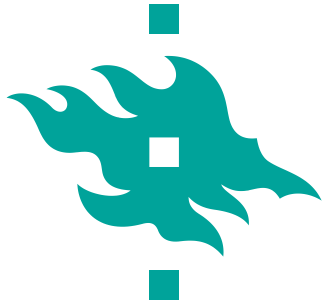


Blood Pressure levels in acute ICH Associated with Mortality in the Young

Kongressal II THURSDAY, 24 AUGUST 2017 - 09:30 - 10:00



Satu Mustanoja, MD, PhD, MSc (Stroke Medicine)
Helsinki University Hospital,
Department of Neurology, Stroke Unit
Finland



UNIVERSITY OF HELSINKI
FACULTY OF MEDICINE



ICH Intracerebral hemorrhage

- High morbidity and mortality
- Incidence and case fatality increases with age
- Pathophysiologic mechanisms are ambiguous
- Risk for early neurological deterioration
 - Hematoma growth mainly occurs within the first hours
- Few effective therapeutic mechanisms
 - Need for aggressive early management in stroke unit

ICH and elevated Blood Pressure

- SBP \geq 140mmHg is found in most acute ICH patients
 - associated with hematoma expansion, neurological deterioration, death and dependency
- Acute lowering of SBP to 140 mmHg
 - is considered safe, can be effective for improving outcome
- Optimum BP levels in the acute phase are not defined
 - guidelines vary

Young ICH patients

- Less cardiovascular risk factors
 - Less hypertensive ICH
 - More structural ICH
- Prevalence of hypertension has doubled in the young in the last decades

Helsinki ICH Young Study

Methods

- Consecutive first-ever, non-traumatic ICH patients ≤ 50 years of age
- Admission and 24-hour BP values vs. outcome
 - SBP, DBP, PP (SBP-DBP), MAP, delta (admission–24 hour) BP
- The outcome measures were 3-month and long-term mortalities
 - Adjusted for demographics and well-known ICH predictors
 - Cox regression models to assess independent BP association with mortality

Baseline characteristics in Age percentiles

Parameters	Age Groups, year range (n)				<i>P</i>
	17-35 (84)	36-43 (75)	44-47 (65)	48-50 (71)	
Hypertension	12 (14)	25 (33)	23 (35)	35 (49)	<0.001
Antihypertensive	5 (6.0)	12 (16)	8 (12)	19 (27)	0.003
Antithrombotics	4 (4.8)	6 (8.0)	3 (4.6)	15 (21)	0.008
BP, admission					
SBP, mmHg	147 (130-161)	153 (135-182)	164 (131-191)	168 (142-190)	0.001
DBP, mmHg	83 (74-98)	94 (82-110)	89 (77-111)	99 (83-111)	0.001
ICH etiology					
Hypertensive	12 (4.1)	25 (8.5)	23 (7.8)	35 (12)	
Structural	39 (13)	18 (6.1)	10 (3.4)	12 (4.1)	<0.001

Helsinki ICH Young Study

Results (n=334)

- 28% (n=92) hypertension
- 17% (n=54) used hypertensive treatment
- 17 years (9.65-14.7 years) follow-up
- Mortality
 - 17% (n=56) 3-month
 - 29% (n=97) long-term follow-up
 - was associated with higher admission BP levels, not 24-h BP

Helsinki ICH Young Study

Results (n=334)

- SBP \geq 160 mmHg (47%; n=156)
 - died more often (18% vs. 11%; $P=0.001$)
 - died earlier (9.6 [2.9-12.9] vs. 11.3 [8.1-13.9] years; $P=0.001$)
 - was independently associated with mortality
 - 3-month (HR 2.50 [95% CI 1.19-5.24]; $P<0.05$)
 - long-term (1.76 [1.03-3.01]; $P<0.05$)
 - when adjusted to age, GCS, ICH volume, IVH or infratentorial location

Admission BP and Mortality

BP	All (n=336)	Mortality		<i>P</i>	Longterm		<i>P</i>
		3-month No (n=278)	Yes (n=56)		No (n=237)	Yes (n=97)	
Baseline							
SBP	155 (135-182)	152 (132-181)	172 (147-195)	0.007	150 (131-181)	165 (146-188)	0.012
DBP	92 (79-109)	91 (78-107)	97 (83-113)	0.046	90 (77-107)	95 (83-110)	0.029
PP	65 (32)	63 (30)	74 (27)	0.023	62 (31)	70 (32)	0.050
MAP	113 (33)	111 (32)	121 (32)	0.016	110 (32)	120 (30)	0.017

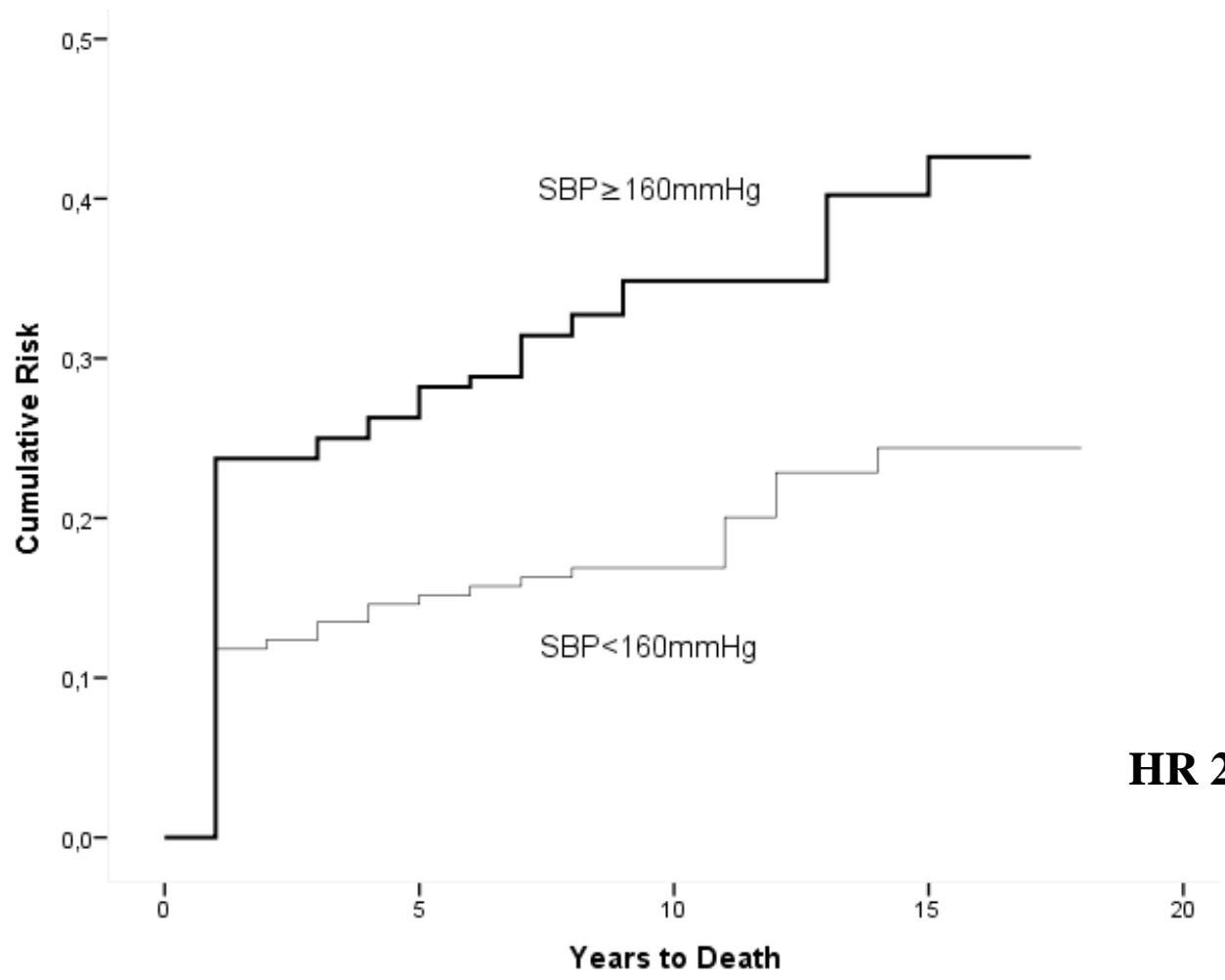
BP and 3-month mortality, Cox regression

Predictors	HR (95% CI)	P
Age	1.01 (0.96-1.06)	0.737
Gender	1.25 (0.60-2.62)	0.553
GCS	0.78 (0.73-0.84)	<0.001
ICH volume	1.01 (0.99-1.02)	0.076
Infratentorial ICH	2.70 (0.95-7.73)	0.064
IVH	1.38 (0.63-3.04)	0.425
SBP \geq 160mmHg	2.50 (1.19-5.24)	0.016
DBP \geq 90mmHg	1.69 (0.81-3.51)	0.157
PP \geq 70	1.27 (0.62-2.61)	0.516
MAP \geq 115	1.72 (0.84-3.52)	0.140

BP and long-term mortality, Cox regression

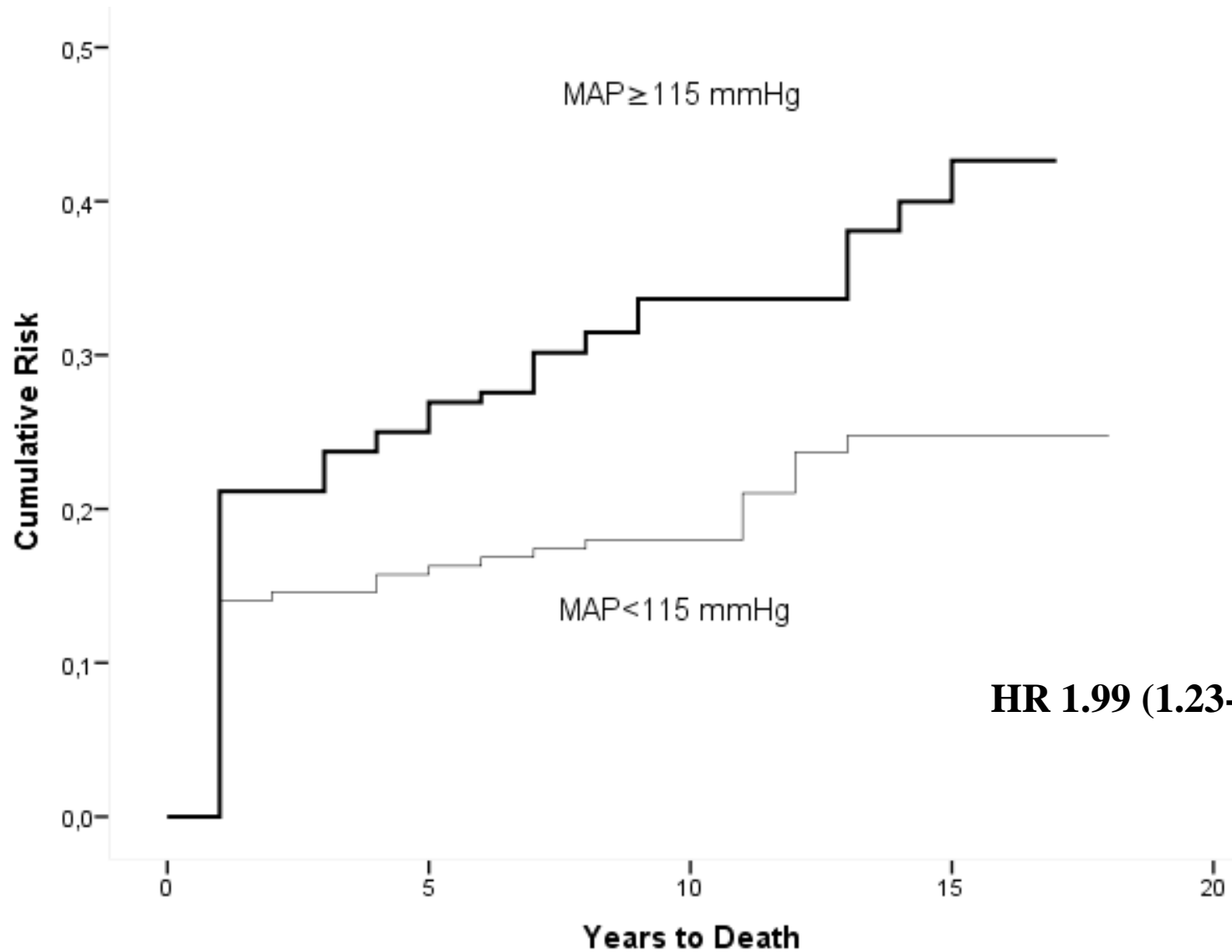
Predictors	HR (95% CI)	P
Age	1.01 (0.98-1.05)	0.482
Gender	1.44 (0.93-2.50)	0.198
GCS	0.85 (0.80-0.90)	<0.001
ICH volume	1.01 (0.99-1.01)	0.156
Infratentorial ICH	2.38 (0.97-5.82)	0.058
IVH	1.35 (0.74-2.50)	0.333
SBP \geq 160mmHg	1.76 (1.03-3.01)	0.040
DBP \geq 90mmHg	1.46 (0.85-2.52)	0.171
PP \geq 70	1.20 (0.69-2.09)	0.516
MAP \geq 115	1.79 (1.04-3.07)	0.034

Cumulative event risk of SBP below or ≥ 160 mmHg at follow-up



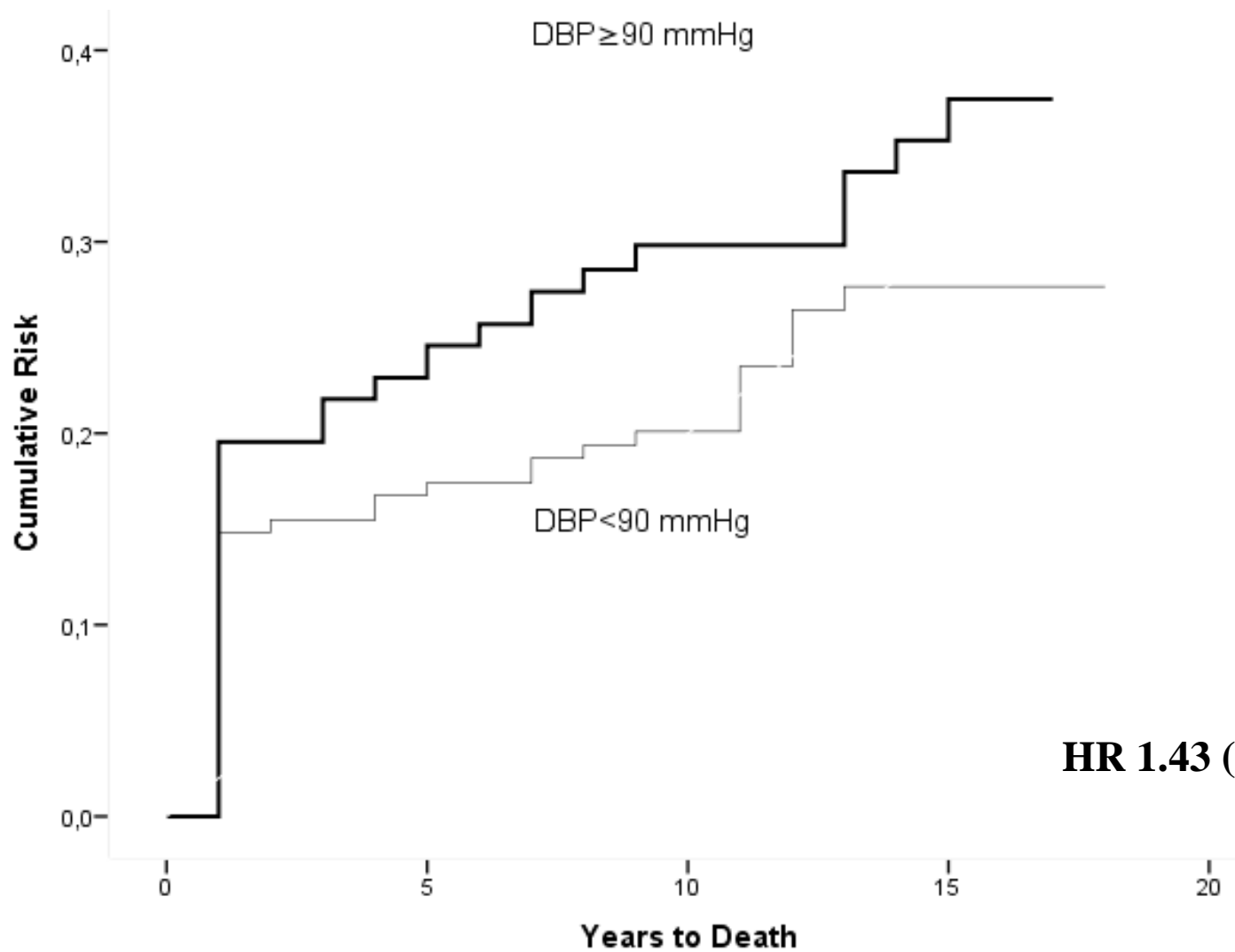
HR 2.24 (1.38-3.63), $P=0.001$

Cumulative event risk of MAP ≥ 115 mmHg



HR 1.99 (1.23-3.21), $P=0.005$

Cumulative event risk of DBP ≥ 90 mmHg



HR 1.43 (0.88-2.30), $P > 0.05$

Conclusions

- Admission BP levels were increased in 70%
 - As in older ICH populations
 - Hypertension, hypertensive ICH and BP levels increased significantly with age
- Age was associated with stroke severity and ICH volume
 - Independently associated with ICH volume and BP
- SBP levels ≥ 160 mmHg independently associated with mortality
 - Both at short- and long-term follow-up

Conclusions

- Important to control BP levels within the first-day
 - Long-term ICH prevention
 - Reduces ICH morbidity and mortality
 - Lowering BP seems safe, as 24-hour BP levels were not associated with either short- or longterm mortality
- In the young, GCS, SBP and MAP independently predicted long-term mortality

Thank You!