Journal club

急性腎損傷早期介入洗腎較能降低死亡率嗎?

2021.09.14

第二加護病房 副護理長

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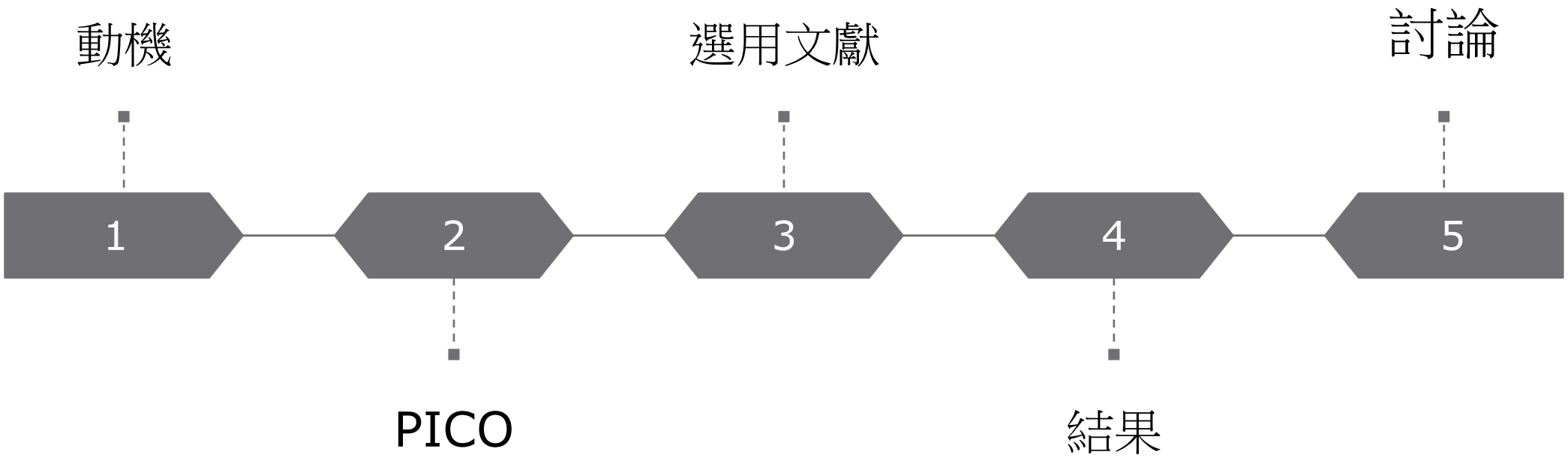
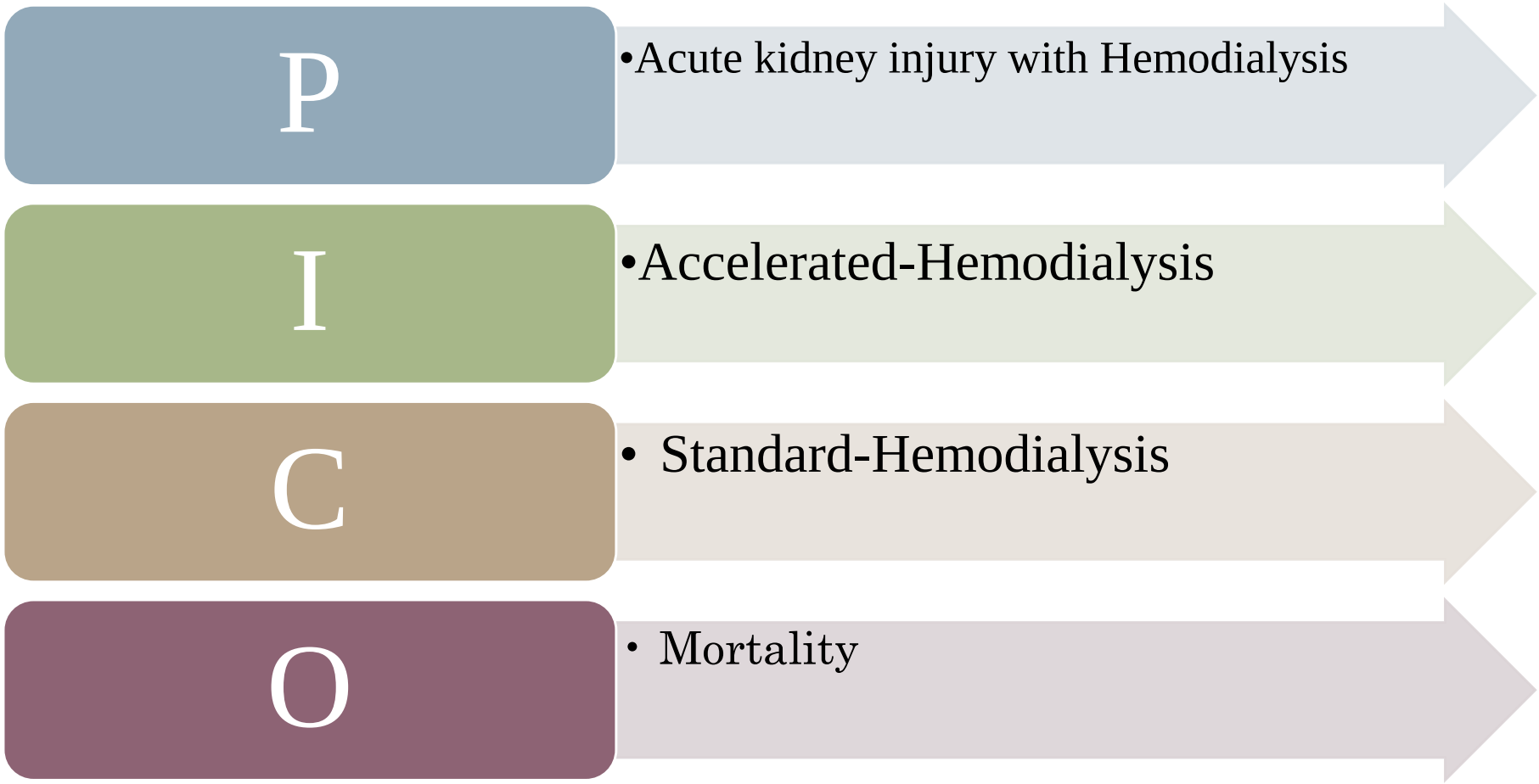
報告大綱



動機

- 急性腎衰竭很容易發生在重症加護病房住院的患者，當這些病人皆符合替代性腎臟療法時，究竟甚麼樣的**時機點**是最恰當的?
- 若夜間發生急性腎衰竭需要替代性腎臟療法時，
- 對於ICU護理師需要聯絡家屬、緊急準備用物、連絡相關科室醫師
- 對於HD護理師，需要值班人員執行緊急任務
- 對於家屬而言，夜間緊急前來醫院，心情更不安
- 對於醫師而言，需要值班醫師多放置管路，可能對於病人熟悉程度沒有向專責醫師熟悉
- 修訂替代性腎臟療法時，介入時機或許可以將時間變長，較具彈性

PICO


P
•Acute kidney injury with Hemodialysis
I
•Accelerated-Hemodialysis
C
• Standard-Hemodialysis
O
• Mortality

選用文獻

Timing of Initiation of Renal-Replacement Therapy in Acute Kidney Injury

The STARRT-AKI Investigators, for the Canadian Critical Care Trials Group, the Australian and New Zealand Intensive Care Society Clinical Trials Group, the United Kingdom Critical Care Research Group, the Canadian Nephrology Trials Network, and the Irish Critical Care Trials Group*

Impact factor:74.699

Randomization
1:1 with block size 2.4

Blind
no

Inclusion
18 years admitted to ICU with kidney dysfunction(KDIGO 2~3)

Accelerated-strategy group as soon as possible with 12 hours

Standard-strategy group at least 72hours or following criteria

Standard

Accelerated

KDIGO急性腎損傷分級

分級	Creatinine	尿量
1	Baseline 1.5-1.9倍 或 升高0.3mg/dL	<0.5mL/kg/h 6-12小時
2	Baseline 2.0-2.9倍	<0.5mL/kg/h ≥12小時
3	Baseline 3.0倍 或 超過4.0mg/dL 或 開始血液透析 或 小於18歲，eGFR<35	<0.3mL/kg/h 超過24小時 或 無尿超過12小時

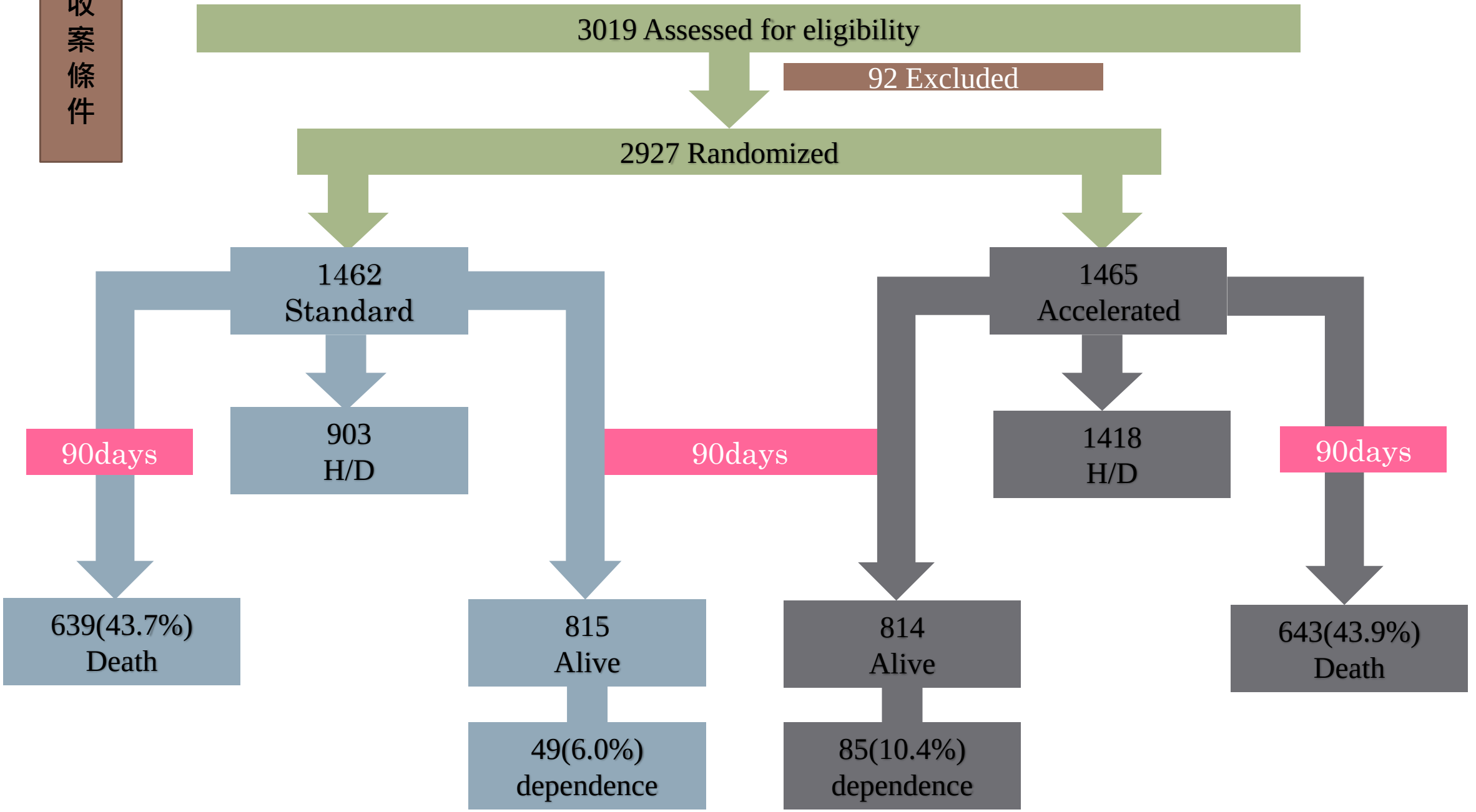
2012 KDIGO AKI Guideline

Cr >6mg/dl
HCO3<12mmol/L
Sever respiratory failure
or
AKI>72Hrs

As soon as possible
<12hrs

168 hospital in 15 countries

收案條件



結果

Table 2. Primary and Secondary Outcomes.*

	Accelerated Strategy (N=1465)	Standard Strategy (N=1462)	Relative Risk or Difference (95% CI)
Primary outcome			
Death from any cause at 90 days — no. (%)†	643 (43.9)	639 (43.7)	1.00 (0.93 to 1.09)‡
Secondary outcomes			
RRT dependence among survivors at 90 days — no./total no. (%)	85/814 (10.4)	49/815 (6.0)	1.74 (1.24 to 2.43)‡
Death or RRT dependence at 90 days — no./total no. (%)	728/1457 (50.0)	688/1454 (47.3)	1.06 (0.98 to 1.14)‡
Major adverse kidney events at 90 days — no./total no. (%)	867/1131 (76.7)	860/1115 (77.1)	0.99 (0.95 to 1.04)‡
Serum creatinine at 90 days — mg/dl§	1.20±1.00	1.23±1.00	−0.03 (−0.11 to 0.06)¶
Estimated glomerular filtration rate‖			
At 90 days — ml/min/1.73 m^2	65±30	64±31	0.31 (−3.88 to 4.49)¶
Reduction of >25% from baseline at 90 days — no./total no. (%)	139/403 (34.5)	172/427 (40.3)	0.86 (0.72 to 1.02)‡
Death from any cause — no./total no. (%)			
At any time in the ICU	461/1464 (31.5)	468/1462 (32.0)	0.98 (0.88 to 1.09)‡
At 28 days	538/1465 (36.7)	523/1462 (35.8)	1.03 (0.93 to 1.13)‡
During hospitalization	552/1458 (37.9)	546/1459 (37.4)	1.01 (0.92 to 1.11)‡
Use of health services			
Median no. of days of use (IQR)			
RRT-free days at 90 days**	50 (0 to 87)	64 (0 to 90)	−2.62 (−5.66 to 0.42)¶
RRT††	4 (2 to 8)	5 (3 to 9)	−0.48 (−0.82 to −0.14)¶
Continuous RRT††	4 (3 to 8)	5 (3 to 8)	−0.40 (−0.78 to −0.02)¶
Sustained low-efficiency dialysis††	2 (1 to 4)	2 (1 to 4)	0.15 (−0.65 to 0.96)¶
Intermittent hemodialysis††	2 (1 to 4)	3 (2 to 5)	−0.45 (−0.80 to −0.09)¶
Median length of stay in ICU (IQR) — days			
Survivors	9 (5 to 16)	10 (5 to 19)	−1.58 (−2.90 to −0.26)¶
Nonsurvivors	7 (3 to 13)	7 (4 to 15)	−1.33 (−2.56 to −0.09)¶
Median length of hospital stay (IQR) – days			
Survivors	28 (16 to 50)	29 (17 to 54)	−1.23 (−3.87 to 1.41)¶
Nonsurvivors	8 (3 to 18)	9 (4 to 19)	−0.99 (−2.66 to 0.67)¶
Median no. of ventilator-free days at 28 days (IQR)	13 (0 to 24)	12 (0 to 24)	0.50 (−0.34 to 1.35)¶
Median no. of days free of vasoactive agents at 28 days (IQR)	21 (0 to 26)	20 (0 to 26)	0.31 (−0.57 to 1.18)¶
Median no. of days out of ICU at 28 days (IQR)	8 (0 to 21)	4 (0 to 20)	0.69 (−0.06 to 1.43)¶
Median no. of days out of hospital at 90 days (IQR)	10 (0 to 65)	9 (0 to 64)	0.55 (−1.82 to 2.91)¶
Rehospitalization at 90 days — no./total no. (%)	191/913 (20.9)	156/916 (17.0)	1.23 (1.02 to 1.49)‡
Health-related quality of life			
Median score on EQ-5D-5L at 90 days (IQR)			
Descriptive system‡‡			
Mobility	2 (1 to 3)	2 (1 to 3)	−0.07 (−0.23 to 0.08)¶
Self care	1 (1 to 3)	1 (1 to 3)	−0.10 (−0.25 to 0.05)¶
Usual activities	2 (1 to 3)	2 (1 to 4)	−0.15 (−0.31 to 0.01)¶
Pain or discomfort	2 (1 to 3)	2 (1 to 3)	−0.04 (−0.17 to 0.08)¶
Anxiety or depression	1 (1 to 3)	2 (1 to 3)	−0.06 (−0.19 to 0.07)¶

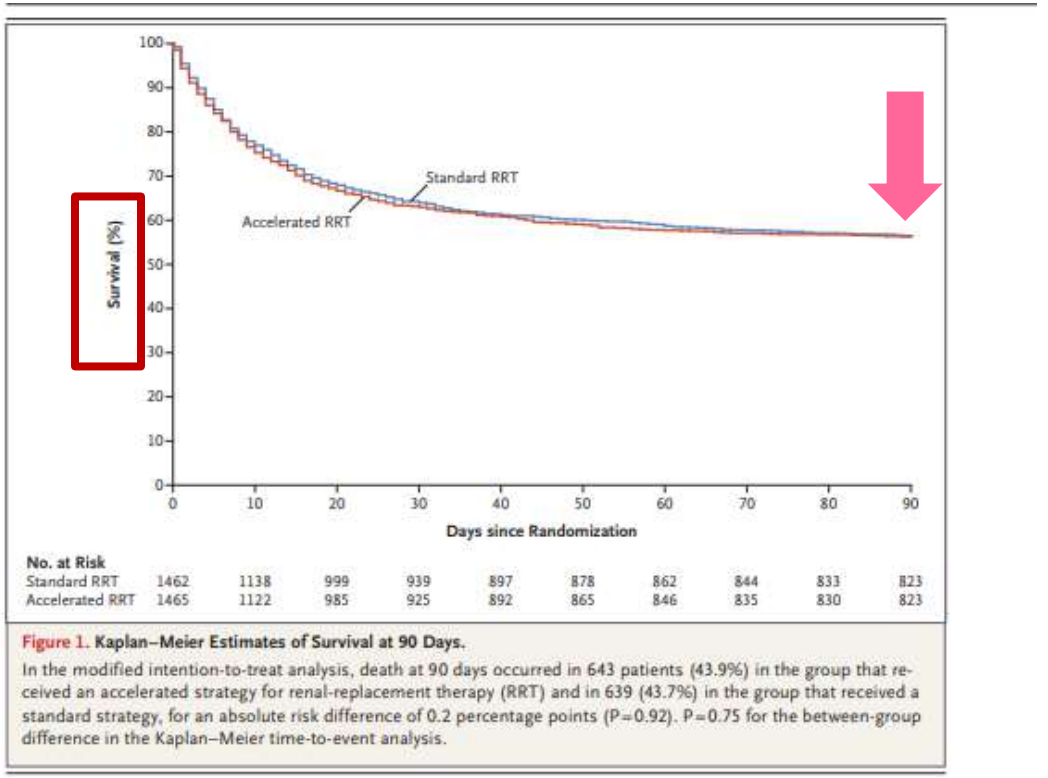


Figure 1. Kaplan–Meier Estimates of Survival at 90 Days.

In the modified intention-to-treat analysis, death at 90 days occurred in 643 patients (43.9%) in the group that received an accelerated strategy for renal-replacement therapy (RRT) and in 639 (43.7%) in the group that received a standard strategy, for an absolute risk difference of 0.2 percentage points (P=0.92). P=0.75 for the between-group difference in the Kaplan–Meier time-to-event analysis.

評讀文獻

CASP 隨機對照試驗檢核表

(A)研究結果可信嗎?

篩選問題

1. 研究問題是否清楚且聚焦? ☐是 ☐不明確 ☐否

考量點：一個聚焦的問題包括下列項目：

- 研究群體 18 years admitted to ICU with kidney dysfunction(KDIGO 2~3) Hemodialysis
- 介入措施 Accelerated-Hemodialysis
- 比較措施 Standard-Hemodialysis
- 研究的結果 Primary outcome was death any cause at from 90days
  Secondary outcome at 90 days were dependence hemodialysis

2. 受試者是否確實被隨機分派到不同組別? ☐是 ☐不明確 ☐否

考量點：

- 如何進行隨機分派? use of a centralized Web-based platform
- 研究者是否被隱匿分組訊息? 研究者會得知病人為哪一組

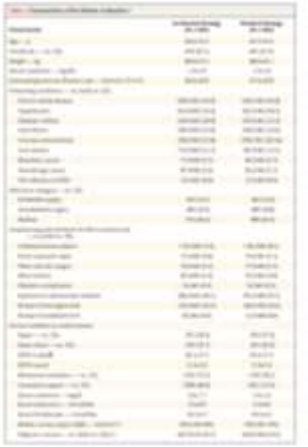
本篇文獻值得繼續閱讀!

SELECTION OF PATIENTS

Patients were eligible if they were 18 years or older and had been admitted to an ICU with kidney dysfunction (serum creatinine level, ≥1.13 mg per deciliter [100 μmol per liter] in women and ≥1.47 mg per deciliter [130 μmol per liter] in men) and severe acute kidney injury that was categorized as stage 2 or 3 of the Kidney Disease: Improving Global Outcomes (KDIGO) classification (in which stages range from 1 to 3, with higher stages indicating greater severity). This determination of kidney injury was defined by a doubling

Patients were randomly assigned in a 1:1 ratio to receive a strategy of accelerated or standard initiation of renal-replacement therapy. Randomization with variable block size (2 and 4) and site stratification were implemented with the use of a centralized Web-based platform.

The primary outcome was death from any cause at 90 days after randomization. Key secondary outcomes at 90 days were dependence on renal-replacement therapy; a composite of death or dependence on renal-replacement therapy; and a major adverse kidney event, which was defined as death, dependence on renal-replacement therapy, or a sustained reduction in kidney function (i.e., an estimated glomerular filtration rate [eGFR] of <75% of the baseline value[14]). Additional prespecified secondary outcomes included death in the ICU at 28 days or during hospitalization; the number of days free of renal-replacement therapy at 90 days; the number of ventilator-free and vasoactive-free days at 28 days[4,15]; the length of hospitalization and hospitalization-free days at 90 days; and health-related quality-of-life, as assessed at 90 days by means of the European Quality of Life–5-Dimensions 5-Level questionnaire (EQ-5D-5L; scores range from 0 to 100, with higher scores indicating a better quality of life).[16]



詳細問題

3. 受試者、健康相關工作人員及研究人員是否盲化？ □是 □不明確 □否

考量點：

- 健康工作人員，如: 醫師、護理師等 **血液透析此措施，無法雙盲**
- 研究人員，特別指結果評估者

4. 各組研究對象在一開始進入試驗時的基本特性是否相似? □是 □不明確 □否

考量點：審視其他可能的影響因素，例如：年齡、性別、社會階層等，這些也被稱為基準值的特質

5. 除了實驗的介入措施之外，各組的所有對待是否相同? □是 □不明確 □否

6. 是否所有進入試驗的受試者在研究結論當中均被適當的考量過? □是 □不明確 □否

考量點：

- 試驗有提早結束嗎? **無提早結束**
- 受試者是否一經隨機分派，均納入最後的分析?

Accelerated-Hemodialysis 有9名病患撤回同意書、7名病患失聯；Standard-Hemodialysis有18名病患撤回同意書、8名病患失聯，其餘均採Intention-To-Treat (ITT) analysis

Baseline characteristics were well balanced in the two groups (Table 1 and Table S5). In the entire population, chronic kidney disease was present in 1284 patients (43.9%); 965 patients (33.0%) had been admitted to undergo surgery, 1689 patients (57.7%) had sepsis, and the mean (±SD) SAPS II and SOFA scores were 58.8±17.4 and 11.7±3.6, respectively.

PATIENTS

From October 2015 through September 2019, a total of 11,852 patients met provisional eligibility. Of these patients, 3019 were randomly assigned to receive either an accelerated strategy for the initiation of renal-replacement therapy (1512 patients) or a standard strategy (1507 patients) (Fig. S2). The number of patients who were subsequently determined to be ineligible to participate were 31 (2.1%) in the accelerated-strategy group and 19 (1.3%) in the standard-strategy group (Table S4). In the accelerated-strategy group, 9 patients (0.6%) withdrew consent and 7 (0.5%) were lost to follow-up; the corresponding numbers in the standard-strategy group were 18 (1.2%) and 8 (0.5%). Thus, 2927 patients (1465 in the accelerated-strategy group and 1462 in the standard-strategy group) were included in the modified intention-to-treat analysis.

(B)研究結果為何?

7. 介入措施的效果有多大？

考量點：

- 測量那些結果?
- 主要結果是否有清楚界定?
- 每個研究結果有哪些發現?
- 是否有證據顯示有選擇性報告研究結果的情形?

Primary outcome ：any cause was Mortality from 90days
Secondary outcome：dependence hemodialysis after 90 days

8. 介入措施的效果估計有多精確?

考量點：

- 信賴區間為何?
- 是否具有統計顯著性?

Primary outcome and
Secondary outcome 95% CI

Primary outcome P=0.92
無顯著差異，代表早期介入洗腎無法降低死亡率

PRIMARY OUTCOME

In the modified intention-to-treat analysis, death at 90 days occurred in 643 patients (43.9%) in the accelerated-strategy group and in 639 (43.7%) in the standard-strategy group (relative risk, 1.00; 95% confidence interval [CI], 0.93 to 1.09), for an absolute risk difference of 0.2 percentage points (95% CI, −0.3 to 0.4; P=0.92) (Table 2, Fig. 1, and Fig. S4). Results were similar in the adjusted analysis (adjusted odds ratio, 1.05; 95% CI, 0.90 to 1.23).

SECONDARY OUTCOMES

Among the patients who were alive at 90 days, continued dependence on renal-replacement therapy was determined in 85 of 814 (10.4%) in the accelerated-strategy group and in 49 of 815 (6.0%) in the standard-strategy group (relative risk, 1.74; 95% CI, 1.24 to 2.43). This result was robust after inverse probability weighting and in a multinomial analysis (Table S8).

There was no meaningful between-group difference in the composite of death or dependence on renal-replacement therapy, major adverse kidney events at 90 days, death in the ICU at 28 days, or length of hospitalization (Table 2). In addi-

The primary outcome was death from any cause at 90 days after randomization. Key secondary outcomes at 90 days were dependence on renal-replacement therapy; a composite of death or dependence on renal-replacement therapy; and a major adverse kidney event, which was defined as death, dependence on renal-replacement therapy, or a sustained reduction in kidney function (i.e., an estimated glomerular filtration rate [eGFR] of <75% of the baseline value[14]). Additional prespecified secondary outcomes included death in the ICU at 28 days or during hospitalization; the number of days free of renal-replacement therapy at 90 days; the number of ventilator-free and vasoactive-free days at 28 days[4,15]; the length of hospitalization and hospitalization-free days at 90 days; and health-related quality-of-life, as assessed at 90 days by means of the European Quality of Life–5-Dimensions 5-Level questionnaire (EQ-5D-5L; scores range from 0 to 100, with higher scores indicating a better quality of life).[16]

(C)研究結果對於當地病人有幫助嗎?

9. 研究結果是否可以應用在你的情境當中(或當地族群?)? □是 □不明確 □否

本篇研究平均年齡為66.6歲

考量點：

- 你有理由相信你照顧的對象跟研究的受試者不同嗎?
- 如果是的話，在哪些方面不同?

根據本單位(ICU2)統計2019至今，收治病患平均年齡為66.89歲，男女比為6:4。此篇研究與本單位病患特質相符，就以這點來說可以應用於本單位

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10. 是否臨床上重要的結果均已被考量？ □是 □不明確 □否

考量點：

- 你希望看到其他有關結果的訊息嗎?
- 這篇試驗的需求有被清楚描述嗎?

這篇研究有呈現我們最想要看的臨床重要結果，是否能下降死亡率

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11. 介入措施所帶來的效益是否值得付出傷害及成本的代價? □是 □不明確 □否

考量點：

- 即使這一點文章內沒有提到，你的看法呢?

在部分醫師會希望腎臟科醫師提早進入洗腎，但此研究發現提早介入洗腎病人並不會降低死亡率，而提早洗腎在經濟層面會花費比較多費用及護理時數

討論

- 評估是否需要介入替代性洗腎療法，在臨床需考慮病人整體臨床狀況及病情變化(胸部X光是否積水等)，也需要考量家屬對於整體的治療態度
- 若病人為敗血症合併急性腎損傷患者，提早開始洗腎對於預後沒有顯著差異，因為主要死因仍為當初的感染造成
- **2020腎臟科醫學會急性腎損傷的共識**

Q 5-1-2 急性腎損傷接受腎臟替代療法的時機點：早一點開始接受透析是否比較好？

A 5-1-2 a 是否開始緊急腎臟替代療法的時機點：當調控水分、電解質和酸鹼平衡的能力受損並有危及生命的情形時，考慮需要開始腎臟替代療法。（BPS）

A 5-1-2 b 評估腎臟替代療法開始的時間點，需考慮病人整體的臨床狀況和病情變化，不建議只根據病人的肌酸酐和尿素氮的數值高低來決定是否開始透析。（BPS）

A 5-1-2 c 敗血症合併急性腎損傷患者，早期開始腎臟替代療法對於預後沒有顯著助益。（2C）

A 5-1-2 d 外科手術後合併急性腎損傷患者（尤其是開心手術），及早啟動腎臟替代療法可能降低死亡率，且有助於腎功能的恢復。（2C）

急性腎損傷病人早期洗腎，真的對病人有益處嗎?

- 贊同：0位
- 需要更多文獻支持：12位
- 不贊同：1位

THANK YOU