



## Retrospective Study on Diabetes Patients in two different regions in Oman

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### Abstract:

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both. The number of people with diabetes is increasing due to population growth, aging, urbanization and increasing prevalence of obesity and physical inactivity. **Aim:** The aim of this study is to assess different lines of medications prescribed and combination therapy on diabetes management and also to assess the most common associated disease with diabetes in two hospitals in different regions. **Materials and Methods:** A retrospective study was conducted based on 100 prescriptions (from Jan to June 2013) collected randomly for type 1 and type 2 diabetic patients from AL Rustaq hospital and Sinaw hospital in Oman. Prescriptions were classified into two groups according to the type of diabetes studied (T1DM and T2DM). Patients, Age, Gender, diseases associated and medication used were noted. **Results:** A high prevalence of diabetes was observed in T2DM (with 99%) while T1DM about 1% in AL-Rustaq and Sinaw hospital. In T2DM, Metformin is the most prescribed drug followed by Gliclazide as monotherapy in AL-Rustaq hospital. The most prescribed medicine use as monotherapy is metformin (72%) followed by Gliclazide (18%) then glibenclamide (10%) in Sinaw hospital. In combination therapy, metformin+glibenclamide followed by metformin+gliclazide were the most commonly prescribed in AL-Rustaq hospital. In Sinaw hospital the combination therapy in which metformin plus glibenclamide is the most common (53%). Then metformin plus gliclazide (32%), followed by metformin plus gliclazide plus Insulin(N) (5%), then metformin plus glibenclamide plus Insulin(N) (4%) then insulin plus oral hypoglycemic (3%) then insulin(N) plus insulin(R) plus gliclazide (2%) then Metformin plus Insulin(N) plus Insulin (R) (1%). Nearly 50% Males and 50% females having diabetes was in both hospitals. Maximum patients with DM were of the age group (40-49) years. Dyslipidemia is the most common associated disease with diabetes in AL-Rustaq hospital. In Sinaw hospital, the majority of the patients are having hypertension as associated disease (49%), then came coronary heart disease (32%) then dyslipidemia (19%). There are other associated diseases but in limited percentage such as nephropathy, retinopathy, neuropathy, etc. **Conclusion:** In this study prevalence of T2DM was more. Diabetes was found to be in age group (40-49) in AL-Rustaq hospital. This study shows that both genders have same proportion.

**Keywords:** Type 1 diabetes mellitus, Type 2 diabetes mellitus, prevalence, medication management.

### Introduction

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels<sup>(1)</sup>. In 1997, the World Health Organization (WHO) estimated its global prevalence to be more than

135 million, and projections for the year 2025 estimate a 120% increase in the number of people with diabetes throughout the world.<sup>(2)</sup> The number of people with diabetes is increasing due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity. Quantifying the prevalence of diabetes and the number of people affected by diabetes, now and in the future, is important to allow rational

planning and allocation of resources.<sup>(3)</sup>

The prevalence of diabetes is higher in men than women, but there are more women with diabetes than men. The urban population in developing countries is projected to double between 2000 and 2030. The most important demographic change to diabetes prevalence across the world appears to be the increase in the proportion of people 65 years of age.<sup>(3)</sup>

Oman is ranked ninth among countries with the highest prevalence of diabetes in the world, and about 15 per cent of Oman's population is living with the disease. In Muscat alone, over 17 per cent of the population has diabetes higher than the rest of the country.<sup>(4)</sup>

Type 2 diabetes is commonly caused by obesity another major health problem in Oman where, according to a recent local study, three to nine per cent of pre-school children, 12 to 15 per cent of school children, 15 to 45 per cent of adolescents and up to 75 per cent of adult males are obese in the country.<sup>(4)</sup>

Type 1 diabetes accounts for about 5% of all diagnosed cases of diabetes. Type 1 is usually first diagnosed in children and young adults, although it can occur at any time. To survive, people with type 1 diabetes use insulin from an injection or a pump. Risk factors for type 1 diabetes can be autoimmune, genetic, or environmental. At this time, there are no known ways to prevent type 1 diabetes. Type 2 diabetes accounts for about 95% of diagnosed diabetes in adults. Several studies have shown that healthy eating and regular physical activity, used with medication if prescribed, can help control health complications from type 2 diabetes or can prevent or delay the onset of type 2 diabetes.<sup>(5)</sup> If there is too much sugar in our body nerves could become damaged, as could the tiny blood vessels that feed those nerves.<sup>(6)</sup>

For reasons that aren't clear, women who are black, Hispanic, American Indian or Asian are more likely to develop gestational diabetes.<sup>(7)</sup>

The standards of care are intended to provide clinicians, patients, researchers, payers, and other interested individuals with the components of diabetes care, general treatment goals, and tools to evaluate the quality of care. While individual preferences, co morbidities, and other patient factors may require modification of goals, targets that are desirable for most patients with diabetes are provided. Specifically titled sections of the standards address children with diabetes, pregnant women, and people with pre diabetes. These standards are not intended to preclude clinical judgment or more extensive evaluation and management of the patient by other specialists as needed. The recommendations included are screening, diagnostic, and therapeutic actions that are known or believed to favorably affect

health outcomes of patients with diabetes. A large number of these interventions have been shown to be cost-effective.<sup>(8)</sup>

The pain of diabetic nerve damage may also improve with better blood sugar control, though unfortunately blood glucose control and the course of neuropathy do not always go hand in hand. Newer medications for nerve pain include Pregabalin (Lyrica) and duloxetine (Cymbalta).<sup>(12)</sup>

Insulin therapy is undergoing a paradigm shift now a days and at this hour we need to focus on the cardinal principles of initiating, optimizing, and intensifying the treatment for achieving adequate control.<sup>(13)</sup> This may be due to changes in the insulin receptors that bring about the actions of the insulin. Obesity is the main cause of insulin resistance. In most cases over time the patients need to take insulin when oral drugs fail to stimulate adequate insulin release.<sup>(14)</sup>

The aim of this study is to find out is there any significant difference in the prevalence of type1 and type 2 diabetes

### Aim and Objectives

The objective is to review different lines of medications on diabetes management and to study the prevalence of type 1 and 2 diabetes among diabetic in wilayat AL Swauq regions and also find out % of patient who have type I and type II diabetes. We also investigated the prescription pattern of anti-diabetic drugs used in T1DM and T2DM. We also evaluated the most common disease associated with diabetes and also investigated which medicine has more effect in controlling blood glucose.

### Methodology

#### Study Design

A retrospective study was conducted based on 100 prescription (from the Jan to June 2013) collected randomly for type 1 and type 2 diabetic patients from AL Rustaq Hospital in Oman.

Prescriptions were classified into two groups according to the type of diabetes studied (T1DM and T2DM).

Patients age, sex, other diseases commonly associated with diabetes and type of anti diabetic drugs used were noted.

### Sampled Population

Sample size (100)

Age 20-80

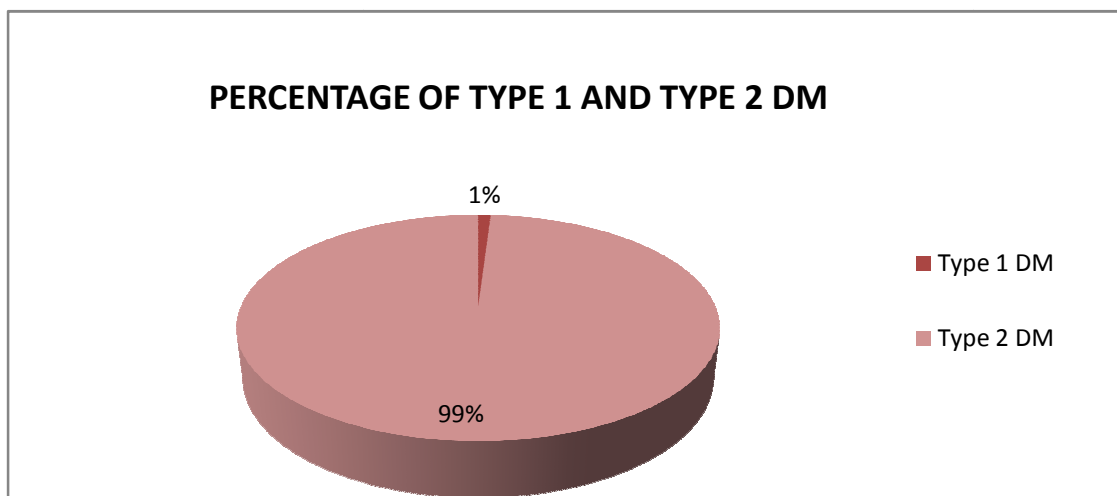
Gender :female and male

### Results:

A high prevalence of diabetes was observed in T2DM (with 99%) while T1DM about 1% in AL-Rustaq hospital.

### PREVELANCE OF TYPE1 AND TYPE2 DIABETES MELLITUS

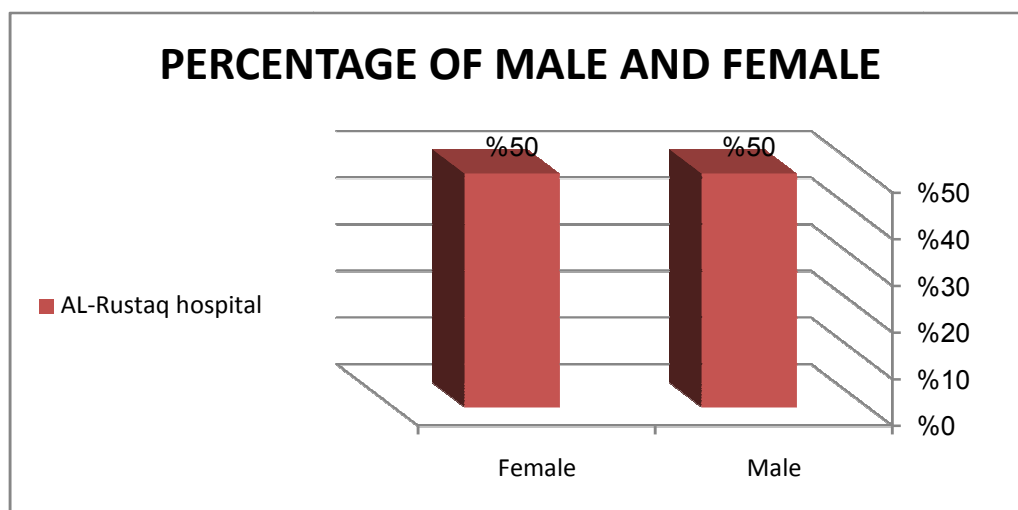
Type of diabetes	Number of prescriptions	percentage
T1DM	1	1%
T2DM	99	99%
Total	100	100%



**Fig.1: plot showing percentage of Type 1DM and Type 2DM**

### PERCENTAGE OF MALE AND FEMALE

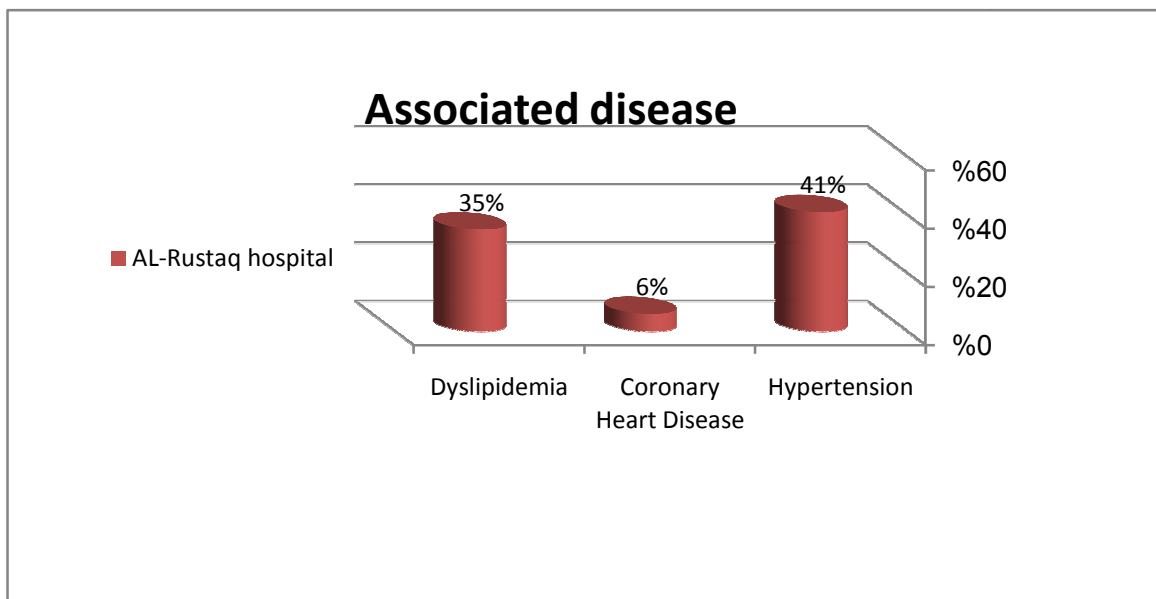
GENDER	MALE	FEMALE
NUMBER OF PRESCREPTION	50	50



**Fig.2: Plot of percentage of male and female with diabetes.**

#### MOST COMMON DISEASES ASSOCIATED WITH DIABETES

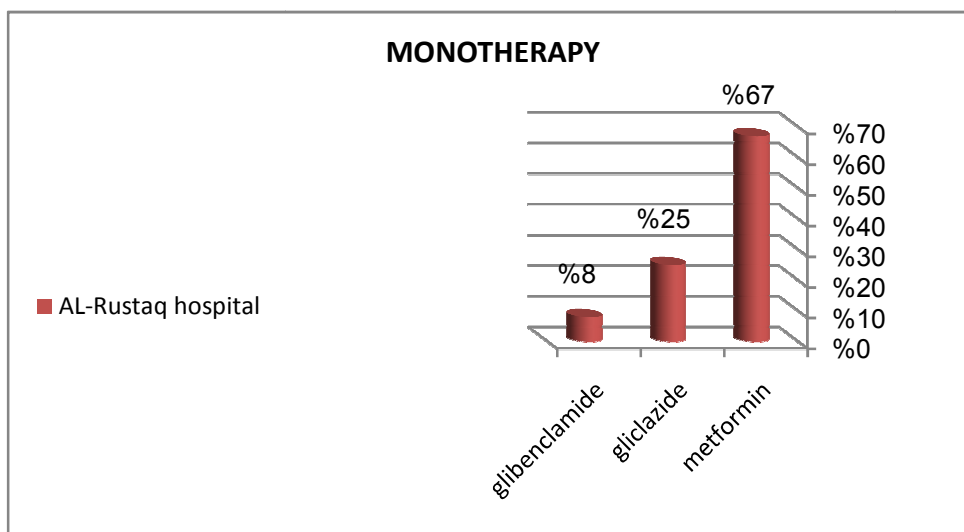
	CHD	DYSLIPIDEMIA	HYPERTION	NO OTHER DISEAS	TOTAL
%	6%	35%	41%	18%	100%



**fig.3: Plot of other disease associated with diabetes**

#### MONOTHERAPY

NAME OF DRUG	DOSAGE FORM	NUMBER OF PRESCRIPTION	%
METFORMIN	Tab.500mg	67	67%
GLICLAZIDE	Tab.60mg,80mg	25	25%
GLIMEPIRIDE	Tab.1mg,2mg,3mg	8	8%
TOTAL		100	100%



**Fig.4: Plot of monotherapy drugs prescribed for type 2 DM**

### COMBINATION THERAPY:

Name of drug	Dosag form	No.of prescription	%
Metformin+Glimepiride	Tab.500mg/2mg	30	30%
Metformin+Glibenclamide	Tab 500mg/2mg	50	50%
Metformin+Gliclazide+insulin N	Tab 500mg/80mg/inj	9	9%
gliclazide+insulin N+insulin R	Tab 80mg/inj	2	2%
Metformin+Glibenclamide+insulin N	Tab 500mg/2mg/inj	3	3%
Metformin+Insuli R+insulin N	Tab 500mg/inj	2	2%
Insulin+oral hypoglycemices	Inj/tab	4	4%
total		100	100%

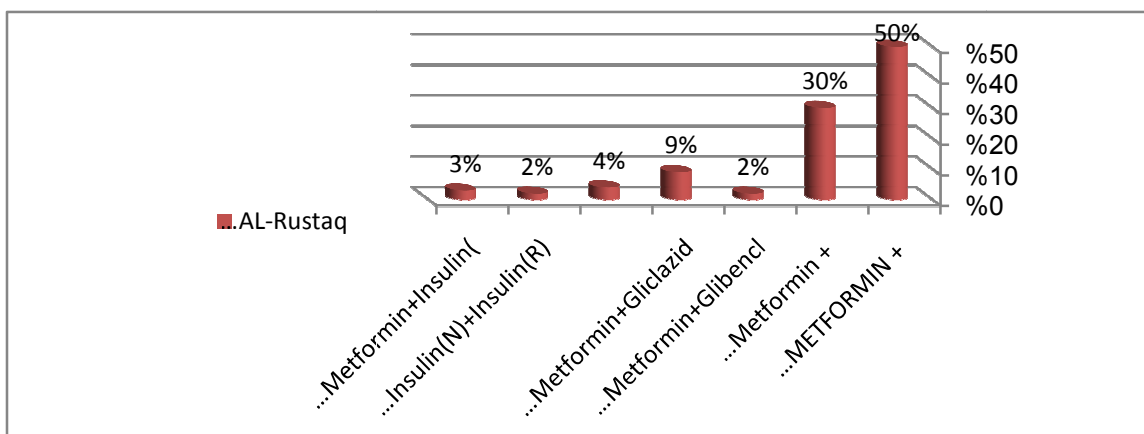


Fig5. plot of combination therapy prescribed for type 2 DM

### Comparison between the effects of monotherapy in control blood glucose

NAME OF DRUG	NO.OF PRESCRIPTION	%
METFORMIN	70	70%
GLICLAZIDE	10	10%
GLIMEPIRIDE	20	20%
TOTAL	100	100%

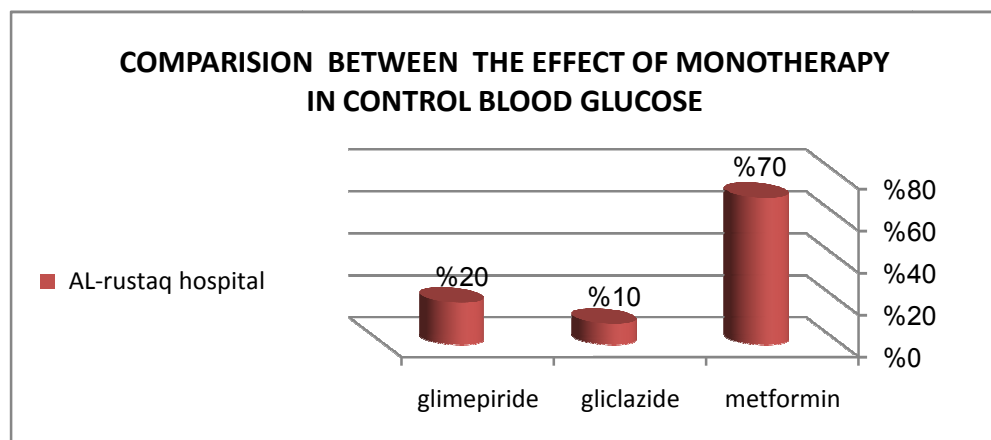


Fig 6:Plot of % of the most drug is effect in controlling blood glucose

### Comparison between the effects of combination therapy in control blood glucose

Name of drug	No.of prescription	%
Metformin+gliclazide	60	60%
Metformin+glibenclamide	2	2%
Metformin+gliclazide+insulin N	10	10%
gliclazide+insulin N+insulin R	5	5%
Metformin+glibenclamide+insulin N	10	10%
Metformin+insulin R+insulin N	10	10%
Insulin+oral hypoglycemics	3	3%
total	100	100%

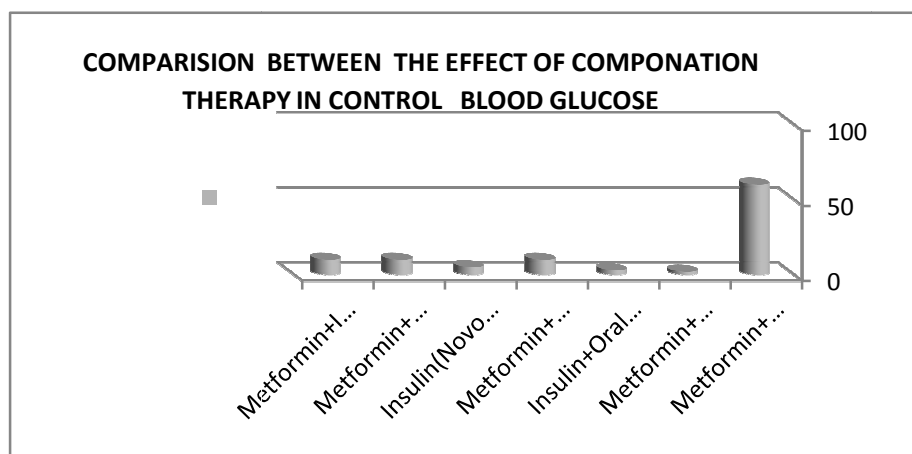


Fig 7:Plot the 5 of the most effective combination therapy in controlling blood glucose

In T2DM, metformin is the most prescribed drug followed by Gliclazide as monotherapy. In combination therapy, metformin+glibenclamide followed by metformin+gliclazide were the most commonly prescribed. Males having diabetes was 50% and 50% females. Maximum patients with DM were of the age group (40-49). Dyslipidemia is the most common associated disease with diabetes.

#### Discussion:

Out of 100 prescriptions, T2DM have high prevalence than T1DM. That include 50% male and 50% female. The age groups that have more prevalence is (40-49 years), this may be due to lack of exercise and bad life style. Hypertension is the most associated disease with diabetes. Metformin is the most prescribed drug followed by gliclazide as monotherapy, because it is the most effective drug in controlling blood glucose.

In combination therapy Metformin+glibenclamide is more prescribed, but gliclazide+insulin N+insulin R and Metformin + insulin R+insulin N. On the other hand Metformin+gliclazide is the most effective combination in controlling blood glucose.

#### Conclusion:

The number of people with diabetes is increasing due to population growth, aging, urbanization and increasing prevalence of obesity and physical inactivity. The objectives of the present study were achieved by retrospectively analyzing 100 prescriptions in 2013 through study Patients Age, Gender, diseases associated, medication used and the most medicine effect in controlling blood glucose. Metformin found to be good in controlling the blood glucose among the monotherapy but in combination therapy of metformin+gliclazide have more effective.

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