بسم الله الرحمن الرحيم

Multifactorial prevention program for cardiovascular disease in primary care: hypertension status and effect on mortality

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ارائه دهنده: فاطمه خطیب (دستیار تخصصی پزشکی اجتماعی)

- INTRODUCTION
- MATERIALS AND METHODS
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- DISCUSSION
- SUMMARY

INTRODUCTION

- Importance of Hypertension

- Morbidity and Mortality

- Increasing prevalence

  - Population growth

  - Ageing

  - Behavioral factors

    - Unhealthy diet

    - Harmful alcohol consumption

    - Physical inactivity

    - Excess weigh

INTRODUCTION

- Easy Diagnosis
- Medications
- Importance early detection
- This Study
  - Prospective cohort study

MATERIALS AND METHODS

- Subjects
  - Men and women aged 45–70 years.
  - previously diagnosed CVD or diabetes were excluded.
  - were performed from August 2005 to September 2007.
  - The study procedures and inclusion criteria:
    - WC ≥ 80 cm in women and ≥94 cm in men.
    - BP ≥ 140/90 mmHg.
    - History of **gestational diabetes** or **hypertension**, and history of **coronary heart disease**, **myocardial infarction**, or **stroke** of their parents or siblings.

MATERIALS AND METHODS

- Appointment with the study nurse
    - Completing questionnaire
    - Physical examination
    - Lifestyle counselling
    - **Highrisk** subjects: were offered to have an appointment with the general practitioner (GP) of the project.
    - N= 2659

MATERIALS AND METHODS

- Measurements
    - BP
    - BMI
    - METS

- Laboratory tests
    - Total cholesterol, HDL-C and triglycerides
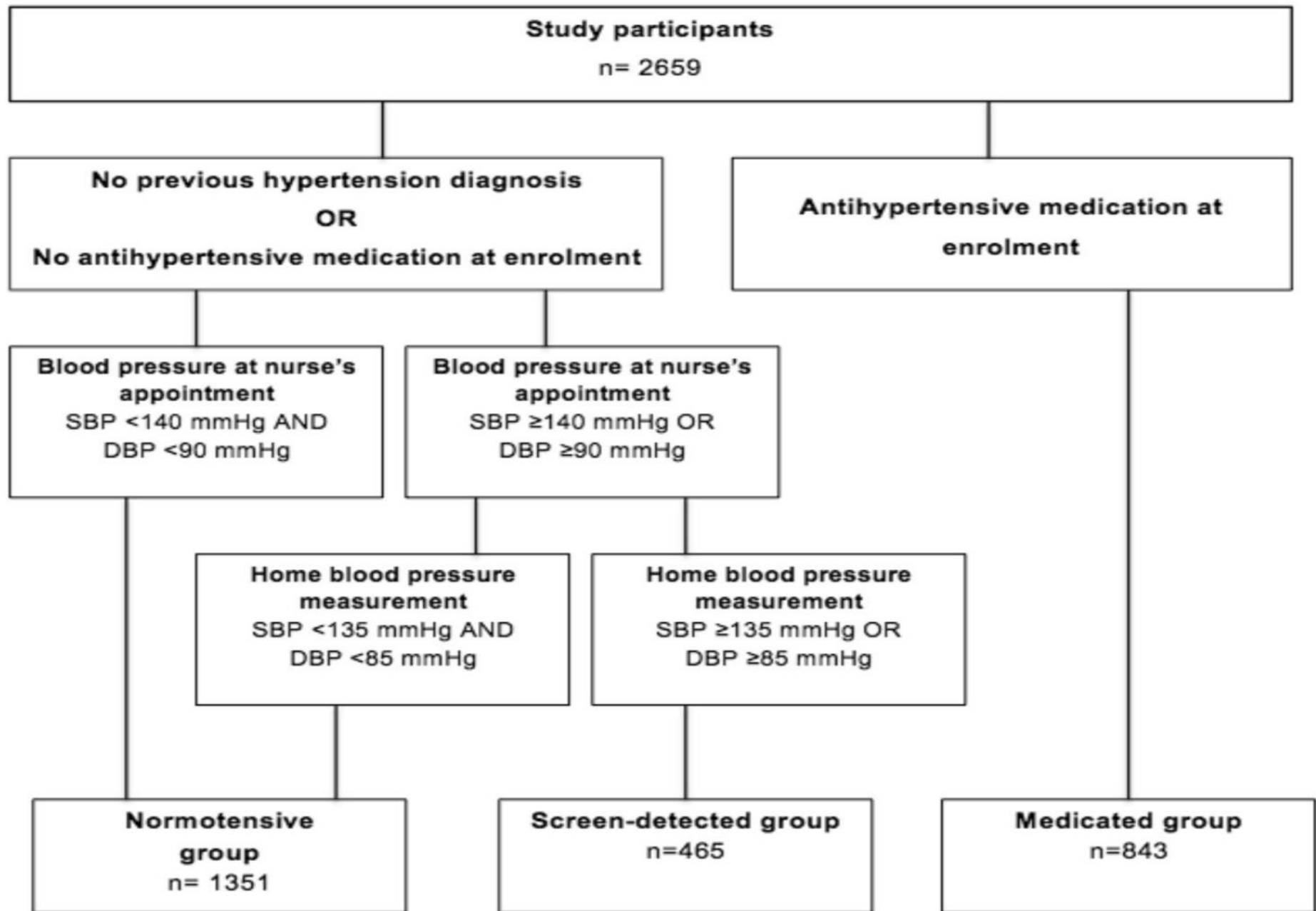   - Fasting plasma glucose
    - OGTT

MATERIALS AND METHODS

- Appointment with the general practitioner
  - 2–4 months after the nurse's appointment.
  - Physical examination
  - Lifestyle counselling
  - Antihypertensive medication was prescribed if systolic BP was ≥160 mmHg or diastolic ≥100 mmHg.

- Definitions and formation of study groups
  - Fig. 1 Formation of study groups.

Study participants
n= 2659

No previous hypertension diagnosis
OR
No antihypertensive medication at enrolment

Antihypertensive medication at enrolment

Blood pressure at nurse's appointment
SBP <140 mmHg AND
DBP <90 mmHg

Blood pressure at nurse's appointment
SBP ≥140 mmHg OR
DBP ≥90 mmHg

Home blood pressure measurement
SBP <135 mmHg AND
DBP <85 mmHg

Home blood pressure measurement
SBP ≥135 mmHg OR
DBP ≥85 mmHg

Normotensive group
n= 1351

Screen-detected group
n=465

Medicated group
n=843

MATERIALS AND METHODS

- Definitions and formation of study groups
  - study groups
  - Glucose metabolism disorders
    - Diabetes
    - Prediabetes
  - LTPA level
    - Low
    - Moderate
    - high

MATERIALS AND METHODS

- Mortality
  - Data was obtained from Statistics Finland.
  - Deaths from:
    - All causes
    - Cardiovascular causes

- Statistical analyses

RESULTS

- N=2659 (55% women)
- The mean age = 58 years (SD 7)
- Subjects
  - Normotensives: 1351 (51%)
  - screendetected hypertensives: 465 (17%)
  - medicated hypertensives: 843 (32%)
- Table 1: Baseline characteristics of the study participants

Table 1. Baseline characteristics of the study participants.

	Hypertension status			P value[a] [multiple comparison]
	Normotensive N = 1351	Screen-detected N = 465	Medicated N = 843	
Age, mean, years (SD)	57 (7)	58 (7)	60 (7)	<0.001 [N/S, N/M, S/M]
Females, n (%)	786 (58)	228 (49)	461 (55)	0.002 [N/S]
Education years, mean (SD)	10.7 (2.7)	10.3 (2.6)	9.9 (2.6)	<0.001 [N/S, N/M, S/M]
Body mass index, kg/m², mean (SD)	27.5 (4.4)	28.7 (4.6)	31.0 (5.5)	<0.001 [N/S, N/M, S/M]
Waist circumference, cm, mean (SD)				
Women	88 (12)	92 (13)	98 (14)	<0.001 [N/S, N/M, S/M]
Men	99 (10)	101 (10)	106 (12)	<0.001 [N/S, N/M, S/M]
Current smoking, n (%)	247 (19)	86 (19)	130 (15)	0.14
AUDIT-score, mean (SD)	4.5 (4.7)	5.2 (5.3)	4.5 (4.9)	0.021 [N/S, N/M, S/M]
Leisure-time physical activity level, n (%)				0.015 [N/S, S/M]
Low	211 (16.1)	85 (18.8)	172 (21.0)	
Moderate	660 (50.4)	226 (49.9)	408 (49.8)	
High	438 (33.5)	142 (31.3)	240 (29.3)	
Blood pressure, mmHg, mean (SD)				
Systolic	132 (15)	157 (16)	144 (18)	<0.001 [N/S, N/M, S/M]
Diastolic	81 (8)	92 (10)	86 (10)	<0.001 [N/S, N/M, S/M]
Plasma lipids, mmol/l, mean (SD)				
Total cholesterol	5.41 (0.93)	5.53 (0.97)	5.27 (1.03)	<0.001 [N/S, N/M, S/M]
HDL cholesterol	1.61 (0.47)	1.56 (0.42)	1.44 (0.40)	<0.001 [N/S, N/M, S/M]
LDL cholesterol	3.26 (0.86)	3.35 (0.87)	3.15 (0.93)	<0.001 [N/M, S/M]
Triglycerides	1.29 (0.72)	1.42 (0.84)	1.54 (0.71)	<0.001 [N/S, N/M, S/M]
Plasma glucose, mmol/l, mean (SD)				
Fasting	5.50 (1.09)	5.59 (1.05)	5.84 (1.28)	<0.001 [N/M, S/M]
2h-glucose	6.92 (1.94)	7.47 (2.25)	8.20 (2.53)	<0.001 [N/S, N/M, S/M]
Glucose disorder, n (%)				<0.001 [N/S, N/M, S/M]
Prediabetes	151 (11)	68 (15)	161 (19)	
Type 2 diabetes	75 (6)	34 (7)	115 (14)	
Lipid-lowering medication, n (%)	72 (5)	36 (8)	227 (27)	<0.001 [N/M, S/M]

Mortality

- 31,710 person-years were followedup (median time 12.3 years).

- There were **289** (11%) deaths, **83** (29%) due to CVD.

- Unadjusted cumulative all-cause mortality over 13 years:

  - Normotensive: **9.1**% (95% CI: 7.6 to 10.8)

  - screen-detected: **9.9**% (95% CI: 7.4 to 13.1)

  - medicated group: **16.0**% (95% CI: 13.6 to 18.8)

- Unadjusted cumulative CVD mortality over 13 years:

  - Normotensive: **2.5**% (95% CI: 1.8 to 3.5)

  - screen-detected: **1.8**% (95% CI: 1.0 to 3.5)

  - medicated group: **5.5**% (95% CI: 4.1 to 7.3)

- Adjusted cumulative all-cause and CVD mortality:

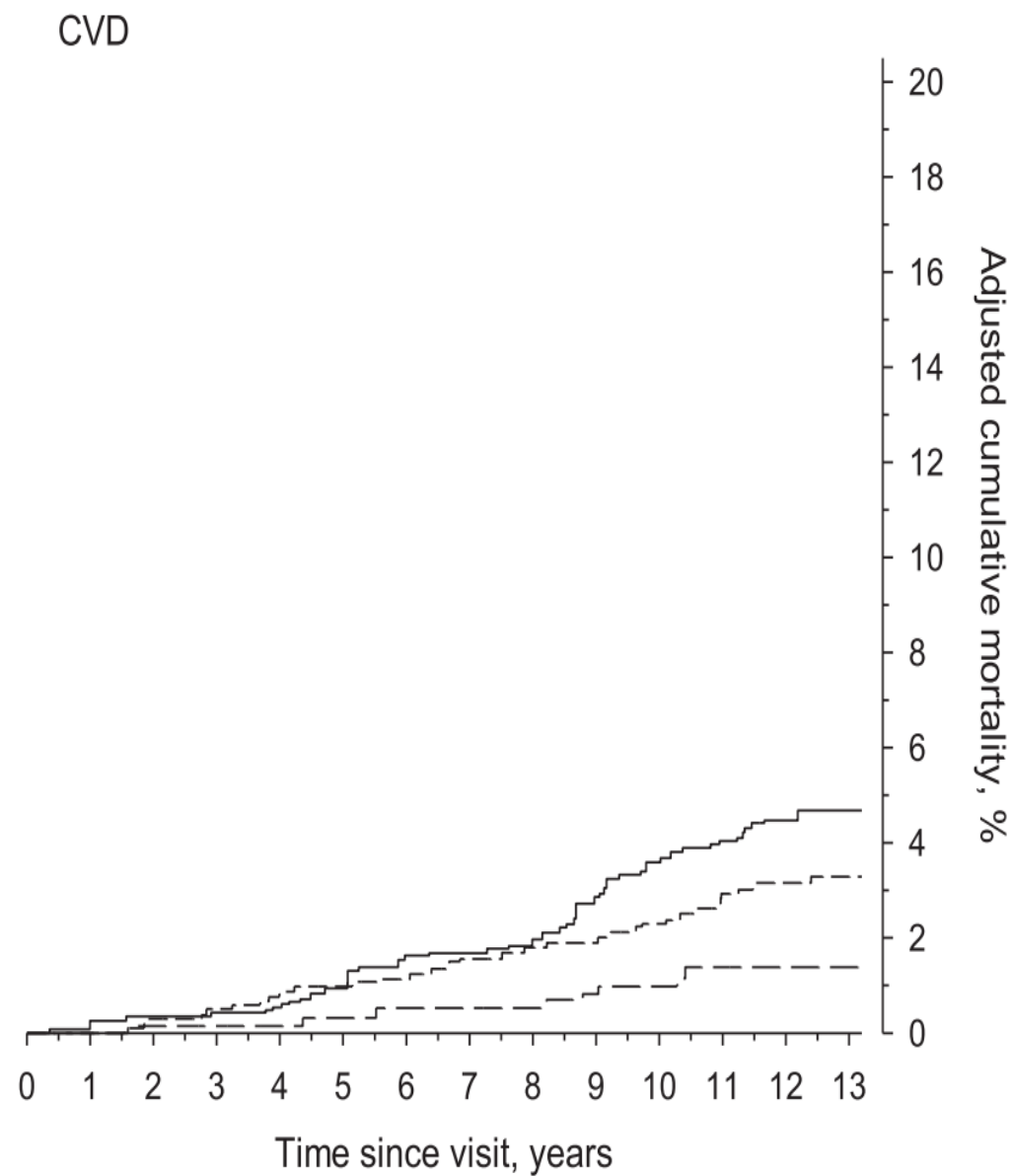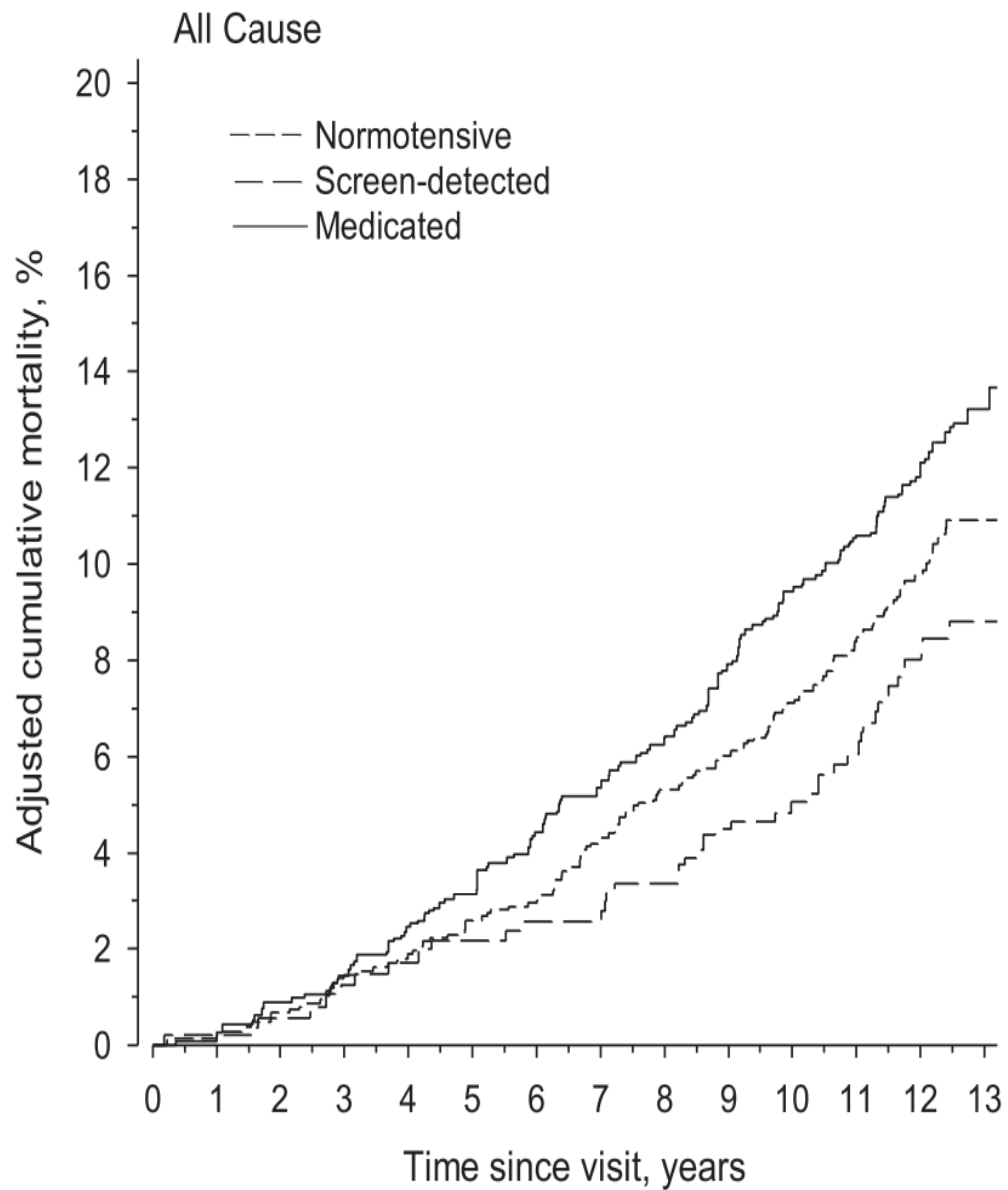 - Fig. 2 AND Table 2

All Cause

CVD

Table 2. Competing risk regression (Fine and Gray hazards model) for the relationship between cardiovascular disease (CVD) risk factors and CVD mortality.

	CVD mortality	
	sHR[a] (95%CI)	*p* value
Hypertension status		
Medicated	1.00 (Reference)	
Normotensive	0.77 (0.45 to 1.31)	0.33
Screen-detected	0.40 (0.19 to 0.88)	0.023
Age	1.12 (1.07 to 1.17)	<0.001
Male gender	2.57 (1.60 to 4.11)	<0.001
Body mass index	1.00 (0.95 to 1.05)	0.95
Total cholesterol	0.97 (0.73 to 1.29)	0.84
Newly diagnosed diabetes	2.71 (1.57 to 4.69)	<0.001
Education years	0.95 (0.86 to 1.06)	0.38
Smoking	1.81 (1.08 to 3.03)	0.025
Leisure-time physical activity level		
Low	1.00 (Reference)	*P* for linearity = 0.75
Moderate	1.04 (0.56 to 1.92)	
High	1.11 (0.57 to 2.13)	

[a]Subhazard ratio, competing-risks regression model was used where the rest of the causes of death were considered as competing risks.

DISCUSSION

- This study
- Previous studies
  - Low levels of awareness (up to 50%) and inadequate control of hypertension.
  - Prevalence of hypertension is estimated to be over 50% in the adult population.
  - Residual cardiovascular risk in BP-medicated individuals.
  - The impact of newly diagnosed T2D was surprisingly high.
  - without multifactorial intervention, the prognosis of newly diagnosed hypertensives has been worse than in normotensive subjects.
  - A higher risk of all-cause and CVD mortality than normotensive individuals.

DISCUSSION

- The **limitation** of the present study

- **Strengths** of the present study

- **Targeted screening, lifestyle counseling**, and **prescription** of evidence-based medication were associated with long-term CVD mortality risk.

- This study emphasizes the **importance of early detection of hypertension** and **multifactorial intervention** in a CVD-risk population

SUMMARY

What is known about topic

- Hhypertension remains commonly **undetected** and **undermedicated.**

- Both **high-risk** and **population-based strategies** have been recommended to improve hypertension management.

- Evidence about the effectiveness of screening strategies for reducing hypertension-related morbidity and mortality is **scarce**.

SUMMARY

What this study adds

- Screening for hypertension with home blood pressure monitoring is **quite easy** in primary care setting

- *Timely multifactorial intervention* seems to be **effective** in preventing hypertension-related mortality

با تشکر از توجه شما