Cardiovascular and all-cause mortality among normotensive and hypertensive Finnish adults from 1972-2001

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Background (I)

- Elevated blood pressure is an independent and strong predictor for cardiovascular disease
- Benefit of antihypertensive treatments in reducing the risk for cardiovascular events in persons with high blood pressure has been well established

Background (II)

- Only a few epidemiological studies have been conducted investigating the possible long-term benefit of hypertension control with regard to cardiovascular disease (CVD) or all-cause mortality
- Controversial results have been published regarding health outcomes comparing treated and untreated hypertensive persons
- Studies including women are scant

Aim

To investigate whether there are differences in CVD and all-cause mortality among subgroups of hypertensive subjects by awareness and blood pressure (BP) control independent of other CVD factors

Study population

- Six independent cross-sectional surveys at five-year intervals within the framework of the North Karelia, FINMONICA/Finrisk studies (1972, 1977, 1982, 1987, 1992 and 1997)

- Independent random sample from the national population register, stratified by sex and 10-year age categories according WHO MONICA protocol

- Participation rates:
  - Men: 71-94%
  - Women: 78-95%

Definition of hypertension

- Systolic blood pressure at least 140 mmHg systolic or 90 mmHg diastolic or
- Report to have taken antihypertensive drugs during the preceding 7 days

Hypertension groups

- Normotensive subjects
- Hypertensive patients treated with antihypertensive drugs
- Aware, but untreated hypertensive subjects
- Unaware, untreated hypertensive subjects

Assessment of other variables at baseline

- Self-administered questionnaire about socio-economic and psychosocial factors, medical history and health behavior
- BMI (height, weight), diabetes
- Smoking and alcohol intake
- Physical activity
- Serum cholesterol
- Education

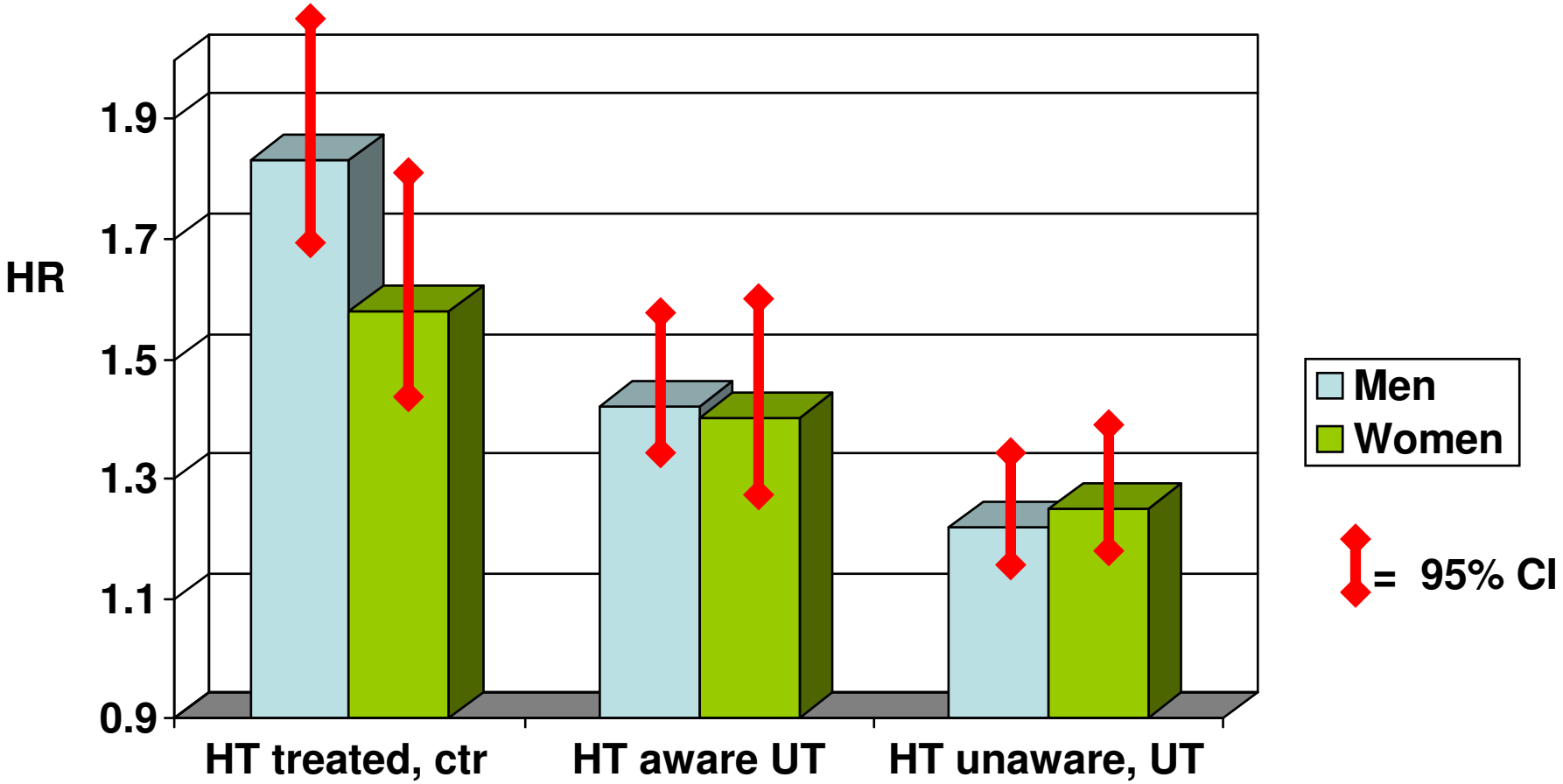
Exclusion criteria

- Subjects who were previously diagnosed with coronary heart disease (n = 2113), stroke (n = 380), heart failure (n = 1624) or cancer (n = 132) at baseline
- Subjects with incomplete data (n=4144)

End point

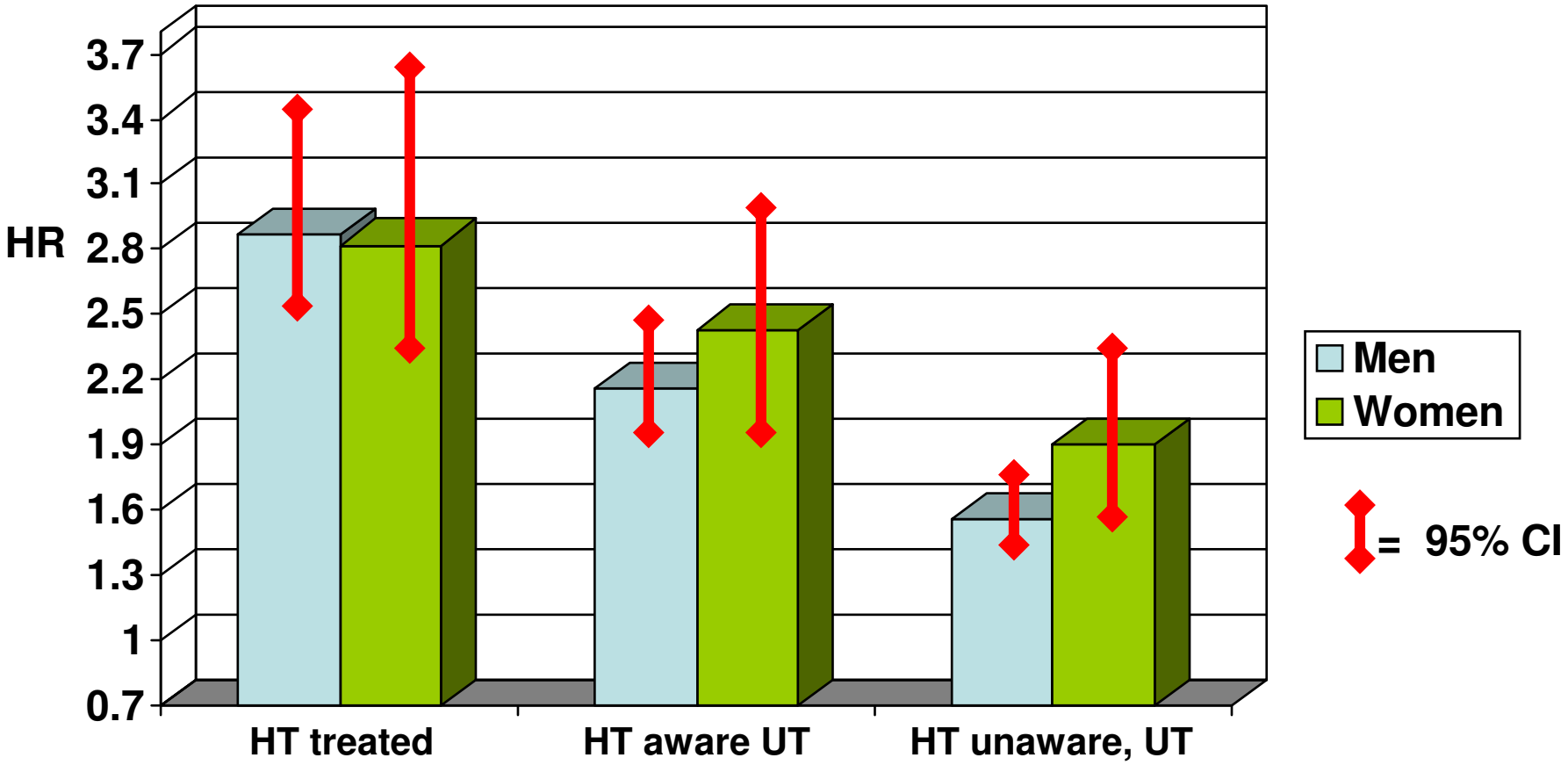
- End point of the follow-up:
  - Case of death
  - December 2001
- Final sample: 20 358 men and 21 537 women
- Median follow-up period 20 years (13-25 years)
- 3615 cases of death in men (56% due to CVD)
- 2012 cases of death in women (40% due to CVD)

Risk for all-cause mortality[1] among men and women according to HT subgroups



[1]adjusted for age, area, year of survey, education, diabetes, smoking, cholesterol, body mass index, leisure time, occupational and commuting physical activity

Risk for CVD mortality[1] among men and women according to HT subgroups



[1]adjusted for age, area, year of survey, education, diabetes, smoking, cholesterol, body mass index, leisure time, occupational and commuting physical activity

All-cause mortality between treated, hypertensive controlled and uncontrolled men and women

	Men		Women	
	RR	**95% CI**	**RR**	**95% CI**
Hypertensive, treated, controlled	1.0	(ref.)	1.0	(ref.)
Hypertensive, treated, uncontrolled[1]	2.11	(1.27-3.50)	1.49	(0.88-2.53)

[1]adjusted for age, area, year of survey, education, diabetes, smoking, cholesterol, body mass index, leisure time, occupational and commuting physical activity

CVD mortality between treated, hypertensive controlled and uncontrolled men and women

	Men		Women	
	RR	**95% CI**	**RR**	**95% CI**
Hypertensive, treated, controlled	1.0	(ref.)	1.0	(ref.)
Hypertensive, treated, uncontrolled[1]	2.56	(1.25-5.24)	1.57	(0.72-3.40)

[1]adjusted for age, area, year of survey, education, diabetes, smoking, cholesterol, body mass index, leisure time, occupational and commuting physical activity

Conclusions (I)

1. All of hypertensive patients had a higher risk of all-cause and CVD mortality than normotensive people
2. Despite modern antihypertensive therapy treated hypertensive patients are still far from the optimal treatment level to protect their cardiovascular health

Conclusions (II)

3. Men treated and controlled for hypertension had lower all-cause and CVD mortality than treated, uncontrolled men
   - Treatment of hypertension in men may start earlier
   - Treatment in men may be more aggressive

Research team

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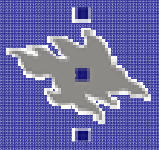

Thank you