was done using chi square test and odds ratio. The analysis was performed using SPSS software.

Results and discussion

Table 1. Relationship between diabetic foot ulcer and blood sugar level

Feature	Patients with diabetic foot ulcer	Patients without diabetic foot ulcer
Uncontrolled blood sugar	38 (64%)	29 (32%)
Controlled blood sugar	21 (36%)	62 (66%)

χ^2 =28 odds ratio=3.87

Discussion : There is significant association between diabetic foot and uncontrolled blood sugar. Those having diabetic foot have 3.87 times odds of having uncontrolled blood sugar than that of diabetics without foot ulcer.

Table 2. Relationship between diabetic foot ulcer and early age of onset of diabetes

Features	Patients with diabetic foot ulcer	Patients without diabetic foot ulcer
Early age (Before 40 years)	44	33
Late age	15	58

χ^2 =19:13 Odds ratio = 5.15

Discussion:

There is a significant association between diabetic foot and early age of onset of diabetes. Those with diabetic foot have 5.15 times odds of developing diabetes in early age than those without diabetes.

Table 3. Relationship between diabetic foot and neuropathy

Feature	Patients with diabetic foot ulcer	Patients without diabetic foot ulcer
Neuropathy Present	O=49	O=20
Neuropathy absent	O=10	O=71

O=Observed value χ^2 =63 Odds ratio=17.4

Discussion:

There is significant association between diabetic foot and neuropathy. Those with diabetic foot have 17.4 times odds of having neuropathy than that of diabetics without diabetic foot By taking the previous studies into the account ,the seattle diabetic foot study 1999 and the trafermin in neuropathic diabetic foot ulcer study strongly support for the association between diabetic foot and neuropathy

Table 4. Relationship between diabetic foot and peripheral vascular diseases

Feature	Patients with diabetic foot ulcer	Patients without diabetic foot ulcer
With peripheral vascular diseases	0=36	0=20
Without peripheral vascular diseases	0=23	0=71

O=Observed value χ^2 =17 Odds ratio=5.55

Discussion:
There is significant association between diabetic foot and peripheral vascular disease. Those with diabetic foot have 5.55 times odds of having peripheral vascular disease than that of diabetics who don't have diabetic foot.

Table 5. Relationship between poor foot care and diabetic foot

Feature	Patients with diabetic foot ulcer	Patients without diabetic foot ulcer
Poor foot care	0=46	0=17
Good foot care	0=13	0=74

O=Observed value χ^2 =52.6 Odds ratio=15.4

Discussion: There is significant association between diabetic foot and poor foot care. Those with diabetic foot have 15.4 times odds of having poor foot care than diabetics without diabetic foot

Conclusion:
There is significant association between diabetic ulcer & following risk factors: 1.Uncontrolled blood sugar 2.Early age of onset of diabetes 3.Neuropathy 4.Peripheral vascular disease 5.Poor foot care. It can be concluded that diabetic foot ulcer is multifactorial in origin and by early identification and control of risk factors, development of diabetic foot can be prevented.

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