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*Case Report*

# Holistic Primary Care Management of Type 2 Diabetes Mellitus with Controlled Random Blood Glucose and Hyperuricemia in a 59-Year-Old Woman: A Case Report

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**Abstract:**

Type 2 diabetes mellitus is a chronic metabolic disease that requires long-term pharmacological treatment, lifestyle modification, and continuous primary care follow-up to prevent vascular and metabolic complications. This case report describes the holistic assessment and management of a 59-year-old woman with a known history of type 2 diabetes mellitus and hypertension who presented to Layang Primary Health Center with intermittent frontal headache, weakness, easy fatigability, and occasional hand cramps for one week. She reported treatment with metformin, glimepiride, and insulin; however, the documented treatment at the visit consisted of metformin 500 mg and glimepiride 2 mg. Physical examination showed a clinically stable patient with blood pressure of 119/62 mmHg, pulse rate of 78 beats/minute, respiratory rate of 21 breaths/minute, temperature of 36.3°C, and body mass index of 27.8 kg/m² calculated from the recorded weight and height. Random blood glucose was 119 mg/dL and serum uric acid was elevated at 8.1 mg/dL. Metformin and glimepiride were documented at the visit, accompanied by education to limit high-sugar foods, sweet drinks, excessive white rice, red meat, and high-purine foods, together with advice to increase water intake and attend monthly follow-up. The case highlights the importance of integrating clinical, dietary, family, and environmental assessment in primary care for diabetes, particularly when glycemic control appears acceptable but comorbid metabolic risks remain present.

**Keywords:** Type 2 diabetes mellitus; Primary health care; Family medicine; Hyperuricemia; Lifestyle education.

## 1. Introduction

Type 2 diabetes mellitus (T2DM) is one of the most important chronic non-communicable diseases in adult primary care. Its burden continues to increase globally and in low- and middle-income settings, where delayed diagnosis, suboptimal follow-up, and lifestyle-related risks frequently contribute to microvascular and macrovascular complications (1),(2). In Indonesia, the clinical challenge is not limited to diagnosis and drug prescription; it also includes the continuity of care, patient understanding of diet and medication, and the ability of families to support behavioral change.

T2DM develops through a complex interaction of insulin resistance, impaired beta-cell function, adiposity, aging, diet, physical inactivity, and genetic susceptibility (3),(4). Diagnosis is usually established by plasma glucose criteria or glycated hemoglobin, while random blood glucose should be interpreted in relation to

symptoms and ongoing treatment (5). Patients may present with classic symptoms such as polyuria, polydipsia, and weight change, but many also report non-specific complaints such as fatigue, weakness, headache, or musculoskeletal discomfort (3),(6).

Primary care management is therefore expected to be holistic. National and international recommendations emphasize individualized glucose-lowering therapy, blood pressure and cardiovascular risk control, nutritional counselling, physical activity, self-monitoring where appropriate, and periodic screening for complications (7),(8),(9). Lifestyle education is particularly important because diet adherence and understanding of self-care remain major barriers among patients with T2DM (10),(11). This report aims to present a primary-care case of T2DM with a history of hypertension and elevated serum uric acid, emphasizing the interpretation of limited clinical data and the role of family-centered education.

## 2. Case Presentation

A 59-year-old woman, a housewife, presented to Layang Primary Health Center in Makassar, Indonesia. Identifying information such as name and detailed address was omitted to protect patient confidentiality. The patient lived with her nuclear family and had health insurance coverage. Family assessment documented a middle-to-upper socioeconomic background, adequate home ventilation, and generally good household sanitation.

The chief complaint was headache. The patient reported intermittent frontal headache for approximately one week. She also complained of weakness, easy fatigue despite the absence of heavy physical activity, and occasional cramps in the hands. She denied fever, flu-like symptoms, cough, dyspnea, epigastric pain, and bowel or urinary complaints. The source record documented a past history of type 2 diabetes mellitus and hypertension. The medication history included metformin 500 mg, glimepiride 2 mg, and insulin. No drug or food allergy, smoking, alcohol use, recent six-month treatment history, or history of malignancy was reported. The family history of diabetes was recorded as absent or unknown in different parts of the source document; therefore, it was treated as not clearly established in this manuscript.

Glasgow Coma Scale score of E4M6V5. Vital signs were within acceptable limits: blood pressure 119/62 mmHg, pulse rate 78 beats/minute, respiratory rate 21 breaths/minute, and body temperature 36.3°C. Weight was 66 kg and height was 154 cm; the body mass index recalculated from these measurements was 27.8 kg/m². General examination of the head, eyes, ears, nose, throat, neck, thorax, heart, abdomen, and extremities did not reveal acute abnormalities. The patient had warm extremities, capillary refill time below 2 seconds, and no documented joint swelling, tophi, or joint tenderness.

The recorded point-of-care investigations on 23 May 2025 showed random blood glucose of 119 mg/dL and serum uric acid of 8.1 mg/dL. No glycated hemoglobin, fasting plasma glucose, post-prandial plasma glucose, lipid profile, serum creatinine, estimated glomerular filtration rate, urine albumin-to-creatinine ratio, electrocardiography, retinal examination, or diabetic foot assessment was documented in the source report.

**Table 1.** Timeline of the case

| Domain | Clinical information | Interpretation |
|---|---|---|
| Before the visit | Known history of T2DM and hypertension; medication history included metformin 500 mg, glimepiride 2 mg, and insulin. | Chronic metabolic disease with cardiometabolic comorbidity. |
| 1 week before visit | Intermittent frontal headache, weakness, easy fatigue, and occasional hand cramps. | Non-specific symptoms requiring clinical evaluation and review of metabolic control. |
| 23 May 2025 | Stable vital signs; random blood glucose 119 mg/dL; serum uric acid 8.1 mg/dL. | Glucose value appeared controlled at that measurement; hyperuricemia was present. |
| At visit | Metformin 500 mg and glimepiride 2 mg documented; dietary and hydration education provided. | Continuation of glucose-lowering therapy with lifestyle education. |
| Planned follow-up | Monthly return to the primary health center for medication continuation and monitoring. | Continuity of care needed; further metabolic and complication screening recommended. |

**Table 2.** Summary of clinical and laboratory findings

| Assessment component | Result |
|---|---|
| Demography | Female, 59 years old, housewife. |
| Main complaint | Intermittent frontal headache for one week, with weakness, easy fatigue, and occasional hand cramps. |
| Past medical history | Type 2 diabetes mellitus and hypertension. |
| Medication history | Metformin 500 mg, glimepiride 2 mg, and insulin were reported; visit treatment documented metformin 500 mg and glimepiride 2 mg. |
| Vital signs | Blood pressure 119/62 mmHg; pulse 78 beats/minute; respiratory rate 21 breaths/minute; temperature 36.3°C. |
| Anthropometry | Weight 66 kg; height 154 cm; BMI 27.8 kg/m², calculated from recorded measurements. |
| General examination | No acute cardiopulmonary, abdominal, or extremity abnormalities documented; CRT < 2 seconds. |
| Laboratory results | Random blood glucose 119 mg/dL; serum uric acid 8.1 mg/dL. |
| Data not available | HbA1c, fasting/post-prandial glucose, renal function, lipid profile, urine albumin, foot examination, and retinal screening. |

The pharmacological treatment documented during the visit was metformin 500 mg and glimepiride 2 mg. The record did not clearly explain whether previously reported insulin therapy was continued, adjusted, or stopped. Non-pharmacological management consisted of counseling to reduce high-sugar foods and beverages, sweet cakes, excessive white rice, red meat, and nuts or other high-purine foods. The patient was advised to increase water intake and return to the primary health center every month for continued medication and monitoring.

The expected outcomes were symptom improvement, maintenance of glycemic control, prevention of hypoglycemia and long-term diabetes complications, better adherence to dietary recommendations, reduction of metabolic risks associated with hyperuricemia, and sustained engagement with monthly primary care follow-up.

At the time of the documented encounter, the patient was clinically stable and received outpatient management. No emergency referral was documented. However, the source report did not provide follow-up data on symptom resolution, repeated blood glucose, HbA1c, blood pressure trend, serum uric acid reassessment, medication adherence, or complication screening after the visit.

**Table 3.** Problem-solving evaluation after family medicine intervention

| Assessment component | Summary from the case | Clinical implication |
|---|---|---|
| Personal aspect | The patient sought care due to headache, hand cramps, weakness, and concern because symptoms persisted for about one week. | A patient-centered explanation is needed so that symptoms are not attributed only to diabetes without adequate evaluation. |
| Clinical aspect | Known T2DM and hypertension; random blood glucose was controlled at the measured visit; serum uric acid was elevated. | Glycemic status requires HbA1c or serial glucose data; cardiometabolic risk assessment should be continued. |
| Internal risk | Dietary pattern included frequent white rice and sweet foods/drinks in the source assessment. | Nutrition counseling should focus on realistic portion control and culturally acceptable diet modification. |
| External risk | Home cleanliness and ventilation were described as good; socioeconomic condition and insurance coverage supported access to care. | Environmental barriers were not prominent, but continuity of chronic disease care remains essential. |
| Family function | APGAR score was recorded as 10; SCREEM domains were generally described as good. | Family support can be used to strengthen adherence to medication, diet, follow-up, and complication screening. |

## 3. Discussion

This case illustrates a common primary care situation in which a patient with established T2DM presents with non-specific symptoms while a single random blood glucose value appears acceptable. The measured random blood glucose of 119 mg/dL does not indicate acute hyperglycemia, particularly because the patient was already using glucose-lowering therapy. Nevertheless, one random value cannot establish overall control; HbA1c, fasting or post-prandial glucose, and symptom correlation would be needed to evaluate the stability of diabetes management (5).

The medication record also requires careful interpretation. Metformin and sulfonylureas remain widely used in T2DM management, but the presence of reported insulin use should prompt clarification of the current regimen, dose, timing, adherence, and hypoglycemia risk (12),(13). Headache, weakness, and hand cramps may be related to many conditions, including sleep disturbance, hydration status, electrolyte imbalance, hypoglycemia, hypertension, musculoskeletal causes, or anxiety. The absence of an HbA1c result, renal function test, and medication reconciliation limits the certainty of clinical interpretation.

The history of hypertension is clinically important even though the blood pressure at the visit was 119/62 mmHg. Patients with T2DM and hypertension have higher cardiovascular and kidney risk, so primary care follow-up should include blood pressure trend monitoring, renal function evaluation, urine albumin testing, lipid assessment, and cardiovascular risk management (14),(15). The case record did not report retinal screening or foot examination, both of which are important for preventing disability from microvascular complications.

Serum uric acid was elevated at 8.1 mg/dL. No acute arthritis, tophi, or joint tenderness was documented, so the available data support hyperuricemia rather than a definite gout attack. Dietary advice to limit high-purine foods and encourage adequate hydration was appropriate as a general measure, but clinical follow-up should distinguish asymptomatic hyperuricemia from gout and evaluate kidney function before considering urate-lowering therapy (16),(17).

The strength of this report is the inclusion of family and environmental assessment. The patient lived in a nuclear family with apparently good family function, adequate home conditions, and health insurance. These factors may support adherence if they are actively integrated into care planning. Family members can help with medication reminders, healthy food choices, observation of warning signs, and attendance at monthly follow-up visits. This holistic approach is aligned with the role of primary health centers in chronic disease management, where treatment success depends not only on drug prescription but also on long-term behavior, access, and family support (7), (9),(10),(18).

The main limitation is incomplete clinical documentation. The source report did not include follow-up outcomes, HbA1c, renal profile, lipid profile, complication screening, or detailed medication reconciliation. In an international case report, these missing data should be transparently acknowledged because they influence the strength of the clinical conclusion. Future management should prioritize structured diabetes review, clarification of insulin use, evaluation of possible hypoglycemia or other causes of weakness and cramps, assessment of cardiovascular and renal risk, and reinforcement of individualized nutrition education.

## 4. Conclusion

A 59-year-old woman with known T2DM and hypertension presented to primary care with headache, weakness, fatigue, and hand cramps. Her random blood glucose was controlled at the measured visit, but serum uric acid was elevated and overall metabolic control could not be fully assessed because HbA1c and other screening tests were unavailable. The case emphasizes that primary care diabetes management should combine medication review, complication screening, cardiovascular and renal risk assessment, nutrition education, and family-based support. Before journal submission, the authors should complete missing clinical follow-up data and obtain documented patient consent for publication.

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