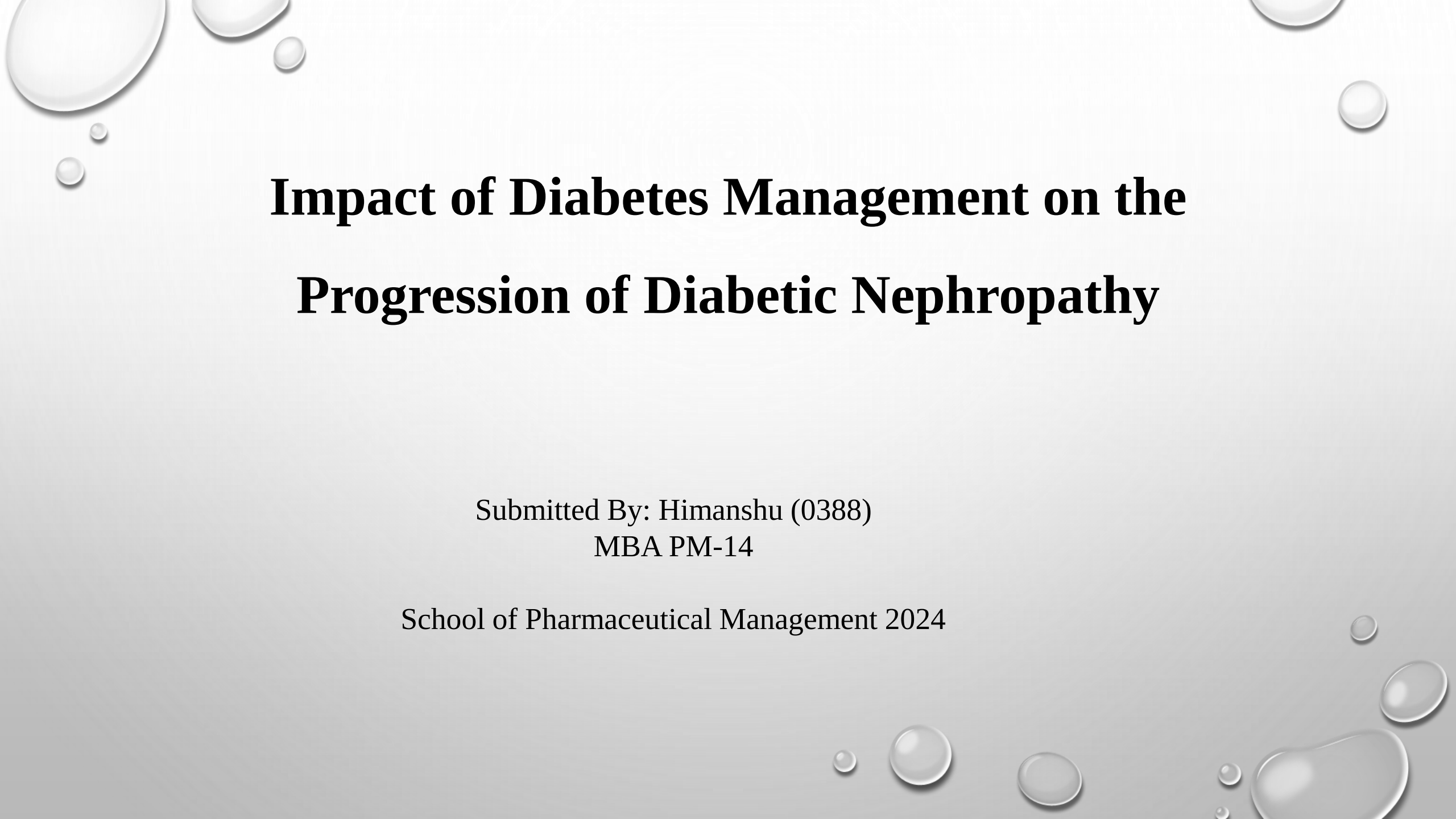




Impact of Diabetes Management on the Progression of Diabetic Nephropathy

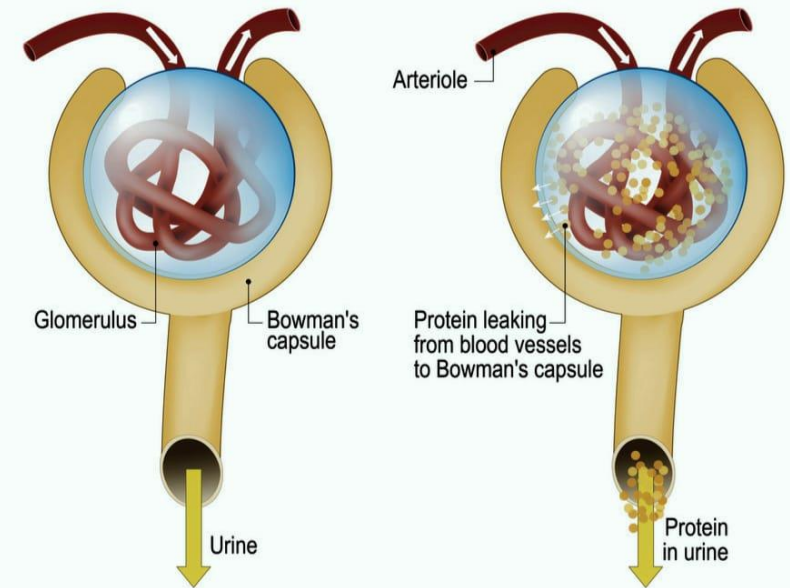
Submitted By: Himanshu (0388)
MBA PM-14

School of Pharmaceutical Management 2024

Introduction

Diabetic nephropathy, a severe complication of diabetes mellitus, is a leading cause of end-stage renal disease (ESRD) and imposes significant clinical and economic burdens. Despite advancements in diabetes management, its incidence is rising due to the increasing prevalence of diabetes. Characterized by progressive kidney damage, diabetic nephropathy involves metabolic and hemodynamic alterations, oxidative stress, inflammation, and genetic factors. Effective management includes tight glycemic control, blood pressure management, RAAS inhibitors, and SGLT2 inhibitors. Challenges such as poor patient adherence, limited access to therapies, and socioeconomic disparities hinder optimal management. This dissertation explores the impact of various diabetes management strategies on nephropathy progression, evaluates current interventions, and identifies barriers to successful management, aiming to improve patient outcomes and reduce the global burden of diabetic nephropathy.

DIABETIC NEPHROPATHY





Problem Statement

The management of diabetes is critical in preventing or delaying the progression of diabetic nephropathy. However, the effectiveness of various management strategies in different populations remains inadequately understood.

Objectives

1. To assess the impact of different diabetes management strategies on the progression of diabetic nephropathy.
 2. To identify the most effective interventions in slowing the progression of nephropathy.
 3. To evaluate the role of patient adherence in the effectiveness of diabetes management.
- 

Hypothesis

Effective diabetes management, characterized by strict glycemic control, regular monitoring, and management of comorbid conditions, will slow the progression of diabetic nephropathy compared to less stringent management practices.

Study Design

An observational, longitudinal study was conducted in multiple diabetic clinics. A total of 300 diabetic patients (150 with type 1 diabetes and 150 with type 2 diabetes) aged 18-65 years, at different stages of nephropathy, were followed for two years.

Data collection involved medical records, patient interviews, and laboratory tests, focusing on variables such as HbA1c, BP, estimated glomerular filtration rate (eGFR), albuminuria, and medication adherence. Statistical analysis was performed using SPSS, with descriptive statistics, correlation analysis, and regression models employed to assess the relationships between diabetes management strategies and nephropathy progression.

Result & Findings

- **Glycemic Control and Renal Outcomes**

Patients achieving better glycemic control ($\text{HbA1c} < 7\%$) exhibited significantly slower progression of nephropathy compared to those with poor glycemic control. Specifically, each 1% reduction in HbA1c was associated with a 40% reduction in the risk of progression to macroalbuminuria. Patients who maintained HbA1c levels below 7% had a mean eGFR decline of 1.5 ml/min/1.73 m² per year, compared to 3.2 ml/min/1.73 m² per year in patients with HbA1c levels above 8%.

- **Pharmacotherapy**

“The use of RAAS inhibitors was associated with a 30% reduction in the risk of developing ESRD. Patients on SGLT2 inhibitors demonstrated a 25% reduction in albuminuria and a slower decline in eGFR compared to those not on these medications. The regression analysis indicated that patients using a combination of RAAS inhibitors and SGLT2 inhibitors had the most favorable renal outcomes, with a mean eGFR decline of 1.0 ml/min/1.73 m² per year.”



Limitations

- **Observational Design:** May introduce biases related to patient self-selection and residual confounding despite adjustment.
 - **Data Quality:** Reliance on self-reported data for some variables may introduce reporting bias.
 - **Generalizability:** Findings may not be generalizable beyond the specific study population or clinical settings.
 - **Loss to Follow-Up:** Attrition over the long follow-up period may impact the study's power and validity.
- 

Interventions

- Glycemic Control
- Blood Pressure Management
- Oral Hypoglycemic Agents
- Continuous Glucose Monitoring (CGM)
- Blood Pressure Management
- Use of Sodium-Glucose Co-Transporter-2 (SGLT2) Inhibitors
- Dietary and Lifestyle Interventions
- Regular Monitoring and Follow-Up



Conclusion

The study on the impact of diabetes management on the progression of diabetic nephropathy yields significant insights into the critical components required for effective disease management. The comprehensive approach adopted in this research, encompassing glycemic control, blood pressure management, the utilization of novel pharmacotherapies, and patient education, has demonstrated marked benefits in slowing the progression of diabetic nephropathy.

