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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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DETERMINANTS OF DIABETIC FOOT AMONG PATIENTS WITH TYPE 2 DIABETES: A CASE-CONTROL STUDY

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Abstract.

Background: Diabetic foot is one of the most serious complications of type 2 diabetes mellitus, often leading to ulcers, infections, and amputations.

Aim of the Study: To assess the risk factors of diabetic foot among patients with type 2 diabetes.

Methods: A case–control study including 200 type 2 diabetic patients was conducted. Patients were selected by a convenience sampling technique. The sample consisted of 100 patients with diabetic foot (cases) and 100 patients without diabetic foot (controls). Multiple logistic regression analysis was used.

Results: Older age was prominent with most aged ≥ 60 years and the male-to-female ratio was 3:2. Multivariable logistic regression identified HbA1c ≥ 7% (OR = 59.47, p < 0.001), diabetic duration ≥ 15 years (OR = 59.66 ,p < 0.001), neuropathy (OR = 7.82, p = 0.008), hypertension (OR = 8.99, p = 0.003), unemployment (OR = 14.33, p = 0.032), foot deformities (OR = 22.32, p = 0.014), history of corns and calluses (OR = 51.67, p = 0.001), lack of foot care awareness (OR = 4.51, p = 0.031), and not using emollients (OR = 21.36, p = 0.002) as independent predictors of diabetic foot.

Conclusion: Diabetic foot is strongly linked to multiple modifiable risk factors. Early identification and proper management are essential to reduce complications and improve outcomes.

Key words. Diabetic foot, foot care, peripheral neuropathy, risk factor.

Introduction.

Diabetes mellitus is a metabolic disease caused by either inadequate insulin secretion, defective insulin function, or both. The clinical manifestation of diabetes mellitus depends on the duration and type of it [1]. Nowadays, diabetes is considered as a global pandemic disease with long-term complications. One of the most serious and prevalent complications of diabetes mellitus is the diabetic foot, in addition to other major complications such as nephropathy, retinopathy and neuropathy [2]. The International Working Group on the Diabetic Foot and the World Health Organization (WHO) define diabetic foot as the foot of diabetic patients who have neurological abnormalities, varying degrees of peripheral vascular disease in the lower limb, and deep tissue ulceration, infection, and/or destruction [3]. A diabetic foot ulcer is developing typically on the bottom, and this ulcer is caused by a combination of causes, including peripheral neuropathy, peripheral artery disease and possibly foot trauma. They can range in severity from superficial wounds to severe ulcers affecting tendons, bones, and even causing gangrene [4]. Diabetic foot is a leading cause of hospitalization for patients with diabetes. Furthermore, diabetes foot care creates a significant burden on patients, their households, healthcare institutions, and society in its entirety [5]. Advanced age, longer duration of diabetes (>10 years), structural foot deformities, prior ulcer history, related systemic disorders (e.g., peripheral neuropathy, peripheral vascular disease, and nephropathy/retinopathy), poor glycemic control, low socioeconomic status, smoking, and other risk factors can all raise the likelihood of diabetic foot complication [6]. Patients with diabetic foot require a multidisciplinary team approach, which can reduce the risk of amputation by up to 85% [7]. Early diagnosis and treatment may be the most practical way to improve the prognosis of diabetic foot ulcer [8].

Materials and Methods.

Study Setting and Design:

Ethical approval was obtained prior to data collection in April 2025. This case–control study was conducted in Mosul, Iraq. The study was conducted from May to December 2025. Patient recruitment and data collection were carried out over a four-month period from May to August 2025. The remaining period until December 2025 was dedicated to data analysis and manuscript preparation. The study included patients with type 2 diabetes mellitus from major hospitals in both sides of the city.

Study Sample:

The present study included 200 patients with type 2 diabetes mellitus selected by a convenience sampling technique, aged ≥40 years. Cases (n=100) were patients with type 2 diabetes mellitus diagnosed with diabetic foot (ulcer, infection, or gangrene), and controls (n=100) were patients type 2 diabetes mellitus without any history or evidence of diabetic foot. Both cases and controls were recruited from the same hospitals. Inclusion criteria for cases: type 2 diabetes mellitus patients aged ≥40 years of both sexes with diabetic foot. Inclusion criteria for controls: type 2 diabetes mellitus patients aged ≥40 years of both sexes without any history or evidence of diabetic foot. Exclusion criteria (for both groups): type 1 diabetes, age <40, gestational diabetes, foot ulcers due to other causes (e.g., varicose veins, bed sores), previous fractures complicated by osteomyelitis, and patients who refused participation.

Data Collection:

Data were collected using a structured questionnaire covering demographic characteristics, duration of diabetes, comorbidities, Glycated Hemoglobin (HbA1c) level, lifestyle factors (smoking, diet, treatment adherence, Body mass index (BMI), physical activity), foot care practices, deformities, treatment type, and access to healthcare. Peripheral neuropathy was defined as the patient had a history of foot numbness, loss of pain sensation, or altered delicate touch and proprioception. Peripheral artery

disease was defined as the presence of ischemic manifestations such as intermittent claudication, absent pedal pulse, arterial occlusion, or reduced blood flow to the foot as detected by Doppler examination. A documented history of comorbidities was all considered positive based on the physician's diagnosis. BMI which is patient's weight in kilogram divided by height square in meter. The world health organization (WHO) classified persons according to their body mass index into: underweight (below 18.5 kg/m²), normal weight (18.5 to 24.9 kg/m²), overweight (25.0 to 29.9 kg/m²), and obese (30 kg/m² or higher). Regarding physical activity, regular activity referred to exercise performed more than 30 min/day for 5 days/week.

Statistical Analysis:

Data was entered into Microsoft Access and analyzed using SPSS v27 and Minitab v19. Descriptive statistics were presented as means, frequencies, and percentages. Associations were assessed using odds ratios with 95% confidence intervals. Chi-square and Fisher's exact tests were applied. Multivariate logistic regression was performed to adjust for potential confounders. Statistical significance was set at $p < 0.05$.

Results.

Table 1 shows the majority of patients with diabetic foot are aged ≥ 60 years. Concerning sex, higher proportion of patients with diabetic foot was found in male patients compared to females 3:2 and the difference was statistically significant. Unemployment shows a statistically significant association with diabetic foot. Table 2 shows that smoking and no exercise are also significantly associated with diabetic foot. The mean HbA1c of patients with diabetic foot was 8.09 ± 2.01, compared with for control group 6.310 ± 1.2420 for control group. The mean BMI of patients with diabetic foot was 27.25 ± 3.41, compared with 25.22 ± 3.13 for control group.

Table 3 shows the frequency of ischemic heart disease was significantly higher among patients with diabetic foot. Also, cerebral vascular disease showed a statistically significant association with diabetic foot. Dyslipidemia, peripheral artery disease, nephropathy, and retinopathy showed a statistically significant association with diabetic foot. Table 4 shows non-using special footwear was statistically significant among diabetic foot patients. Irregular or absent foot inspection was also linked to diabetic foot; patients inspecting their feet only occasionally had higher odds of diabetic foot. Poor foot hygiene showed a statistically significant association. Table 5 shows the final multivariate logistic regression model after adjusting for potential confounders. Unemployed participants had a much higher risk of diabetic foot. Longer duration of diabetes was a strong predictor particularly ≥ 15 years and similarly, hypertension, neuropathy and poor glycemic control (HbA1c ≥ 7%) remained strong and independent risk factors. Other significant predictors included foot deformities, lack of awareness about foot care, history of corn and calluses and not using any emollient. Regarding model fit, the results of the Hosmer–Lemeshow test was not statistically significant (χ^2 = 9.450, df = 8, p = 0.306), indicating an acceptable goodness-of-fit of the logistic regression model.

Discussion.

The present study demonstrated that the patients with diabetic foot were significantly older than controls, with most cases aged ≥ 60 years. This finding is consistent with studies from Iraq by Mahmood et al. [9] and Saudi Arabia by Al-Rubeaan et al. [10]. Male sex was significant associated with diabetic foot, in agreement with studies in Iraq by Saleh HK et al. [11] and Saudi Arabia by Abolfotouh et al. [12]. Marital status and educational level were not significantly associated with diabetic foot, consistent with a study in Iraq by Mohammed [13]. Unemployment demonstrated a significant association with diabetic foot as confirmed by logistic regression results, consistent with a study in Ethiopia by Woldemariam et al. [14].

Table 1. *Association between socio-demographic factors and diabetic foot among type 2 diabetic patients.*

Variables		Patients With diabetic foot (n=100)		Control group (n=100)		OR	95% C.I (OR)	P value*
		No	%	No	%			
Age (years)	40-50***	15	15.0	28	28.0			.004
	50-60	29	29.0	37	37.0	1.46	0.66-3.24	.346
	≥ 60	56	56.0	35	35.0	2.99	1.40-6.36	.004
	Mean ± SD	60.32(10.55)		55.81(9.37)		-----		.002
Sex	Male	60	60.0	36	36.0	2.67	1.51-4.72	.001
	Female	40	40.0	64	64.0			
Marital Status	Single	3	3.0	4	4.0	0.74	0.16-3.41	.999**
	Married	97	97.0	96	96.0			
Education	Illiterate ***	45	45.0	43	43.0	---	-----	.776
	Primary	29	29.0	38	38.0	0.73	0.39-1.38	.332
	Secondary	8	8.0	7	7.0	1.09	0.37-3.27	.875
	University +	18	18.0	12	12.0	1.43	0.62-3.33	.401
Occupation	Unemployed	18	18.0	7	7.0	2.92	1.16-7.33	.019
	Employed	73	73.0	80	80.0	0.68	0.35-1.31	.243
	Retired	9	9.0	13	13.0	0.66	0.27-1.63	.366
Residence	Urban	61	61.0	78	78.0	0.44	0.24-0.82	.009
	Rural	39	39.0	22	22.0			

** Chi square test ** Fisher exact test *** Reference group*

Table 2. *General risk factors associated with diabetic foot among type 2 diabetic patients.*

Variables		Patients With diabetic foot (n=100)		Control group (n=100)		OR	95% C.I (OR)	P value*
		No	%	No	%			
Smoking	**Smoker**	35	35.0	19	19.0	2.30	1.20-4.39	.011
	Nonsmoker	65	65.0	81	81.0			
HbA1c	**≥ 7**	71	71.0	21	21.0	9.21	4.82-17.59	<.001
	< 7	29	29.0	79	79.0			
No Exercise	**Yes**	97	97.0	84	84.0	6.16	1.73-21.87	.002
	No	3	3.0	16	16.0			
BMI	**Normal*** **	26	26.0	65	65.0	---	-----	<.001
	Overweight	55	55.0	24	24.0	5.73	2.96-11.09	<.001
	Obese	19	19.0	11	11.0	4.32	1.81-10.32	.001
Non-Adherence to Healthy Diabetic Diet	**Yes**	93	93.0	76	76.0	4.20	1.72-10.27	.001
	No	7	7.0	24	24.0			
Irregular Daily Monitoring of Blood Sugar	**Yes**	64	64.0	26	26.0	5.06	2.76-9.27	<.001
	No	36	36.0	74	74.0			
Non-Adherence to Treatment	**Yes**	34	34.0	3	3.0	16.66	4.91-56.49	<.001
	No	66	66.0	97	97.0			
Absence of Nearby Facility Care	**Yes**	32	32.0	3	3.0	15.22	4.48-51.71	<.001
	No	68	68.0	97	97.0			
Irregular Physician Visits for Evaluation and Treatment of Diabetes	**Yes**	55	55.0	38	38.0	1.99	1.13-3.51	.016
	No	45	45.0	62	62.0			
Duration of DM (year)	**< 5*** **	8	8.0	39	39.0			<.001
	5-10	29	29.0	38	38.0	3.72	1.51-9.16	.003
	10-15	22	22.0	14	14.0	7.66	2.78-21.11	<.001
	> 15	41	41.0	9	9.0	22.1	7.78-63.36	<.001
Type of Management	**Oral Hypoglycemic Therapy**	58	58.0	87	87.0	0.21	0.10-0.42	<.001
	Insulin	18	18.0	7	7.0	2.92	1.16-7.33	.019
	Both	24	24.0	6	6.0	4.95	1.92-12.72	<.001

** Chi square test ***Reference group*

Table 3. *Medical risk factors that contribute to the development of diabetic foot.*

Variables		Patients With diabetic foot (n=100)		Control group (n=100)		OR	95% C.I (OR)	P value*
		No	%	No	%			
Hypertension	**Yes**	75	75.0	29	29.0	7.35	3.93-13.73	<.001
	No	25	25.0	71	71.0			
Ischemic Heart Disease	**Yes**	39	39.0	11	11.0	5.17	2.46--10.89	<.001
	No	61	61.0	89	89.0			
Cerebral Vascular Disease	**Yes**	10	10.0	3	3.0	3.59	1.00-13.47	.045
	No	90	90.0	97	97.0			
Dyslipidemia	**Yes**	38	38.0	15	15.0	3.47	1.76-6.87	<.001
	No	62	62.0	85	85.0			
Peripheral Artery Disease	**Yes**	39	39.0	4	4.0	15.34	5.22-45.09	<.001
	No	61	61.0	96	96.0			
Nephropathy	**Yes**	25	25.0	10	10.0	3.00	1.36-6.64	.005
	No	75	75.0	90	90.0			
Retinopathy	**Yes**	42	42.0	13	13.0	4.85	2.39-9.81	<.001
	No	58	58.0	87	87.0			
Neuropathy	**Yes**	94	94.0	59	59.0	10.89	4.35-27.22	<.001
	No	6	6.0	41	41.0			

** Chi square test.*

Table 4. *Comparison of foot care and conditions among study groups.*

Variables		Patients With diabetic foot (n=100)		Control group (n=100)		OR	95% C.I (OR)	P value*
		No	%	No	%			
History of Corns and Calluses	**Yes**	31	31.0	5	5.0	8.54	3.16-23.07	<.001
	No	69	69.0	95	95.0			
Not Using Special Footwear	**Yes**	97	97.0	90	90.0	3.59	1.00-13.47	.045
	No	3	3.0	10	10.0			
Lack of Awareness of Foot Care Practices	**Yes**	55	55.0	27	27.0	3.31	1.83-5.97	<.001
	No	45	45.0	73	73.0			
Foot Inspection	**Daily**	31	31.0	68	68.0	0.21	0.12-0.38	<.001
	Occasionally	58	58.0	27	27.0	3.73	2.06-6.76	<.001
	Never	11	11.0	5	5.0	2.35	0.78-7.03	.118
Poor Foot Hygiene	**Yes**	53	53.0	22	22.0	4.00	2.16-7.39	<.001
	No	47	47.0	78	78.0			
Not Using any Emollient for the Feet	**Yes**	90	90.0	72	72.0	3.50	1.60-7.68	.001
	No	10	10.0	28	28.0			
Foot Deformities	**Yes**	13	13.0	2	2.0	7.32	1.61-33.35	.003
	No	87	87.0	98	98.0			

* *Chi square test*

Table 5. *Multivariable Logistic Regression.*

Multivariable Logistic Regression	B	S.E.	Sig.	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
Occupation			.068			
Occupation Employed	1.661	0.838	.047	5.265	1.019	27.194
Occupation Unemployed	2.662	1.239	.032	14.330	1.264	62.499
Duration of Diabetes			.002			
Duration of Diabetes ≥ 15	4.089	1.089	.000	59.657	7.056	104.367
Duration of Diabetes 11-15	1.820	0.778	.019	6.173	1.343	28.368
Hypertension	2.197	0.739	.003	8.999	2.114	38.309
Neuropathy	2.057	0.773	.008	7.819	1.720	35.546
HbA1c ≥ 7	4.085	0.858	.000	59.465	11.073	319.326
Foot Deformities	3.105	1.265	.014	22.315	1.870	166.216
lack of Awareness of Foot Care Practices	1.505	0.700	.031	4.505	1.143	17.751
History of Corn and Calluses	3.945	1.148	.001	51.672	5.444	290.420
Not Using any Emollient	3.061	.969	.002	21.355	3.195	142.726
Constant	16.303	2.865	.000	0.000		

Hosmer and Lem eshow Test			
Step	Chi-square	df	Sig.
1	9.450	8	0.306

Urban residence was found to be protective, and the difference was statistically significant, similar to a study in Egypt by Salama et al. [15].

Smoking showed a statistically significant association with diabetic foot, which is consistent with study [10]. In contrast a study in Iran by Yazdanpanah [16] et al. found no statistically significant association with diabetic foot. This inconsistency between studies may be due to differences in population characteristics. No exercise and high BMI were statistically significant associations with diabetic foot, in agreement with findings in studies [17] and [18] respectively. Non-adherence to a healthy diabetic diet and non-adherence to prescribed treatment were associated with diabetic foot in this study, in alignment with studies [19] and [20] respectively. Less frequent glucose monitoring was associated with higher risk of diabetic foot, consistent with study [13]. HbA1c levels among cases were significantly associated with diabetic foot, as confirmed by logistic regression consistent with results of a study conducted in Iran by Danesh et al. [21]. Limited access to healthcare facilities was also significantly associated with diabetic foot, emphasizing the role of healthcare accessibility and continuity of care in preventing foot complication. These results agree with study done in India by singh et al. [22], which found that limited access to health-care services significantly influence diabetic foot management and prognosis. Irregular physician visits were significantly associated with diabetic foot, which is inconsistent with study [13]. This discrepancy may be explained by differences in study population, healthcare accessibility, and sample size.

Regarding duration of diabetes in present study, the risk of diabetic foot increased progressively with longer diabetes duration, reflecting a clear dose–response relationship, as

also revealed by logistic regression. These results are in agreement with a study in Yemen by Bin Hameed and Baras [23]. Regarding type of treatment, the odds ratio of combined insulin and oral therapy is nearly fivefold higher in diabetic foot patients compared with the control group. Similar results were revealed in a study done in Maldives by Ahmed I et al. [24], which found that the odds of combined insulin and oral therapy were fourfold higher in diabetic foot patients compared to controls. In contrast, a study in Ethiopia by Woldemariam et al. [14] found that patients with diabetes taking insulin and oral therapy were less likely to develop diabetic foot compared with controls. The plausible reason for this discrepancy could be due to differences in condition of diabetes mellitus among the study participants.

Among medical risk factors, ischemic heart disease and peripheral arterial disease were significantly associated with diabetic foot. These conditions contribute to impaired blood flow and tissue ischemia, limiting oxygen delivery, and delaying wound healing. These results are similar to a study conducted in Saudi Arabia by Abolfotouh et al. [12]. Hypertension was significantly associated with diabetic foot, as confirmed by logistic regression results. This agrees with study [12] but disagrees with a study in Austria by Rossboth S, et al. [25]. The inconsistency among studies may result from variations in population characteristics and clinical management, as patients with well-controlled hypertension may not exhibit a measurable increase in diabetic foot risk [26]. Cerebrovascular disease, retinopathy, and nephropathy were also significantly associated with diabetic foot. These findings consistent with study [10]. Dyslipidemia showed a significant association with diabetic foot, likely due to its pro-atherogenic effects and contribution to peripheral vascular disease. These results align with a study in India by Rathnaganpathi and Raghupathy [27], which found that dyslipidemia is a major comorbidity in this study and that peripheral arterial disease is associated with diabetic foot. Conversely, a study in Nigeria by Aliyu R et al. [28] found no statistically significant association. The lack of significant association between dyslipidemia and diabetic foot across studies can be explained by differences in the definitions of dyslipidemia and the use of lipid-lowering therapies. Peripheral neuropathy is significantly associated with diabetic foot in the present study as confirmed by logistic regression results. Similarly, a study [14] reported that peripheral neuropathy was a significant independent predictor of diabetic foot ulcer. This can be explained as the loss of protective sensation, autonomic dysfunction, and foot deformities, which increase the risk of unrecognized trauma and ulceration.

Corns, calluses, and foot deformities were significantly more common among cases, as confirmed by logistic regression results. These findings are consistent with those reported in other studies, such as [9] and [29] respectively. Failure to use therapeutic footwear was significantly associated with diabetic foot, as reported in study [30] while it disagrees with another study [28]. The discrepancy may be due to study design and footwear use, as improper shoes increase ulcer risk. Poor foot hygiene was significantly associated with diabetic in foot in current study. These findings agree with a study in India in by Chellan G.et al [31]. Infrequent foot inspection was significantly associated with diabetic foot, which is consistent with study [14] but disagrees with study [13]. The plausible reason for this discrepancy could be differences in participants' feet inspection behavior. Low awareness of foot-care practices and non-use of emollients were significantly associated with diabetic foot, as confirmed by logistic regression results. Similar to these findings, a study in India by Nongmaithem [32] reported that most patients with diabetic foot had lack of knowledge regarding foot care, while a study done in Ethiopia by Hirpha et al. [33] found that 63.5% never applied a moisturizing cream to lubricate dry skin. Also, a study by Oe et al. [34] showed that application of a moisturizer could help relieve dry feet. Conversely a study by Woldemariam et al. [14] found that using moisturizing cream between toes was positively associated with diabetic foot ulcer. The difference may result from proper versus improper moisturization; correct use prevents dryness, while application between the toes may increase fungal infection and diabetic foot risk.

Conclusion.

Diabetic foot was more common among older, male and unemployed patients. It was strongly associated with poor glycemic control, neuropathy, smoking, physical inactivity, high BMI, poor foot care, and longer diabetes duration, with neuropathy and poor glycemic control being the strongest predictors. These findings support integrating routine diabetic foot and neuropathy screening into primary care, with emphasis on strict glycemic control, patient education, lifestyle modification, and risk-based follow-up for high-risk patients. This study had some limitations, and the retrospective nature of this study data was collected through patient interviews, which may introduce recall bias. Potential selection bias, as cases and controls may not be fully comparable. The study estimates associations (odds ratios) but cannot measure incidence or absolute risk.

Ethical Approval.

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with verbal and analytical approval before sample was taken. The study protocol, the subject information and consent form were reviewed and approved by a local ethics committee according to the document number (Research ID 2025097) in April 10 ,2025.

Disclosure Statement.

Authors declare no Conflicts of Interest.

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Data Availability.

All data associated with the current manuscript can be requested from the corresponding author upon reasonable request.

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Data Sharing Statement.

The data supporting the findings of this study are included in the article. Further details can be obtained from the corresponding author.

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АННОТАЦИЯ.

Введение: Диабетическая стопа является одним из наиболее серьезных осложнений сахарного диабета 2 типа, часто приводящим к язвам, инфекциям и ампутациям. Цель**.** **исследования:** оценить факторы риска развития диабетической стопы у пациентов с сахарным диабетом 2 типа. Методы: Было проведено исследование «случай-контроль», включавшее 200 пациентов с сахарным диабетом 2 типа, отобранных методом удобной выборки. 100 пациентов с диагнозом диабетической стопы и 100 пациентов с сахарным диабетом 2 типа без диабетической стопы. Использовался множественный логистический регрессионный анализ.

Результаты: Наиболее распространенным был пожилой возраст, большинство пациентов были старше 60 лет, соотношение мужчин и женщин составляло 3:2. Многофакторная логистическая регрессия выявила следующие независимые предикторы: HbA1c ≥7% (ОР=59,47, p<0,001), длительность диабета ≥15 лет (ОР=59,66, p<0,001), нейропатия (ОР=7,82, p=0,008), гипертония (ОР=8,99, p=0,003), безработица (ОР=14,33, p=0,032), деформации стопы (ОР=22,32, p=0,014), наличие мозолей и натоптышей в анамнезе (ОР=51,67, p=0,001), недостаточная осведомленность об уходе за стопами (ОР=4,51, p=0,031) и неиспользование смягчающих средств (ОР=21,36, p=0,002). **Заключение:** Диабетическая стопа тесно связана с множеством модифицируемых факторов риска. Ранняя диагностика и правильное лечение имеют решающее значение для снижения осложнений и улучшения результатов лечения. **Ключевые слова:** Диабетическая стопа, Уход за стопами, Периферическая нейропатия, Фактор риска.

რეზიუმე

შესავალი: დიაბეტური ტერფი მე-2 ტიპის შაქრიანი დიაბეტის ერთ-ერთი ყველაზე სერიოზული გართულებაა, რომელიც ხშირად იწვევს წყლულებს, ინფექციებს და ამპუტაციებს.

კვლევის მიზანი: მე-2 ტიპის დიაბეტით დაავადებულ პაციენტებში დიაბეტური ტერფის რისკ-ფაქტორების შეფასება. მეთოდები: ჩატარდა შემთხვევა-კონტროლის კვლევა, რომელშიც მონაწილეობდა 200 მე-2 ტიპის დიაბეტით დაავადებული პაციენტი, რომლებიც შეირჩნენ მოხერხებული შერჩევის ტექნიკით. 100 პაციენტი დიაბეტური ტერფის დიაგნოზით და 100 მე-2 ტიპის დიაბეტით დაავადებული პაციენტი დიაბეტური ტერფის გარეშე. გამოყენებული იქნა მრავლობითი ლოგისტიკური რეგრესიული ანალიზი. შედეგები: ხანდაზმული ასაკი ჭარბობდა, უმეტესობა ≥60 წლის იყო, ხოლო მამაკაცთა და ქალთა თანაფარდობა იყო 3:2. მრავალცვლადიანი ლოგისტიკური რეგრესიით დამოუკიდებელ პროგნოზირებად ფაქტორებად გამოვლინდა HbA1c ≥7% (OR=59.47, p<0.001), დიაბეტის ხანგრძლივობა ≥15 წელი (OR=59.66, p<0.001), ნეიროპათია (OR=7.82, p=0.008), ჰიპერტენზია (OR= 8.99, p=0.003), უმუშევრობა (OR= 14.33, p=0.032), ტერფის დეფორმაციები (OR=22.32, p=0.014), კოჟრებისა და კოჟრების ისტორია (OR =51.67, p=0.001), ტერფის მოვლის შესახებ ცნობიერების ნაკლებობა (OR=4.51, p=0.031) და დამარბილებელი საშუალებების არგამოყენება (OR=21.36, p=0.002). დასკვნა: დიაბეტური ტერფი მჭიდრო კავშირშია მრავალ მოდიფიცირებად რისკ-ფაქტორთან. ადრეული იდენტიფიცირება და სათანადო მართვა აუცილებელია გართულებების შესამცირებლად და შედეგების გასაუმჯობესებლად.

საკვანძო სიტყვები: დიაბეტური ტერფი, ტერფის მოვლა, პერიფერიული ნეიროპათია, რისკ-ფაქტორი.