

# The Rate of Systemic Hypertension in Type 2 Diabetes Mellitus in Baquba Teaching Hospital

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## Abstract

**Background:** Hypertension is a common disease effect high incidence of population, hypertension more in diabetic patient than other population so if associations of these two diseases in same patients lead to increase the rate of morbidity and mortality from micro and macro vascular complications of diabetes.

**Objective:** To evaluate the incidence of systemic hypertension in patients with type 2 diabetes mellitus in Diyala province.

**Materials and Methods:** Nine hundred patient were divided in 2 groups Group A: 450 diabetic patient were evaluated for hypertension group B: 450 patient without diabetes mellitus as control study measuring blood pressure for all patients including in this study by using a sphygmomanometer at consultation medical unit and diabetic clinic in Baquba Teaching Hospital, patient include in this study usually between age 32 to 70 years. Other data obtained included age, gender, type of DM, weight, height, body mass index and waist hip ratio.

**Results:** In group A: 450 diabetic patient (225 were male and 225 were female) were included in this study. 244 (54.22 %) patient of them have hypertension, 124 were male (50.8%) while 120 patient were female (49.2%) and we found 206 from total number of diabetic patient have no hypertension. While in group B (control group) from 450 non-diabetic patient we found 100 patient (22.2%) of them have hypertension and 350 (77.8%) patient from total number have non-hypertension.

**Conclusions:** Hypertension is more in patient with diabetes type 2 than those with no diabetes. Studies have shown that adequate treatment and well control of the blood pressure will reduce the complications of DM.

**Key words:** Hypertension, type 2 DM, Baquba province

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## Introduction

Hypertension is a common disease effect high incidence of population, Hypertension some time associated with DM in same patients and is said to be two times as incidence in diabetics than in non-diabetic individuals [1]. It has also been shown that elevated blood pressure in DM persons will increase the incidence of macro complication

and micro complication of diabetes mellitus mainly ischemic heart diseases, stroke, diabetic retinopathy and nephropathy [2].

Ischemic heart disease and other macrovascular complication are a common cause of deaths in patients with diabetes mellitus. The incidence of hypertension in diabetic patients increase incidence of death 4 to 5 times more than non-diabetic persons



[3]. Ischemic heart disease and stroke is the common complication of DM and is the common cause of death it is account about 86 % of deaths in patients with type 2 diabetes mellitus [4]. So well control of hypertension will decrease morbidity and mortality of patients with diabetes [5].

Hypertension alone is a high risk factor for cardiovascular morbidity and mortality as established by data from many studies in the last many years ago [6]. From a study by Stamler *et al.*, show any hypertension in diabetes distinctly increases cardiovascular mortality [7].

So the controlling the blood pressure is a commendable goal of antihypertensive therapy, treating hypertensive cardiovascular disease in the diabetic patient is more complex than simply achieving blood pressure targets, studies have shown that the drugs used for elevated blood pressure show a good effect for decreasing the risk of new onset diabetes, on metabolic endocrine surrogate endpoints and possibly on outcome [8]. When the diabetes and hypertension present in same patients, the risk of CVD is increased by 70%, and these increase the morbidity and mortality of an already high-risk population [9]. hypertension and type 2 diabetes when present in same persons with other macro vascular and microvasculr risk factors such as diabetic nephropathy, central obesity, hyperlipidemia, hyper coagulation, and left ventricular hypertrophy[10]. Epidemiologic studies show the co-existence of systemic hypertension and type 2 diabetes and possibly point towards a common genetic and environmental factor promoting both DM and systolic hypertension [11]. Similarly, clustering of hypertension, insulin resistance or frank type 2 diabetes, hyperlipidaemia and central obesity have been documented in several

populations[12].Insulin resistance and central obesity cause, inflammation of tissues and reactive oxygen species (ROS) production lead to dysfunction of endothelium of tissues , increased renin–angiotensin–aldosterone system (RAAS) and increased sympathetic nervous system (SNS) activity have all been implicated in this complex pathophysiology of diabetes and hypertension[13]. In this study, we aimed to find out the incidence of hypertension in patient with DM, attending the Diabetes clinic in Baquba Teaching Hospital.

### **Patient and Methods**

A cross-sectional, descriptive study done in Baquba Teaching Hospital, inpatient and outpatient .The study period was from first of July 2011 to first of March 2012.

Data obtained include age, family history, associated disease, body mass index, duration of DM and hypertension. Diagnosis of patients as Type 2 DM was based on according to WHO definition of diabetes and dependent on diet control and uses of oral hypoglycemic drugs. Hypertension was diagnosed when the patients already on antihypertensive drugs or using a sphygmomanometer, with a systolic blood pressure of  $\geq 140$  mmHg or a diastolic blood of  $\geq 90$  mmHg on at least two reading [7].

**Statistical analysis:** The level of statistical significance was taken as  $P < 0.05$ .

### **Result**

Group A 450 diabetic patient (225 were male and 225 were female) were included in this study. 244 patient of them have hypertension, 124 were male (50.8%) while 120 patient were female (49.2%) and we found 206 from total number of diabetic patient have no hypertension.

**Table (1):** The percentage of hypertension in studied group.

	Total NO.	Hypertension	No hypertension	P-value
<b>Type 2 D.M</b>	450	244 (54.2%)	206 (45.8%)	0.035
<b>Non D.M (control)</b>	450	100 (22.2%)	350 (77.8%)	1.00
<b>Total</b>	900	344 (100%)	656 (100%)	1.00

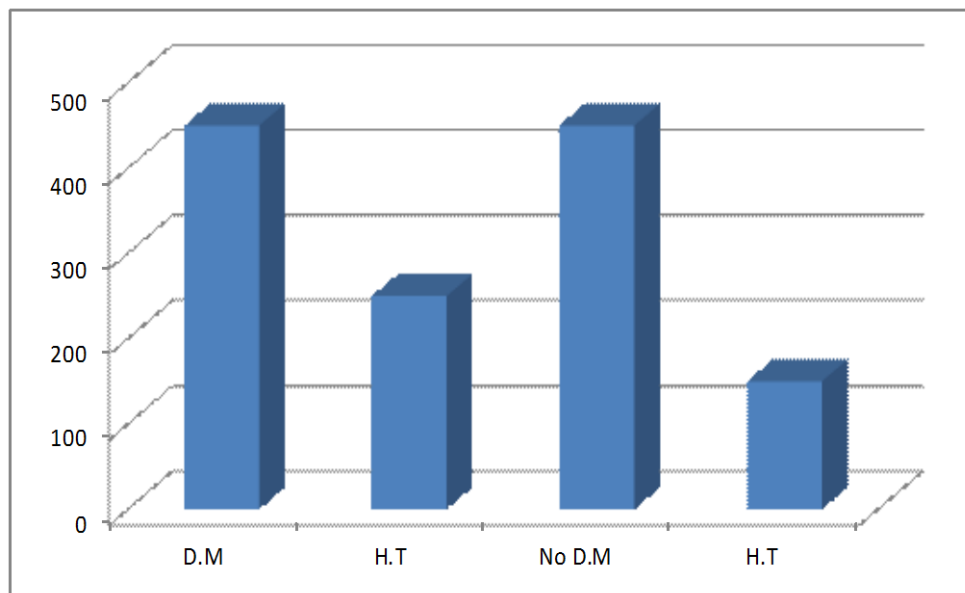
P- value is significant

We found there is no significant difference between gender and hypertension in D.M

**Table (2):** Association between hypertension and gender.

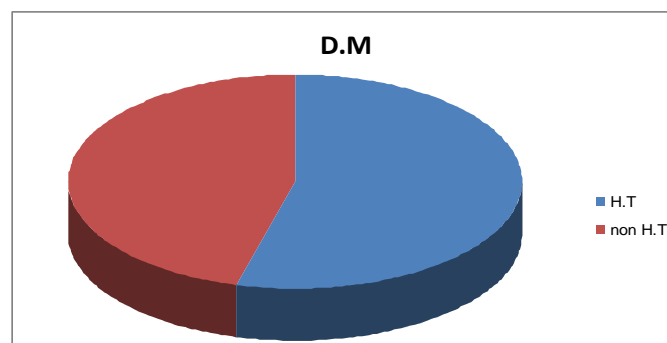
Gender	D.M	H.T	Non H.T
<b>Male</b>	225 (50%)	124 (50.8%)	101 (49%)
<b>Female</b>	225(50%)	120 (49.2%)	105 (51%)
<b>Total</b>	450 (100%)	244 (100%)	206 (100%)
<b>P-value</b>	0.48	0.38	0/59

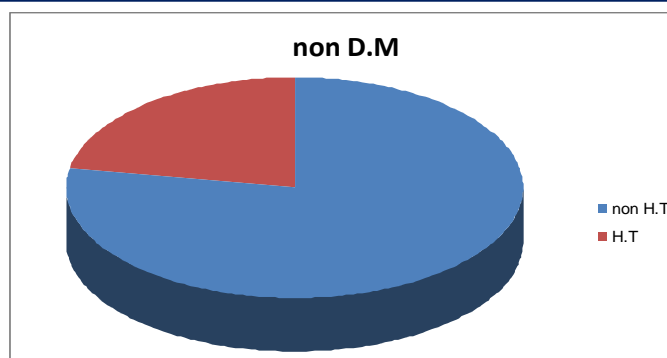
P- value is non-significant



**Figure (1):** Incidence of hypertension in both D.M and non D.M.

Incidence of hypertension in D.M twice more than the incidence of non D.M in same age group of patients





**Figure (2):** incidence of hypertension in both type 2 D.M and non D.M.

Shown the incidence of H.T in type 2 D.M 54.2% while 22.2% in non D.M patient

## Discussion

The coexist of elevated blood pressure and type 2 DM is associated with increase the risk of morbidity and mortality from increase the complication of these tow diseases[28]. Studies in the last decade has found that decrease or control of blood pressure in patients with type 2 diabetes leads to reductions in mortality rate. Joann (2012) believe that effect of hypertension more adverse effect than lowering blood sugar but when coexist of both diseases the incidence of morbidity and mortality is more such as eye complication, which may cause blindness, and renal disease. It is unknown why there is such a significant correlation between the hypertension and DM, but it is widely assumed that many environmental and genetic factors led to a concurrent rise in both conditions [28].

Rate in the present study show incidence of hypertension in type 2 D.M, is slightly twice the incidence of H.T in non D.M patient (54.2% D.M while 22.2% non D.M patient) in the same age group and this due to many causes either due to increased incidence of obesity in diabetic patient or due to complication of D.M .

The H.T in type 2 D.M 54.2% while 22.2% in non D.M patient, agree with study done by Garrow *et al.*; (1985 ) show the incidence of H.T in type 2 D.M 52.2% while 20.1% in non D.M patient [7].

A study done by Rodrigo M Lago *et al* (2007), agree with current study which is show that the incidence of diabetes are increasing in Rodring study and many other study show that the diabetes will rise from more than 150 million in 2000 to 350 million by 2020. The total hypertensive patient is predicted to increase by more than 55% of about billion people by 2020. Elevated blood pressure affects 65% of patients with type 2 DM and twice as common in patient with DM as in those without diabetes [29].

Another study done by Riyadh and Berq (2009), show the incidence of H.T in type 2 D.M patient 50.2% while 21.3% in non D.M. patients [30].

So the control of blood pressure in type2 DM is very important to reduce morbidity and mortality as it shown by Reshard *et al.* (2011), the cause of elevated blood pressure in patients with diabetes is complex, involving a genetic and environmental cause. Mortality and morbidity are more in diabetes who not reach well control of blood pressure (less than 140/90 mm Hg). Large randomized controlled trials and meta-analyses of randomized controlled trials have shown that lowering hypertension will reduce rates of mortality and morbidity in type 2 diabetes mellitus [31].

According to gender distribution. The current study shows there is no significant difference between H.T and gender of patient



with D.M. In study done by Riyadh and Berq (2009), showed that there was no difference between gender of patients with Hypertension and sex of patients with D.M. and the results agree with present study [30]

In conclusion, the rate of elevated blood pressure in diabetic patient is high more than other people. So we recommend well control of blood pressure will decrease incidence of morbidity and mortality from micro and macro vascular complication.

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