Evidence Summary on Foot Management for High Risk Diabetic Foot Patients

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Abstract: Objective: To retrieve, appraise and summarize evidence for high risk diabetic foot patients. Methods: The computer system searched CNKI, JBI database, Australian Diabetic Foot Network (ADFN), IWGDF, NICE, PubMed and other databases for all the evidence on foot management in patients with high-risk foot diabetic. Results: Finally, 12 articles were screened, including 5 evidence summaries, 4 clinical practice guidelines, 2 expert consensuses, and 1 systematic review. Sixteen pieces of best evidence were summarized in five aspects: risk assessment, screening, prevention, glycemic control, and foot management of diabetic foot.Conclusion: The best evidence on foot management programs for patients with high-risk foot diabetes mellitus can also provide a reference for clinical practitioners to carry out clinical practice while formulating relevant symptom management programs.

***Keywords*:** high-risk diabetic foot, evidence-based nursing, evidence summary

1. Introduction

Diabetic foot (DF) is one of the serious complications of diabetes, characterized by a high rate of disability and mortality[1]. High-risk diabetic foot refers to diabetic patients who have severe peripheral neuropathy, autonomic neuropathy, and peripheral vascular disease in their feet, with the risk of developing foot ulcers but without open sores[2]. There are currently a large number of diabetics in China, with around a million people at high risk or already diagnosed with DF [3]. Foot management is an important measure to prevent diabetic foot, and the development of diabetes and DF health education can reduce the amputation rate, incidence, and recurrence rate of foot ulcers in patients [4]. Based on the evidence-based method, this study extracted and summarized the evidence of foot management in DF patients, so as to provide a basis for clinical medical staff to intervene in patients' feet.

2. Information and Methods

2.1 Establishment of issues and criteria for inclusion of evidence

This study identified evidence-based questions based on the PIPOST model [8].The inclusion criteria were: (1) P were patients with grade 0 to 3 diabetes who met the IWGDF risk factor classification system [9]; (2) I include foot risk assessment, screening, prevention, blood glucose control and foot management measures for patients with high-risk foot diabetes; (3) P is a medical officer; (4) O refers to disease-related knowledge, foot care ability, self-management ability and blood glucose index; (5) S is the department of burn plastic wound repair and endocrinology; (6) T is evidence summary, guidelines, expert consensus and systematic review.Exclusion criteria: (1) the content of the literature did not match the subject; (2) low-quality literature.

2.2 Evidence Search

According to the top-down search principle of the "6S" model, databases such as China National Knowledge Infrastructure (CNKI), Australian Diabetic Foot Network (ADFN), National Institute for Clinical Excellence (NICE), BMJ Clinical Evidence, and PubMed were searched. The search period is from the inception of the database to 1 September 2024.

The search terms in Chinese and English are: "diabetic foot", "diabetic high-risk foot", "high-risk foot", "diabetic foot care", "diabetic high-risk foot care", "high-risk foot care", "diabetic foot ulcer", "peripheral neuropathy", "prevention", "management".

2.3 Literature quality evaluation criteria

Different types of documents have different quality evaluation tools. Two investigators independently evaluated the

included literature, and a third evidence-based nursing expert was asked to identify discrepancies.(1) Summary of evidence: CASE evaluation, a quality evaluation tool. (2) Guidelines: Use the Clinical Practice Guidelines Research and Evaluation System I (AGREE II) evaluation tool.(3) Expert consensus: use the 2013 version of the JBI expert consensus evaluation tool. (4) Systematic review: The 2013 version of the JBI systematic review tool was used for evaluation.

3. Results

3.1 Basic information of the included literature

A total of 12 articles were included in this project, including 5 evidence summaries [1-5], 4 guidelines [6-9], 2 expert consensus [10-11], and 1 systematic review [12]. See Table 1.

Table 1. Basic information on the inclusion of literature

Included Literature	Publication Time	Evidence Quality	Evidence Source	Literature content
Geysa Lopes[1]	2023	Summary of the evidence	JBI	Diabetic foot ulcers: stress-relieving interventions
Susan Bellman[2]	2022	Summary of the evidence	JBI	Diabetic foot ulcers: telemedicine
Kylie Porritt[3]	2021	Summary of the evidence	JBI	Diabetic foot: Preventive foot care
Le, Long Khanh-Dao[4]	2020	Summary of the evidence	JBI	Diabetes: Foot care
Le, Long Khanh-Dao[5]	2021	Summary of the evidence	JBI	Diabetic: Self-management education
IWGDF[6]	2023	Guideline	IWGDF	Prevention and management of diabetes-related podiatry
NICE[7]	2023	Guideline	NICE	Diabetic Foot Problems: Prevention and Management
ADFN[8]	2023	Guideline	ADFN	Australian guidelines for diabetic-related podiatry
Ran Xingwu[9]	2019	Guideline	CNKI	Guidelines for the prevention and treatment of diabetic foot in China
Wang Aiping[10]	2023	Expert consensus	CNKI	Clinical pathway for the diagnosis and treatment of diabetic foot in China
Yang Bohua[11]	2019	Expert consensus	CNKI	Chinese expert consensus on the prevention and treatment of diabetic foot with integrated traditional Chinese and Western medicine
Edgar J.G.Peters[12]	2023	Systematic review	PubMed	Interventions in the management of diabetes-related foot infections

3.2 Quality evaluation results of the included literature

3.2.1 Methodological quality assessment criteria for the summary of the included evidence

Five thematic evidence summaries were included in this review . Items 3, 4 and 5 were evaluated as "partially yes"; The evaluation results of item 9 are all "no", and the quality evaluation results of the remaining items are "yes". Five studies, high-quality evidence, included.

3.2.2 Methodological quality evaluation criteria for the included guidelines

Four guidelines were included in this study and evaluated with AGREE II., of which 2 had a score >of 60% in 60% in 6 domains and a grade A recommendation, and 2 papers scored 5 in a field of > 60% and a grade B recommendation. Four studies were included in the study design with a complete design.

3.2.3 Criteria for evaluating the methodological quality of the included expert consensus

Two expert consensus articles were included in this study, and the quality evaluation of six items in the two expert consensus articles was "yes", and the included literature was of high quality and was adopted.

3.2.4 Review of literature quality included in systematic reviews

In this study, one systematic review was included, and only item 5 of the literature was rated as "unclear", and the remaining items were assessed as "yes" for methodological quality.

4. Synthesis of evidence from the included literature

In this study, the evidence of foot management in patients with high-risk foot diabetes mellitus was summarized according to the principle of evidence integration, and finally the evidence was summarized from five aspects: risk assessment, screening, prevention, blood glucose control and foot management, and 16 best pieces of evidence were generated. See

Table2.

Table 2. Summary of best evidence

Evidence topic	Content of the evidence	Evidence grade	Recommend strength
Risk assess	1. All patients with diabetes should be assessed using a risk stratification tool to determine their risk of developing foot complications	II	A
Screening	2. To assess the risk of foot ulcers in diabetic patients, all diabetic patients should be screened	I	B
	3. If the diabetic patient has protective sensory loss or peripheral arterial disease, use a clinical history and further foot examination to expand screening	II	A
	4. Screening of diabetic patients at risk of foot ulcers (IWGDF risk 1-3): limited joint mobility; abundant callus; the presence or progression of foot deformities; any pre-ulcer signs on the feet; and the diagnosis of end-stage renal disease	III	A
Prophylaxis	5. All people with diabetes should be educated on diabetes self-management, including topics such as eating healthy, being physically active, taking medications, reducing risks and complications, and addressing problems.	I	A
	6. Patients with high-risk foot DF (IWGDF risk level 2 to 3) should have daily self-monitoring of foot skin temperature to determine whether there are early signs of foot inflammation	II	B
	7. For people with diabetes who are at risk of foot ulcers (IWGDF risk 1-3), nerve decompression procedures are not recommended to help prevent foot ulcers	III	B
Blood sugar monitoring	8. It is recommended that patients with diabetes mellitus at high risk foot (IWGDF 1-3) strictly control blood glucose ; When emergency debridement is indicated, glycemic control goals can be relaxed, but hypoglycemia should be avoided	I	A
	9. Strict control of blood glucose can reduce the occurrence of DFU and help reduce the occurrence of diabetic microvascular complications	II	A
	10. A glycosylated haemoglobin target of 7.0% (53 mmol/mol) in patients with type 2 diabetes is reasonable for reducing the risk of microvascular and macrovascular disease	II	B
Feet manage	11. Daily foot care is recommended for patients with high-risk foot diabetes (IWGDF 1-3): a Daily foot examination to observe whether the skin of the foot is intact; b. Moisturizer should be used when the skin is dry; c. Keep the feet and foot seams clean and dry, and trim the toenails into a "one" shape	I	B
	12. Patients with DF (IWGDF risk 1-3) should receive structured education (including medical history, foot examination, footwear examination, and self-care) to improve their knowledge of foot care and translate it into effective action	III	A
	13. Patients at risk of foot ulcers (IWGDF risk 1-3) cannot walk barefoot or wear thin-soled shoes to avoid foot trauma. Shoes: Shoes that fit the shape of the foot and have foot protection, including sufficient length, width, and depth.	I	B

5. Conclusion

This project uses an evidence-based approach to summarize the best evidence from five aspects of foot management: risk assessment, screening, prevention, blood glucose control and foot management in patients with high-risk foot diabetes, in order to form patients' intention to take care of healthy feet and transform them into lasting foot care behaviors. In the process of practice, the medical policy of the institution should be fully considered, its facilitating factors and obstacle factors should be fully evaluated, and the obstacles in the practical application of evidence should be analyzed and solved into an operational plan.

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References

[1] Lopes, Geysa. Diabetic Foot Ulcers: Pressure Relieving Interventions.2023.
[2] Bellman, Susan. Diabetic Foot Ulcer: Telemedicine (Effectiveness).2022.
[3] Porritt, Kylie & Pamaiahgari, Priyanka. Diabetic Foot: Preventive Foot Care. (2023).
[4] Le, Long Khanh-Dao. Diabetes: Foot Care (Older People). (2020).
[5] Le, Long Khanh-Dao. Diabetes (Non-Hospitalized Patient): Self-Management Education.(2021).
[6] IWGDF Working Group on the Diabetic Foot. IWGDF Guidelines on the prevention and management of diabetes-related foot disease [EB/OL](2023-05-13)
[7] National Institute for Health and Clinical Excellence. NICE Guideline: Diabetic Foot Problems: Prevention and Management [EB/OL].(2023)[2023-12-10].
[8] Van Netten JJ, Lazzarini PA, Armstrong DG, et al. Diabetic Foot Australia Guideline on Footwear for People with Diabetes [J]. Foot Ankle Res,2018,11(1):2.

[9] Chinese Society of Diabetes, Chinese Society of Infectious Diseases, Chinese Society of Tissue Repair and Regeneration. Chinese Journal of Diabetes Mellitus,2019,11(2):92-108.
[10] Diabetic Foot and Peripheral Vascular Disease Group, Chinese Society of Diabetes Mellitus, Wang Aiping,. Chinese Journal of Endocrinology and Metabolism,2023,16(2):93-102.
[11] YANG Bohua. Chinese expert consensus on the prevention and treatment of diabetic foot with integrated traditional Chinese and Western medicine (1st edition)[J].Journal of Vascular and Endovascular Surgery,2019,5(5):379-402.
[12] Peters EJG, Albalawi Z, van Asten SA, et al. Interventions in the management of diabetes-related foot infections: A systematic review. 2023 Oct10:e3730.