



Ardabil University of medical sciences
Faculty of pharmacy

A dissertation submitted for Pharm D degree

Entitled:

Effect of pentoxifylline and captopril combination therapy versus captopril monotherapy on blood pressure control in patients with hypertension at Tabriz Shahid Madani Hospital: A pilot randomized clinical trial

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By:

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September 2019

Thesis No. D10-6/98

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Dedication

This dissertation is dedicated to:

My brilliant and loving parents Nayyer & Taghi

*Whose prays, love, encouragement, and great support make me
able to get such success. Thank you for giving me the life I love
today.*

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Abstract

Purpose Hypertension has received too much attention because of its high prevalence, its association with concomitant risk factors and mortality. Considering the pathophysiology of hypertension and the key role of blood viscosity (BV) in the regulation of blood pressure (BP), and also hemorheological effects and cardiovascular benefits of pentoxifylline (PTX), this study was conducted to evaluate whether PTX can reduce BP when added to captopril in patients with stage 1 hypertension.

Methods In this pilot randomized clinical trial 62 patients at the age of 18 to 80, with diagnosis of stage 1 hypertension were entered. The intervention group (n=30) received 1200 mg PTX in three divided doses plus 25 mg captopril three times a day whereas, the control group (n=32) received only 75 mg captopril in three divided doses. Measurements of BP were done according to American Heart Association (AHA) guidelines at baseline, first and second month of the study period. Major adverse cardiac events (MACEs) during this period were recorded as secondary end points of the study.

Results Comparing the systolic blood pressure (SBP) levels in the groups of intervention and control no significant differences were noted at baseline (150.4 ± 6.03 vs. 150.4 ± 6.2 , $p=0.98$), first (138.4 ± 9.4 vs. 142.3 ± 5.6 , $p=0.08$) and second (134.6 ± 8.9 vs. 137.4 ± 6.0 , $P=0.20$) months of the study respectively. Similarly, no significant differences were observed in the diastolic blood pressure (DBP) at baseline (91.7 ± 3.9 vs. 92.0 ± 3.7 , $p=0.84$), first (85.5 ± 5.1 vs. 86.9 ± 3.8 , $p=0.27$) and second (82.6 ± 5.7 vs. 84.0 ± 3.5 , $p=0.31$) months. About baseline demographic data of patients, no significant differences were observed between the two groups.

Discussion and Conclusions Based on the results of present study, adding PTX as a hemorheological agent to captopril could not significantly reduce blood pressure in the patients with stage 1 hypertension. Our findings are in accordance with previous studies however, they were not well designed for measuring BP. Further larger-scale studies are needed to confirm these findings.

Keywords Blood pressure, Primary hypertension, Stage 1 hypertension, pentoxifylline, captopril, Major adverse cardiac events

Table of Contents

| | |
|--|-----------|
| Chapter 1 Introduction | 1 |
| 1.1 Introduction | 2 |
| 1.2 Objectives | 3 |
| 1.2.1 General objective: | 3 |
| 1.2.2 Specific Objectives: | 3 |
| 1.2.3 Applicative Objectives: | 3 |
| 1.3 Hypothesis or Questions: | 3 |
| 1.4 Literature Reviews | 4 |
| 1.4.1 Epidemiology of hypertension | 4 |
| 1.4.2 Definition of primary hypertension | 4 |
| 1.4.3 Classification of blood pressure | 5 |
| 1.4.4 Known etiological factors in essential hypertension..... | 7 |
| 1.4.4.1 Cardiac output and peripheral resistance..... | 7 |
| 1.4.4.2 Renin-angiotensin system | 7 |
| 1.4.4.3 Autonomic nervous system | 8 |
| 1.4.4.4 Endothelial dysfunction | 8 |
| 1.4.4.5 Genetics | 8 |
| 1.4.5 Pathologic changes due to hypertension..... | 9 |
| 1.4.5.1 Cardiac changes..... | 9 |
| 1.4.5.2 Brain | 10 |
| 1.4.5.3 Vessels | 10 |
| 1.4.5.4 Kidney..... | 10 |
| 1.4.5.5 Eye | 11 |
| 1.4.6 Benefits in controlling hypertension..... | 11 |
| 1.4.7 Hypertension management | 12 |
| 1.4.7.1 Non-pharmacologic | 12 |
| 1.4.7.2 Pharmacologic | 12 |
| 1.4.8 Pentoxifylline | 14 |
| 1.4.8.1 Pharmacodynamics | 14 |
| 1.4.8.2 Pharmacokinetics | 17 |
| 1.4.8.3 Cardiovascular benefits of pentoxifylline..... | 18 |
| Chapter 2 Methods..... | 21 |
| 2.1 Study design and setting | 22 |
| 2.2 Study Ethics | 22 |

| | |
|--|-----------|
| 2.3 Study population | 23 |
| 2.4 Patients' information form..... | 23 |
| 2.5 Randomization and study process | 24 |
| 2.6 Study End Points and blood pressure measurements..... | 24 |
| 2.7 Compliance with treatment | 25 |
| 2.8 Statistical analysis | 25 |
| 2.9 Study power calculation (determining the sample size) | 25 |
| Chapter 3 Results | 26 |
| 3.1 Demographic data of patients | 27 |
| 3.2 Patients' blood pressure | 32 |
| Chapter 4 Discussion and Conclusion | 38 |
| 4.1 Discussion..... | 39 |
| 4.2 Conclusion..... | 45 |
| 4.3 Limitations | 46 |
| 4.4 Acknowledgments | 46 |
| 4.5 Conflict of interest..... | 46 |
| 4.6 Funding | 46 |
| References..... | 47 |

List of tables

| | |
|---|-----------|
| Table 1.1 Classification of blood pressure according to JNC 7 report..... | 6 |
| Table 1.2 classification of blood pressure according to ESH/ESC guidelines..... | 6 |
| Table 3.1 Baseline demographic and clinical data of under study patient..... | 28 |
| Table 3.2 The mean blood pressure of patients at baseline, 1 and 2 months after study..... | 32 |
| Table 3.3 Observed adverse reactions in the pentoxifylline group..... | 32 |

List of figures

| | |
|---|-----------|
| Fig. 1.1 The role of pentoxifylline in cardiovascular disease..... | 19 |
| Fig 3.1 CONSORT Flow diagram of the study..... | 27 |
| Fig. 3.2 The patients' age in both groups..... | 29 |
| Fig. 3.3 The patients' gender in both groups..... | 30 |
| Fig. 3.4 The Mean systolic blood pressure during the study period..... | 33 |
| Fig. 3.5 The Mean diastolic blood pressure during the study period..... | 34 |
| Fig. 3.6 The trend of changes of systolic blood pressure during the study period..... | 35 |
| Fig. 3.7 The trend of changes of diastolic blood pressure during the study period..... | 36 |

Abbreviations:

ACE: Angiotensin Converting Enzyme

ANS: Autonomic Nervous System

ARB: Angiotensin II Receptor Blockers

BP: Blood Pressure

BV: Blood Viscosity

cAMP: cyclic Adenosine Mono Phosphate

CCBs: Calcium Channel Blockers

CHD: Coronary Heart Disease

Chl: Cholesterol

CKD: Chronic Kidney Disease

CVD: Cardio Vascular Disease

CO: Cardiac Output

DBP: Diastolic Blood Pressure

GFR: Glomerular Filtration Rate

FBS: Fasting Blood Sugar

HDL: High Density Lipoprotein

Hgb: Hemoglobin

LDL: Low Density Lipoprotein

LVH: Left Ventricular Hypertrophy

PDE: Phosphodiesterase

PTX: Pentoxifylline

PVR: Peripheral Vascular Resistance

RAS: Renin-Angiotensin System

RBC: Red Blood Cell

SBP: Systolic Blood Pressure

sCr: serum Creatinine

SVD: Small Vessel Disease

TG: Triglyceride

TNF- α : Tumor Necrosis Factor alpha

TPR: Total Peripheral Resistance