

DIABETIC FOOT SYNDROME IN THE KHOREZM REGION: ETIOLOGY, EARLY DIAGNOSIS, AND MODERN PREVENTIVE APPROACHES

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<https://doi.org/10.5281/zenodo.15770719>

Abstract: This article explores the etiological factors behind diabetic foot syndrome (DFS) among diabetic patients in the Khorezm region, the role of radiological diagnostic methods in disease detection, and the potential to prevent amputations through early diagnosis. A retrospective analysis was conducted on medical records of 118 DFS patients observed between 2021 and 2023 at two major regional medical institutions. The study confirmed the high sensitivity of tomographic methods such as MRI and CT in early diagnosis. Furthermore, the article presents prevention strategies and provides recommendations for improving regional healthcare protocols for DFS.

Keywords: diabetic foot, Khorezm region, MRI, CT, angiography, osteomyelitis, early diagnosis, prevention.

Introduction

Diabetic foot syndrome (DFS) is a complex of infectious-inflammatory and ischemic disorders affecting the soft tissues and bones of the foot in patients with diabetes mellitus. According to the World Health Organization (WHO) 2022 report, nearly 1 million people worldwide undergo limb amputation each year due to DFS [1]. As of 2023, the Ministry of Health of Uzbekistan reported 28,415 registered diabetic patients in the Khorezm region, of whom approximately 9.2% (around 2,600 patients) were diagnosed with DFS [2].

DFS is often detected at later stages, which leads to an increased risk of complications, infections, and ultimately amputations. Therefore, early diagnosis and the use of modern radiological techniques are considered essential strategic approaches in managing the disease.

Etiological Factors

Analysis conducted in the Khorezm region identified the following key contributing factors to the development of DFS:

1. **Hyperglycemia** – High blood glucose levels damage vascular walls and nerve fibers.
2. **Peripheral neuropathy** – Reduced foot sensitivity leads to unnoticed microtraumas.
3. **Ischemia** – Impaired blood circulation in the limbs causes tissue hypoxia.
4. **Inflammation and infections** – Poor hygiene promotes rapid bacterial infections.
5. **Improper care** – Tight footwear, excessive pressure, and lack of hygiene worsen the condition.

Materials and Methods

Study type: Retrospective observational study

Period: 2021–2023

Location: Khorezm Regional Central Hospital and Urgench City Multidisciplinary Hospital

Sample: 118 patients diagnosed with DFS

Inclusion criteria:

- Age ≥ 18 years
- Type 1 or 2 diabetes
- DFS stages 2–4 (Wagner classification)
- Underwent MRI, CT, or radiological imaging

Exclusion criteria:

- Pregnant women
- Contraindications to MRI
- Incomplete medical records

Diagnostic methods:

- **Radiography** – Detection of bone deformities and osteolysis
- **Magnetic Resonance Imaging (MRI)** – Identification of osteomyelitis, abscess, and phlegmon
- **Computed Tomographic Angiography (CTA)** – Assessment of vascular condition, thrombosis, and ischemia
- **Statistical analysis:** χ^2 and ANOVA tests using SPSS 26.0 software

Results

1. Sensitivity and Accuracy of Diagnostic Methods

Diagnostic Method	Sensitivity (%)	Accuracy (%)
Radiography	66%	70%
MRI	91%	88%
CT Angiography (CTA)	83%	81%

MRI detected osteomyelitis at earlier stages than radiography, playing a crucial role in clinical decision-making ($p < 0.05$).

2. Wagner Classification and Amputation Rates

Stage	Number of Patients (%)	Amputation Cases (%)
2	41 (34.7%)	2 (4.8%)
3	54 (45.8%)	10 (18.5%)
4	23 (19.5%)	17 (73.9%)

3. Circulatory Disorders Detected by CTA

- Peripheral artery disease – 60%
- Critical limb ischemia – 35%
- Thrombosis – 22%

Of 13 patients who underwent revascularization, 9 (69%) had successful limb preservation.

Discussion

Delayed diagnosis of DFS in the Khorezm region significantly increases the risk of amputation. The study findings demonstrate that MRI is the most sensitive and reliable diagnostic tool, especially in detecting soft tissue inflammation, osteomyelitis, and abscesses.

CT angiography provides essential data on vascular pathologies and the potential for revascularization. Although radiography is not a primary diagnostic tool, it remains useful as an initial screening method.

Conclusion and Recommendations

Conclusions:

1. MRI may serve as the “gold standard” for early detection of diabetic foot syndrome.
2. CT angiography is essential for evaluating blood circulation and surgical planning.
3. Radiography is appropriate only for preliminary assessment.

Recommendations:

- Increase the availability of MRI and CT equipment at the regional level.
- Implement annual screening programs for early DFS detection.
- Strengthen educational campaigns for patients on DFS prevention.
- Establish systematic professional development courses for medical personnel.

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