Volume 9, Nomor 2, Agustus 2025 **ISSN 2623-1581 (Online)**
ISSN 2623-1573 (Print)

INTEGRATIVE MANAGEMENT OF HYPERTENSION, TYPE 2 DIABETES, AND NEUROPATHY IN A COMMUNITY-BASED PRIMARY CARE SETTING : FAMILY MEDICINE APPROACH TO MULTIMORBIDITY

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ABSTRAK

Pasien lanjut usia dengan penyakit kronis ganda memerlukan pendekatan yang tidak hanya berfokus pada aspek klinis, tetapi juga mempertimbangkan dimensi psikososial dan lingkungan. Kedokteran keluarga menyediakan kerangka kerja holistik yang memungkinkan penatalaksanaan terintegrasi dan berkelanjutan dalam sistem pelayanan primer. Tujuan penelitian ini adalah untuk mendeskripsikan manajemen longitudinal seorang pasien perempuan usia 63 tahun dengan hipertensi, diabetes melitus tipe 2, dan neuropati perifer menggunakan pendekatan kedokteran keluarga. Diagnosis ditegakkan berdasarkan evaluasi klinis yang mencakup keluhan sensorik bilateral dan tekanan darah tinggi disertai glukosa darah sewaktu yang tidak terkontrol. Intervensi yang diberikan meliputi metformin, amlodipin, vitamin B12, serta edukasi nutrisi, aktivitas fisik, dan keterlibatan keluarga. Penambahan gabapentin dan glibenklamid dilakukan berdasarkan evaluasi gejala lanjutan. Evaluasi empat minggu menunjukkan penurunan kadar glukosa, tekanan darah yang stabil, serta kemandirian fungsional yang tetap terjaga. Penggunaan kerangka Mandala of Health mengidentifikasi kontribusi faktor biologis, spiritual, dan sosial terhadap kontrol penyakit. Skor APGAR menunjukkan disfungsi parsial pada keterlibatan emosional dan dukungan keluarga, sementara Coping Score dan SCREEM mengindikasikan keterbatasan ekonomi serta keterlibatan aktif dalam pengambilan keputusan kesehatan. Hasil ini menunjukkan bahwa integrasi penilaian biopsikososial dalam praktik kedokteran keluarga mendukung peningkatan kepatuhan, kontrol klinis, dan kualitas hidup pasien lansia dengan kondisi kronis kompleks.

Kata kunci **:** diabetes melitus tipe 2, hipertensi, kedokteran keluarga, neuropati perifer, pelayanan primer

ABSTRACT

Older adults with multiple chronic conditions require a comprehensive approach that extends beyond clinical parameters to include psychosocial and environmental dimensions. Family medicine provides a holistic framework that supports integrated and continuous management within primary care settings. The objective of this report is to describe the longitudinal management of a 63-year-old woman diagnosed with hypertension, type 2 diabetes mellitus, and peripheral neuropathy through a family medicine approach.. Management included metformin, amlodipine, vitamin B12, as well as nutritional counseling, physical activity promotion, and family engagement. Gabapentin and glibenclamide were added in response to persistent neuropathic symptoms. After four weeks, clinical outcomes showed improved glycemic control, stabilized blood pressure, and preserved functional independence. The application of the Mandala of Health framework revealed the influence of biological, spiritual, and social factors on disease control. The Family APGAR score indicated partial dysfunction in emotional involvement and support, while the Coping Score and SCREEM assessment identified economic limitations and suboptimal family participation in health-related decision-making. These findings demonstrate that biopsychosocial assessment tools integrated into family medicine practice support improved adherence, clinical control, and quality of life in elderly patients with complex chronic conditions.

Keywords ***:*** *type 2 diabetes mellitus, hypertension, peripheral neuropathy, family medicine, primary care*

INTRODUCTION

Hypertension and type 2 diabetes mellitus are among the most prevalent chronic conditions worldwide, frequently coexisting in older adults and sharing similar pathophysiological pathways. Both contribute to cardiovascular and microvascular complications, including diabetic neuropathy (Tušek-Bunc et al., 2025; Mahdavi et al., 2025; Fonseca et al., 2023). Their coexistence increases morbidity and mortality, making individualized and context-specific management essential (LeBlanc et al., 2020; Vinker, 2023; Demaerschalk et al., 2022). Chronic hyperglycemia and elevated blood pressure synergistically promote endothelial dysfunction, oxidative stress, and progressive nerve injury, clinically manifesting as peripheral neuropathy characterized by paresthesia, burning pain, and sensory deficits (Gonzalez-Manzanares et al., 2024; Dickerson et al., 2025; Elwenspoek et al., 2022). Managing chronic illness in older adults requires strategies beyond pharmacologic control. Aging is often accompanied by functional decline, limited physiological reserve, and therapeutic inertia, especially in the presence of multiple comorbidities. These challenges necessitate a comprehensive approach integrating behavioral, social, and environmental determinants into long-term care (Bele et al., 2021; Li et al., 2020; Vinker, 2023).

Family medicine provides a structured biopsychosocial framework emphasizing continuity, comprehensiveness, and contextual decision-making. By incorporating patient preferences, household dynamics, and living environments, this approach is strengthened by tools that assess multidimensional health influences (LeBlanc et al., 2020; Lin et al., 2025; Hoffmann et al., 2020). The *Mandala of Health* model supports an ecological understanding by encompassing biological, psychological, spiritual, environmental, and social aspects of well-being. The *Family APGAR* assesses family functionality through adaptability, partnership, growth, affection, and resolve. The *Coping Score* evaluates patients' recognition, acceptance, and capacity to manage illness. The *SCREEM* tool identifies resources and limitations across social, cultural, religious, economic, educational, and medical domains (Lin et al., 2025; Diaka et al., 2021; Short et al., 2024).

By using these instruments, primary care physicians can tailor holistic interventions to each patient's needs. Home visits, family engagement, and structured education further enhance adherence and functional outcomes (Lin et al., 2025; Diaka et al., 2021; Short et al., 2024). This report presents the longitudinal management of a 63-year-old woman with hypertension, type 2 diabetes, and neuropathy using a family medicine approach, demonstrating how structured, multidimensional care can optimize health outcomes in patients with chronic multimorbidity. The objective of this report is to describe the longitudinal management of a 63-year-old woman diagnosed with hypertension, type 2 diabetes mellitus, and peripheral neuropathy through a family medicine approach.

CASE REPORT

A 63-year-old woman presented to the geriatric clinic of a primary healthcare facility reporting persistent tingling sensations in both feet and a constrictive headache involving the entire cranial region. Symptoms had lasted for three and five days, respectively. The tingling remained constant throughout the day and was only partially relieved by weekly medications provided by the local health center. The headache, which emerged upon awakening, was described as band-like in character and unresponsive to over-the-counter analgesics. No history of trauma, visual changes, or febrile episodes was reported. The patient had been diagnosed with hypertension five years earlier and had adhered consistently to antihypertensive therapy. Type 2 diabetes mellitus was diagnosed three years prior, initially triggered by similar neuropathic complaints. Despite regular visits to the health center, antidiabetic medications

were consumed inconsistently due to the patient's perception of symptom resolution. Family history revealed that the patient's father had hypertension. No known familial occurrence of diabetes mellitus was disclosed.

The patient lived with her two youngest sons, aged 22 and 20, who provided minimal assistance with her medical care. Daily activities included housework, child supervision, and food preparation. Physical activity was absent from her routine. Dietary intake comprised two daily meals, primarily consisting of rice, marine fish, and cassava. Fruit intake was restricted to citrus and salacca. No history of tobacco or alcohol use was noted. Clinical examination showed an alert and oriented woman in stable general condition. Blood pressure was measured at 152/91 mmHg, heart rate 78 beats per minute, respiratory rate 18 breaths per minute, body temperature 36.8°C, and oxygen saturation 99%. Height and weight measurements resulted in a body mass index of 32.8 kg/m², consistent with obesity class I. Neurological assessment revealed diminished vibratory sensation in both feet with preserved proprioception and full muscle strength (5/5). Deep tendon reflexes were brisk and symmetrical. No pathological reflexes or signs of central nervous system involvement were observed. Cardiopulmonary and abdominal examinations yielded unremarkable findings. Capillary blood glucose during the visit was 244 mg/dL, while laboratory investigations were deferred.

Uncontrolled type 2 diabetes mellitus with peripheral neuropathy and concurrent essential hypertension was established as the working diagnosis. Initial pharmacological treatment included oral metformin 500 mg three times daily, amlodipine 10 mg once daily, vitamin B12 supplementation, and paracetamol. Non-pharmacological management emphasized dietary modification, daily physical activity, and education targeting both the patient and her household. In response to persistent neuropathic complaints and elevated glucose levels at follow-up, additional therapy with gabapentin 300 mg and glibenclamide 5 mg was prescribed. Improvement was observed after four weeks, with blood pressure controlled at 128/68 mmHg and random glucose reduced to 168 mg/dL. Functional independence remained intact throughout the treatment course.

RESULT AND DISCUSSION

The coexistence of hypertension and type 2 diabetes mellitus in older adults poses a complex clinical challenge, particularly when compounded by peripheral neuropathy. Chronic hyperglycemia and sustained hypertension synergistically impair endothelial function, increase oxidative stress, and reduce peripheral nerve perfusion leading to progressive small fiber neuropathy (Diaka et al., 2021; LeBlanc, M. et al., 2020; Mzembe et al., 2024). In this case, persistent symptoms despite self-medication indicated inadequate glycemic control, which improved following structured pharmacological management. Therapeutic response demonstrated the effectiveness of integrating pharmacologic and non-pharmacologic strategies within the framework of primary care. Metformin, glibenclamide, and vitamin B12, combined with dietary counseling and lifestyle modification, contributed to improved glycemic regulation and reduction of neuropathic symptoms. Gabapentin effectively modulated neuronal excitability, while amlodipine achieved stable blood pressure control (Vinker, 2023; Rademaker et al., 2025; Palacios et al., 2020). These outcomes underscore the value of longitudinal, evidence-based care for chronic disease management.

Clinical improvements extended beyond biological parameters. Application of the Mandala of Health framework revealed multidimensional influences on disease control. Menopause, obesity, and aging contributed biologically, while psychospiritual integrity remained preserved, reflected in the patient's consistent religious engagement and motivation to recover (Vinker, 2023; Lin et al., 2025; Eguia et al., 2020). Family structure offered physical support, though functional engagement was limited, highlighting the need for targeted

caregiver education. Assessment using the Family APGAR score indicated partial dysfunction, particularly in the domains of participation and affection. These deficits were addressed through structured health counseling (Wool et al., 2024; Kandula et al., 2024; Studziński et al., 2021). The patient's Coping Score, initially rated at level 4, suggested partial awareness and action regarding her condition. Targeted interventions facilitated shared responsibility and improved household cooperation. The SCREEM assessment identified adequate sociocultural and religious resources but also revealed economic constraints and limited access to structured medical information. Environmental limitations such as poor ventilation and suboptimal water quality were mitigated through home visits and tailored education (Vinker, 2023; Lin et al., 2025; Falgarone et al., 2022). This case affirms the essential role of family medicine in delivering comprehensive, person-centered care. Sustainable outcomes were achieved through personalized plans, continuous follow-up, and empowerment of both the patient and her support system.

CONCLUSION

This case demonstrates the value of a structured family medicine approach in managing chronic multimorbidity in older adults. Integration of pharmacological treatment, behavioral counseling, and context-specific education led to meaningful improvements in glycemic and blood pressure control, as well as neuropathic symptoms. Functional independence was preserved through regular follow-up, family involvement, and targeted environmental interventions. Tools such as the Mandala of Health, Family APGAR, Coping Score, and SCREEM enriched the assessment of patient context and guided personalized care. Holistic management in primary care settings remains critical for sustaining long-term health outcomes in elderly patients with complex medical conditions.

ACKNOWLEDGMENTS

We would like to express our sincere gratitude to Universitas Tarumanegara for their invaluable support and contributions to the development of this article. Their commitment to academic excellence and research has greatly facilitated the completion of this work.

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