Journal Reading

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Corticosteroid after etomidate in critically ill patients: A randomized controlled trial

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Background

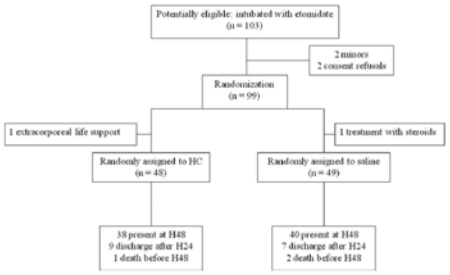
- Etomidate是目前針對血型動力學不穩定病人插管麻醉的第一線藥物。
  - 優點: 心血管、呼吸影響小，可降低腦壓及腦部代謝率。
  - 缺點: 阻斷cortisol的合成，造成primary adrenal insufficiency。
- 造成primary adrenal insufficiency可能與ICU病人的mortality and morbidity有關。

Objective

- 探討在etomidate-related adrenal insufficiency其間，給予血行動力不穩定的病人moderate-dose hydrocortisone(200-300 mg/day)期效果如何。

Method

- Prospective, randomized, controlled, double-blind (caregiver, investigator) trial
- July 2008 and July 2010
- University Hospital of Grenoble and included three ICUs



Result

Characteristics and physiological data collected at the time of etomidate administration (H0)

	Control (n = 49)	Hydrocortisone (n = 48)
Age, yrs	45 (33–59)	52 (34–63)
Male sex, no.	32 (65%)	31 (65%)
Weight, kg	75 (65–80)	70 (65–79)
Patients with body mass index >30, kg/m²	9 (18%)	8 (17%)
Patient history, no.		
Hypertension	10 (20%)	13 (27%)
Coronary artery disease	5 (10%)	6 (13%)
Congestive heart failure	2 (4%)	2 (4%)
Diabetes	6 (12%)	8 (17%)
Reasons for endotracheal intubation, no.		
Isolated severe traumatic brain injury	7 (14%)	11 (23%)
Subarachnoid hemorrhage	5 (10%)	5 (10%)
Multiple trauma	24 (49%)	18 (37%)
Acute poisoning	5 (10%)	7 (15%)
Sepsis with no shock	1 (2%)	2 (4%)
Others	7 (14%)	5 (10%)
Disease severity before intubation, no.		
Glasgow Coma Scale score	12 (7–15)	9 (6–14)
Heart rate, beats/min	89 (74–103)	89 (75–110)
Systolic blood pressure, mm Hg	120 (105–136)	114 (101–130)
Temperature, °C[a]	36.5 (35.7–36.9)	36.5 (35.5–37.0)
Cardiovascular Sequential Organ Failure Assessment	0 (0–1)	0 (0–1)
Etomidate dose, mg/kg	0.33 (0.25–0.46)	0.32 (0.29–0.42)
Simplified Acute Physiology Score II	42 (32–51)	45 (34–54)
Injury Severity Score[b]	27 (21–34)	25 (16–29)

Result

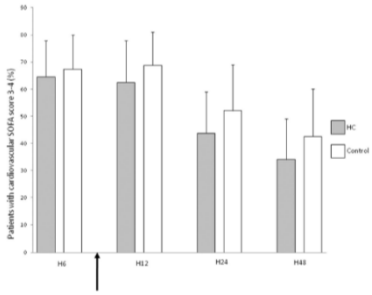
Baseline clinical and biological characteristics from 97 study patients collected at H6

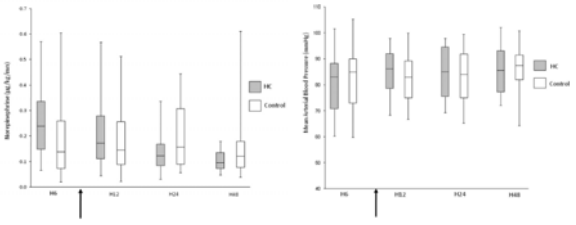
	Control (n = 49)	Hydrocortisone (n = 48)
Systolic blood pressure, mm Hg	119 (103–131)	120 (101–137)
Diastolic blood pressure, mm Hg	65 (57–72)	61 (56–70)
Mean arterial pressure, mm Hg	85 (73–90)	83 (71–89)
Heart rate, beats/min	75 (65–90)	79 (66–103)
Temperature, °C	36.5 (35.0–37.3)	36.4 (35.4–37.1)
Cardiovascular Sequential Organ Failure Assessment	3 (1–4)	4 (1–4)
Laboratory values		
White blood cells, Giga/L	11.0 (8.6–14.7)	12.1 (9.7–15.3)
Hemoglobin, g/L	114 (103–128)	113 (98–133)
Platelets, Giga/L	178 (125–225)	191 (153–228)
Plasma sodium, mmol/L	141 (139–144)	141 (138–143)
Plasma glucose, mmol/L	7.5 (5.8–9.0)	7.4 (5.9–9.8)
Plasma protein, g/L	50 (44–58)	58 (46–62)
Serum albumin, g/L	28 (24–33)	31 (25–35)
Plasma creatinine, µmol/L	67 (50–89)	71 (52–84)
PaO_2, mm Hg[a]	147 (114–179)	151 (110–198)
$Paco_2$, mm Hg[a]	38 (33–45)	35 (32–40)
Arterial pH[a]	7.36 (7.29–7.40)	7.36 (7.29–7.44)
Arterial lactate, mmol/L	1.8 (1.8–3.1)	1.9 (1.5–3.1)

Result

Time course of adrenal function assessment according to treatment, saline solution (control) vs. hydrocortisone

	Before Treatment		During Treatment		
	H5	H6	H12	H24	H48
HC/control, no.	(46/47)	(45/46)	(39/45)	(41/43)	(35/35)
Cortisol, nmol/L					
HC	379 (174–457)	425 (289–579)	1383 (1062–2195)[b,c]	1105 (956–1415)[b,c]	1009 (819–1191)[b,c]
Control	317 (187–466)	422 (287–540)	447 (274–651)	368 (196–549)	334 (239–579)
11β-deoxycortisol, nmol/L					
HC	121 (36–190)	165 (112–291)	62 (31–161)[c]	20 (15–61)[c]	10 (8–19)[c]
Control	81 (26–149)	147 (104–275)	115 (58–172)[c]	32 (21–66)[c]	11 (8–34)[c]
Serum albumin, g/L					
HC	30 (24–36)	31 (25–35)	33 (25–36)	32 (26–35)	28 (24–32)[c]
Control	31 (26–33)	28 (24–33)	29 (26–31)	27 (24–32)	26 (22–31)[c]





	Control (n = 49	Hydrocortisone (n = 48)
During the 48-hr study period		
Maximum Sequential Organ Failure Assessment score	7 (5–9)	7 (5–9)
Maximum cardiovascular Sequential Organ Failure Assessment score	4 (2–4)	4 (0–4)
Cumulative fluid loading, mL/kg	39 (25–62)	35 (14–53)
Cumulative blood cell transfusion, no.	0 (0–3)	0 (0–2)
Urine output, mL/hr[a]	94 (75–122)	93 (79–123)
Maximum plasma glucose, mmol/L	8.3 (7.1–9.6)	9.0 (7.8–10.9)[b]
Patients with insulin, no.	15 (31%)	17 (35%)
During the 28-day follow-up		
Intensive care unit duration of stay, days	8 (4–17)	4 (1–10)
Duration of mechanical ventilation, days	4 (1–10)	2 (1–10)
Duration of norepinephrine support, days	2 (1–4)	2 (1–3)
28-day mortality, no.	6 (12%)	6 (13%)

Conclusion

1. 對於沒有敗血性休克的危急病人，使用hydrocortisone要來改善etomidate-related adrenal insufficiency上，並沒有好處。
2. 治療組在血行動力學上沒有明顯效果。

- 在沒有drug-induced hormonal derangement的危急病人上，還是可以考慮使用single dose etomidate。

Relationship Between Pain Severity and Outcomes in Patients Presenting With Potential Acute Coronary Syndromes

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Background

- 每年有6百萬人因胸痛至急診就診，將近2百萬人住院，而其中只有少數人的胸痛被診斷爲ischemic cause.
- 2~5%的AMI病人從急診被放走。
- 律師常以high pain score來質疑急診醫師讓這些病人出院的決定，即使這些是低冠心症風險的病人。

Objective

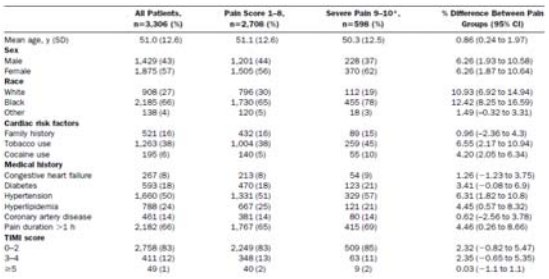
- 探討胸痛程度與in-hospital AMI的可能性及30天內發生心血管疾病的關聯性。

Materials and Methods

- Prospective cohort study
- Present to the ED with symptoms consistent with possible acute coronary syndrome.
- Patients were enrolled from 2005 through 2009.
- 排除traumatic chest pain, chest pain of a noncardiac cause, non-English speaking, or were pregnant.

- The ED was staffed 16 to 17 hours a day, 7 days a week, with trained research assistants.
- Primary outcome: 利用troponin-I來AMI盛行率
- Secondary outcome: 30天的評估
  - death, acute myocardial infarction, and revascularization procedure.

Results



	All Patients, n=3,306 (%)	Pain Score 1–8, n=2,708 (%)	Severe Pain 9–10*, n=598 (%)	% Difference Between Pain Groups (95% CI)
Mean age, y (SD)	51.0 (12.6)	51.1 (12.6)	50.3 (12.5)	0.86 (0.24 to 1.97)
Sex				
Male	1,429 (43)	1,201 (44)	228 (37)	6.26 (1.93 to 10.58)
Female	1,875 (57)	1,505 (56)	370 (62)	6.26 (1.87 to 10.64)
Race				
White	908 (27)	796 (30)	112 (19)	10.93 (6.92 to 14.94)
Black	2,185 (66)	1,730 (65)	455 (78)	12.42 (8.25 to 16.59)
Other	138 (4)	120 (5)	18 (3)	1.49 (−0.32 to 3.31)
Cardiac risk factors				
Family history	521 (16)	432 (16)	89 (15)	0.96 (−2.36 to 4.3)
Tobacco use	1,263 (38)	1,004 (38)	259 (45)	6.55 (2.17 to 10.94)
Cocaine use	195 (6)	140 (5)	55 (10)	4.20 (2.05 to 6.34)
Medical history				
Congestive heart failure	267 (8)	213 (8)	54 (9)	1.26 (−1.23 to 3.75)
Diabetes	593 (18)	470 (18)	123 (21)	3.41 (−0.08 to 6.9)
Hypertension	1,660 (50)	1,331 (51)	329 (57)	6.31 (1.82 to 10.8)
Hyperlipidemia	788 (24)	667 (25)	121 (21)	4.45 (0.57 to 8.32)
Coronary artery disease	461 (14)	381 (14)	80 (14)	0.62 (−2.56 to 3.78)
Pain duration >1 h	2,182 (66)	1,767 (65)	415 (69)	4.46 (0.26 to 8.66)
TIMI score				
0–2	2,758 (83)	2,249 (83)	509 (85)	2.32 (−0.82 to 5.47)
3–4	411 (12)	348 (13)	63 (11)	2.35 (−0.65 to 5.35)
≥5	49 (1)	40 (2)	9 (2)	0.03 (−1.1 to 1.1)

Results

Pain Score	No. (%) 1–8, N=2,708 (81.7%)	9–10, N=598 (18.1%)
Death	10 (0.4)	6 (1.0)
Acute myocardial infarction	82 (3.0)	23 (39)
Percutaneous coronary intervention or coronary bypass artery grafting	78 (2.9)	17 (2.8)
Composite	135 (5.0)	36 (6.0)

Results

	Adjusted RR (95% CI) for Inhospital Acute Myocardial Infarction	Adjusted RR (95% CI) for 30-Day Composite
Severe pain (score 9–10)	1.43 (0.91–2.22)	1.39 (0.98–1.97)
Male sex	1.48 (1.00–2.18)	1.53 (1.16–2.01)
White	1.25 (0.85–1.86)	1.43 (1.09–1.87)
TIMI score (0–2, 3–4, 5–7)	2.00 (1.05–3.80)	2.24 (1.39–3.60)
Age (10-y increment)	1.42 (0.68–2.95)	1.26 (0.75–2.11)
EMS arrival	1.73 (1.13–2.63)	1.23 (0.96–1.60)
Pain >1 h	1.36 (0.89–2.07)	0.80 (0.60–1.06)

RR, Relative risk.

Limitations

- 部分相關變因未受到控制或納入。例如：就醫過程中的NTG使用。
- 追蹤或收集案例的時間受限制。
  - 16~17 hours/day
- 追蹤中的案例造成的誤差。例如：回憶誤差。

Disscussion

- High follow-up rate: 93%
- 變因控制: 疼痛持續時間，由EMS送入急診。
- 胸痛嚴重度與AMI之間的關聯性的想法:
  - 教科書描述: AMI, angina
  - Other organ system: mesenteric infarction v.s. gastroenteritis

Conclusion

- 嚴重胸痛並不會增加冠心症的風險，並且疼痛的嚴重程度不應該視爲急性冠心症出院風險的因素之一。