

Research Paper



## Role of community pharmacist in public health intervention on hypertension associate with diabetes

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### ABSTRACT

**Background:** About 70% of diabetic patients experience hypertension, which is roughly twice as frequent in people with diabetes as it is in people without it. variable ethnic, racial, and social groupings have variable rates of co-occurring hypertension and diabetes.

**Objective:** The definition of hypertension in relation to both forms of diabetes, risk factors, signs and symptoms, diagnoses, treatments, and cases are all included in the current research.

**Results:** Importantly, people with diabetes who also have hypertension have a significantly higher risk of vascular problems, and both of these disorders enhance the chance of developing chronic kidney disease.

**Conclusions:** Recent experience using natural medicines to treat diabetes and hypertension.



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## 1. INTRODUCTION

### 1.1. Roles of Community Pharmacist [1]

- Handling prescription drug distribution.
- Making sure that various treatments are compatible.
- Verifying dosage and making sure that all medications are supplied and labelled correctly and safely.
- Monitoring the preparation of any medications (not all are provided ready-made by the manufacturer).
- Maintaining a controlled drug register for governmental and stock control purposes.
- Consulting physicians about prescriptions.
- Dispensing nonprescription medications.
- Supervising a syringe and needle exchange.
- Keeping track of cholesterol and blood pressure levels.
- Arranging for the patient's prescription medications to be delivered budgeting and financial management.
- Managing, supervising, and training pharmaceutical support workers.
- Budgeting and financial management.
- Remaining current with pharmacy procedures, new medications, and their applications.

### 1.2. Diabetes Mellitus with Hypertension

#### 1.2.1. Definitions

##### I. Type of Diabetes

###### A. Type- I Diabetes

- Type 1 diabetes is brought on by the pancreas' inability to produce enough insulin as a result of the loss of beta cells in that organ. This type was previously referred to as "juvenile diabetes" or "insulin-dependent diabetes mellitus" (IDDM).
- A type 1 diabetic's risk for heart disease and stroke is also elevated [2], [3].

###### B. Type II Diabetes

- Type 2 diabetes is caused by the condition insulin resistance, in which cells do not respond to insulin as they should.
- Type 2 diabetes affects about 90% of diabetics [4].

###### C. Gestational Diabetes

- Gestational diabetes, the third main kind of diabetes, appears in pregnant women who have never had diabetes before [5].

##### II. Hypertension

- A condition in which the arterial walls ordinarily experience excessive blood pressure.
- Blood pressure over 140/90 is considered hypertension; BP over 180/120 is considered severe hypertension [6], [7].

### 1.3. Hypertension with Diabetes

#### 1.3.1. Hypertension with Type 1 Diabetes

A third of individuals with type 1 diabetes eventually experience high blood pressure. Diabetes causes small blood vessels in your body damage over time, which stiffens the blood vessel walls. High blood pressure results from this rise in pressure [8].

#### 1.3.2. Hypertension with Type 2 Diabetes

Both type 2 diabetes and hypertension appear to be associated with an increased risk of both conditions. The small blood vessels in your body are harmed over time by diabetes, which stiffens the blood vessel walls. High blood pressure results from this rise in pressure. Your chance of having a heart attack or stroke might significantly rise if you have type 2 diabetes together with high blood pressure.

Approximately 8 out of 10 persons with type 2 diabetes eventually experience excessive blood pressure [9], [10], [11].

### 1.3.3. Hypertension with Gestational Diabetes

High blood pressure is more frequent in women with gestational diabetes. However, pregnant women who control their blood sugar levels are less likely to develop high blood pressure [12], [13].

- Abnormal kidney function
- low platelet count

#### I. Risk Factor [14], [15]

- Advanced age
- Obesity
- Current smoking
- Alcohol
- High cholesterol
- Family history of heart disease
- High fat
- High sodium diet

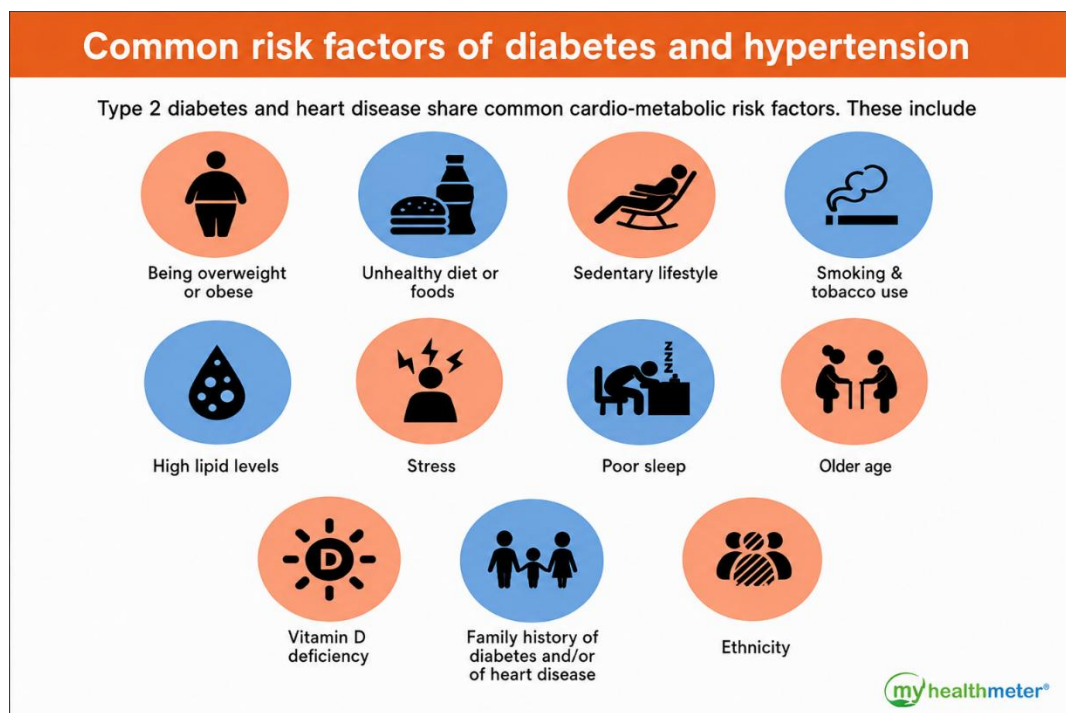


Figure 1. Risk Factors

#### II. Sign And Symptoms [16], [17]

- Extreme weariness
- Feeling extremely hungry and thirsty
- Frequent urination
- Blurred vision
- Wounds that take a long time to heal,
- Pain or numbness in the hands or feet
- Excessive thirst

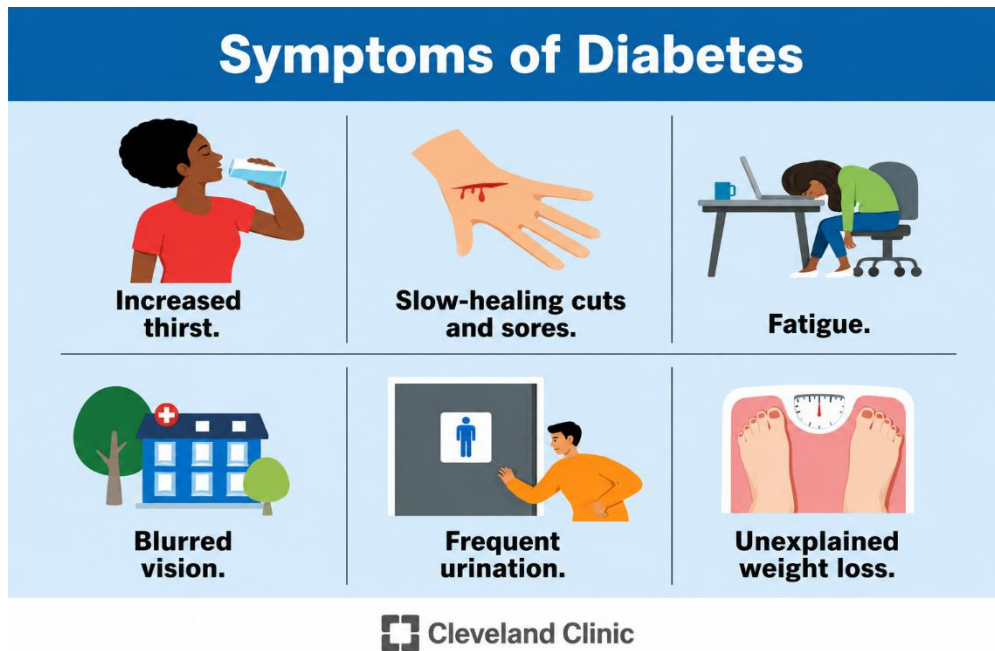


Figure 2. Sign and Symptoms

## 1.4. Diagnosis

### 1.4.1. Diagnosis Test for Diabetes [18]

#### I. Testing of Urine

- Glucosuria
- Ketonuria
- One blood sugar measurement
- Using a fasting glucose test to screen
- Test for oral glucose tolerance

#### II. Other Tests

- Glossy hemoglobin
- Albumin glyated

#### III. Peptide Assay

- Islet autoantibodies
- Screening for diabetes associated complications.

### 1.4.2. Diagnosis Test for Hypertension [19], [20], [21]

**Ambulatory Monitoring:** If you have high blood pressure, it can be determined with this 24-hour blood pressure monitoring test. A more realistic picture of blood pressure variations throughout an average day and night is provided by the gadget used for this test, which measures your blood pressure at regular intervals over a 24-hour period. However, not all medical facilities have access to these technologies, and they might not be covered by insurance.

**Lab Tests:** Your doctor may recommend a urine test (urinalysis) and blood tests including a cholesterol test [22].

**Electrocardiogram (ECG or EKG):** This quick and painless test measures your heart' electrical activity.

## 1.5. Treatment

Most medical professionals start treating patients with ACE inhibitors and ARBS (angiotensin II receptor blockers) first. Other drugs are used to lower blood pressure, but they help slow or stop renal deterioration in diabetics. Diabetes individuals might develop resistant hypertension, making treatment of their hypertension difficult. In addition, diabetic patients are more likely to have cardiac and renal

comorbidities, which may reduce their ability to tolerate severe antihypertensive medication. Therefore, a successful treatment plan must address every component of the intricate metabolic disorders that are prevalent in this population [23].

#### 1.5.1. Metformin HCl [24], [25]

- **Drug Class:** Biguanides
- **Indication:** Control blood sugar level
- **Brand Name:** Gallypride-GI
- **Side Effect:** Dizziness, Diarrhea, Gas, Abdominal pain

#### 1.5.2. Pioglitazole [26], [27]

- **Drug Class:** Thiazolidinediones
- **Indication:** Control Blood sugar level
- **Brand Name:** Glykad-PG
- **Side Effect:** Swelling, edema, upset stomach

#### 1.5.3. Methylcobalamine [28]

- **Drug Class:** Vitamin B12
- **Indication:** Provide Vitamin B12
- **Brand Name:** VibiCol SI

#### 1.5.4. Paracetamol [29]

- **Drug Class:** NSAIDs
- **Indication:** Reduce pain
- **Brand Name:** Dolo 650
- **Side Effect:** Dry mouth, Constipation, Liver damage

#### 1.5.5. Glimepiride [30], [31]

- **Drug Class:** sulfonylureas
- **Indication:** Treatment of type 2 diabetes
- **Brand Name:** Gallypride-g1
- **Side Effect:** Hypro glycemia, Weakness

#### 1.5.6. Rosuvastatin [32], [33]

- **Drug Class:** HMG-CoA reductase inhibitor
- **Indication:** Decrease amount of cholesterol
- **Brand Name:** Roseday A10

#### 1.5.7. Amlodipine [34]

- **Drug Class:** Calcium channel blocker
- **Indication:** Lower the blood pressure

#### 1.6. Medicines Prescribed by

- **Brand Name:** Cortel trio
- **Brand:** Vildasart M 50 MG and 850 MG
- **Drug:** Vildagliptin 50 MG & Metformin HCL 850 MG
- **Dose:** 50MG + 850MG
- **Manufacture by:** Healing Pharma India Pvt. Ltd.



Figure 3. Vildasart

#### 1.6.1. Brand: Aml Pin-M

- **Drug:** Metoprolol succinate prolonged-release and amlodipine Besylat 50 mg
- **Dose:** 50 mg
- **Manufacture by:** USV Private Limited



Figure 4. Amlopin-M

#### 1.6.2. Brand: Glidax M4

- **Drug:** Glimepiride & Metformin HCL SR Release table IP
- **Dose:** 4mg+500 mg
- **Manufacture by:** Daxa Healthcare PVT.LTD



Figure 5. Glidax M4

## 1.7. Current Scenario of Herbal Drugs in Treatment of Diabetes and Hypertension

### 1.7.1. Fenugreek



Figure 6. Fenugreek

- **Biological Source:** Trigonellafoenum
- **Family:** Fabaceae
- **Local Name:** Maithi
- **Chemical Constituents:** It contains trigonelline, flavonoid, glycosides, saponin, ascorbic acid, fenugreekine.

**Medicinal used for Diabetes [35], [36]:** According to multiple clinical studies, fenugreek seeds aid persons with the majority of metabolic symptoms related to both type 1 and type 2 diabetes by reducing blood glucose levels and improving glucose tolerance. One study found that patients with insulin-dependent (type 1) diabetes who consumed 100 grammes of defatted fenugreek seed powder daily experienced significant reductions in their fasting blood glucose levels, enhancements in their glucose tolerance, and drops in their total cholesterol, LDL or "bad" cholesterol, and triglycerides. In a different controlled study, type 2 diabetics who ate a meal with 15 grammes of fenugreek seed powder experienced less of a spike in blood sugar after eating. In a different study, persons with mild but not severe type 2 diabetes who took 2.5 grammes of fenugreek twice day for three months had their blood sugar levels drop [37], [38], [39], [40].

### 1.7.2. Berberine



Figure 7. Berberine

- **Biological Source:** Berberis vulgaris
- **Family:** Berberidaceae
- **Chemical Constituents:** Berberine

**Medicinal used for Diabetes:** The three conditions for which berberine is most frequently prescribed are diabetes, hyperlipidemia, and high blood pressure. It is also used to treat burns, canker sores, liver illness, and many other ailments, but many of these applications lack strong scientific backing. Stronger heartbeats

could result from berberine. People with specific heart issues may benefit from this. The usage of blood sugar by the body may be controlled by berberine. People with diabetes may benefit from this. It may also be able to eradicate microorganisms and lessen edema [41], [42], [43].

### 1.7.3. Prevention and Control

- Take less salt in and do stress-relieving hobbies
- Regular exercise is key to maintaining a healthy weight.
- Avoid drinking too much alcohol quit smoking and limit your exposure to second-hand smoke.

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### Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Pooja Khanpara	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	
Rushi K. Bhimani	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

### Conflict of Interest Statement

The authors declare that there are no conflicts of interest regarding the publication of this paper.

### Informed Consent

All participants were informed about the purpose of the study, and their voluntary consent was obtained prior to data collection.

### Ethical Approval

Not Applicable.

### Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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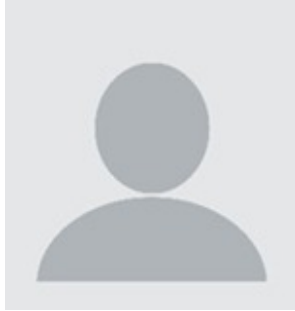
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