

# Importance of Blood Pressure Control in Patients

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**Received date:** June 07, 2022, Manuscript No. IPJNHS-22-14177; **Editor assigned date:** June 09, 2022, PreQC No. IPJNHS-22-14177 (PQ); **Reviewed date:** June 23, 2022, QC No. IPJNHS-22-14177; **Revised date:** June 28, 2022, Manuscript No. IPJNHS-22-14177 (R); **Published date:** July 07, 2022, DOI: 10.36648/2574-2825.7.7.031

**Citation:** Alboliteeh D (2022) Importance of Blood Pressure Control in Patients. J Nurs Health Stud Vol.7 No.7:031.

## Description

Diabetes Mellitus is prevalent condition in the United States that keep growing. An estimated 30.3 million Americans have diabetes mellitus. These patients are at a much higher risk for comorbidities. The following risk factors increase the risk for complications: smoking, overweight and obesity, physical inactivity, hypertension, hyperlipidemia, and having an A1C of over 9%. In 2014, an estimated 7.2 million hospitalizations occurred for diabetic patients aged 18 years and older. 105,604 patients were hospitalized for cardiovascular disease that also have a diagnoses of diabetes mellitus (Centers for Disease Control and Prevention, 2017).

This study will emphasize the importance of blood pressure control in patients in order to reduce the risks of cardiovascular death, myocardial infarctions and strokes. Patients with type 2 diabetes mellitus that already have hypertension are at a much greater risk of developing cardiovascular complications. There is limited literature specifically regarding patients with type 2 diabetes and hypertension. The aim of this study is to combine the available information and gather new information if needed to determine an optimal blood pressure goal for patients with Type 2 DM.

## Cardiovascular Risk

The Advance Trial was conducted by the ADVANCE Collaborative group in order to determine the effects of intensive glucose control over standard glucose control along with routine blood pressure lowering strategies for both groups. The trial consisted of 11,140 patients. 5,571 were assigned to the intensive glucose control group. 5,569 were assigned to the standard glucose control group. The aim of this study was to determine if targeting an A1C of less than 6.5% would be more beneficial in reducing the risks of microvascular and macrovascular complications. The study also considered whether standard blood pressure lowering provisions added reduced risk of microvascular and macrovascular complications.

In order to meet criteria, patients had to be older than 55 years of age and have an additional risk factor for vascular complications. The patients in the intensive group were not only given gliclazide but were encouraged to lose weight and exercise, add other agents to the gliclazide as necessary, and add

insulin therapy as needed. The standard control group were treated according to local practice. The outcomes were assessed and recorded at follow up appointments every 6 months with the exception of retinopathy, albumin to creatinine ratio, mini mental scores and quality of life. Those were recorded at 2 years, 4 years and the end of the study.

Mancia and Grassi compared and contrasted the studies to determine an optimal blood pressure goal for patients. At this point in time, guidelines are not clear and concise. Certain organizations recommend 130/80 mmHg, while others recommend 140/90 mmHg. Lowering to less than 120 mmHg is not recommended as it may cause more harm than benefit. The synthesis of randomized control trials, observational studies and trial metaanalyses concludes that a systolic blood pressure reduction to 130-139 mmHg effectively reduces the risk of cardiovascular and renal complications. It is important to stress that blood pressure goals should vary from patient to patient on a case by case basis. Practitioners should also be aware that controlling blood pressure in diabetic patients may prove to be much more difficult than in normotensive patients.

## Effects of Blood Pressure Control

In a review article by Vargas-Uricoechea and Caceres-Acosta, the effects of blood pressure control and cardiovascular outcomes in type 2 diabetic patients. This study was conducted due to the fact that the information regarding blood pressure and cardiovascular effects are is limited. Due to the comorbidities that coincide with diabetes mellitus, information on patients strictly with diabetes is limited. In the past, recommended blood pressure goals have ranged from 130/80-140/90 mmHg. It was determined that there is no clear standard on an optimal level of blood pressure in diabetics and that levels should be determined on a case by case basis. It was also determined that patients with diabetes should not have a blood pressure below 130/90 mmHg due to increased risks of cardiovascular complications except in the case of patient that have a high risk of cerebrovascular events, such as patients with a history of stroke, neuropathy and proteinuria. In patients with a high risk of cerebrovascular events, blood pressure should be maintained under 130/80 mmHg.

In the article "Blood Pressure Targets in Type 2 Diabetes: Evidence against or in Favor of an Aggressive Approach" by

Giuseppe Mancia and Guido Grassi, the authors considered the optimal goal blood pressure in order to decrease the risk of cardiovascular and renal events in patients with type 2 diabetes mellitus. They gathered their evidence from randomized trials, trial meta-analyses, and large observational studies. These included: Appropriate Blood Pressure Control in Diabetes, Action to Control Cardiovascular Risk in Diabetes, Action in Diabetes and Vascular Disease, and the UK Prospective Diabetes Study.

At the end of the study, 18.1% of the intensive control group presented with major macrovascular or microvascular events,

while 20.0% of the standard control group presented with these events. There were 1,031 deaths during the trials but there were no significant differences in the amount that came from each trial group. Systolic blood pressure was greatly lowered in the individuals of the intensive control group. This study demonstrated the fact that it is possible to achieve stringent levels of glycemic control with conventional agents.