

IS EARLY TRACHEOSTOMY BETTER FOR SEVERE TRAUMATIC BRAIN INJURY? A META-ANALYSIS

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ORIGINAL ARTICLE

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嚴重創傷性腦損傷病人，早期氣切比較好嗎？

引言人:張鈺璉

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嚴重創傷性腦損傷病人 現況-

- (1)因長期臥床，較不易脫離呼吸器。
- (2)痰液量多且黏稠，部位多於肺葉深部。
- (3)常因感染肺炎，而持續施打抗生素。



住院天數延長

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Is Early Tracheostomy Better for Severe Traumatic Brain Injury? A Meta-Analysis.

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⊕ Author information

Abstract

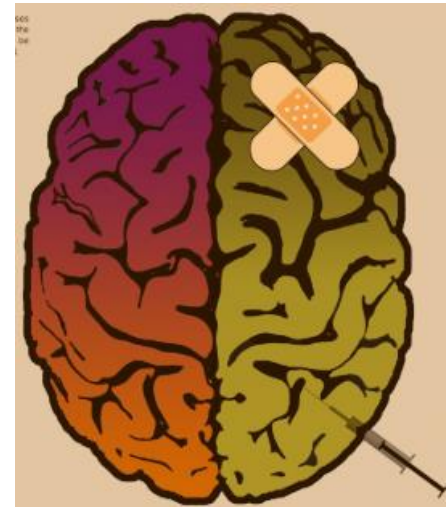
BACKGROUND: Tracheostomy has proven benefits for patients requiring prolonged mechanical ventilation. However, whether early tracheostomy (ET; <10 days after injury) can also improve outcomes in patients with severe traumatic brain injury (TBI) (Glasgow Coma Scale score ≤8) remains controversial. The aim of this study was to clarify this question.

METHODS: We searched 4 databases (PubMed, Web of Science, Elsevier ScienceDirect, and Cochrane Library) for articles comparing the outcomes of ET with late tracheotomy or prolonged intubation in patients with severe TBI. Two reviewers were asked to record the major outcome data as follows: length of intensive care unit (ICU) stay, duration of mechanical ventilation, mortality. Both random-effects and fixed-effects models were used.



INTRODUCTION

- Severe Traumatic Brain Injury定義：
為腦損傷導致意識喪失超過6小時，GCS:3-8分
- 防止缺氧發生，予Endo及呼吸器使用，以維持
呼吸道通暢。

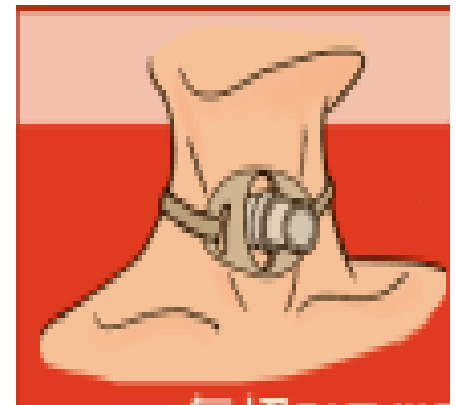


INTRODUCTION

- 臨床上這類插管的病人，10-14天或>14天後病人仍無法脫離呼吸器，此時醫師才會考慮執行氣切。

(本院狀況：視病人病況或家屬需求而定)

- 氣切可提供相對穩定的呼吸道，並且加速脫離呼吸器，降低呼吸器相關的風險，如肺炎，甚至易於執行口腔清潔。



INTRODUCTION

氣管內插管與氣管造口術的差異？			
氣管內插管		氣管造口術	
經鼻	經口	傳統手術	床旁
			
舒適度			
			
無		需要	
		手術及麻醉	
			
無(0%)		氣管造口術風險	
			
		出血(2%)	出血(2%)
		皮下氣腫(1.1%)	皮下氣腫(1.1%)
		呼吸道脫落(0.21%)	呼吸道脫落(0.2%)
		造口錯植(0.11%)	造口錯植(0.2%)
		傷口感染(1.5%)	傷口感染(1.5%)
0%		呼吸器脫離率	36.7%
67%		呼吸器相關肺炎風險	13.4%
			

步驟 1：研究探討的問題為何？

研究族群／問題 (Population/ Problem)：	Severe Traumatic brain injury
介入措施 (Intervention)：	Early tracheostomy(ET)
比較 (Comparison)：	late tracheostomy(LT) or endotracheal
結果 (Outcomes)：	length of ICU and hospital stays, duration of ventilation, mortality, and incidence of pneumonia

步驟 2：系統性文獻回顧的品質如何？ (**FAITH**)

F - 研究是否找到 (Find) 所有的相關證據？

最好的狀況是？我可以在哪裡找到這些資訊？良好的文獻搜尋至少應包括二個主要的資料庫(如：Medline, Cochrane 考科藍實證醫學資料庫, EMBASE 等)，並且加上文獻引用檢索(參考文獻中相關研究、Web of Science, Scopus 或Google Scholar)、試驗登錄資料等。文獻搜尋應不只限於英文，並且應同時使用 MeSH 字串及一般檢索詞彙(text words)。

Search Strategy

We searched for articles published between January 1995 and September 2017 comparing the effects of ET with those of late tracheostomy or prolonged intubation on the outcomes of patients with severe TBI in the PubMed, Web of Science, Elsevier, and Cochrane Library databases. The databases were queried using the following key words and Medical Subject Heading terms: “traumatic brain injury,” “brain trauma,” “tracheostomy,” and “outcome”. The results were limited to articles involving human subjects and published in the English language, and the references were checked manually for potential

評讀結果：☐ 是 ☐ 否 ☐ 不清楚

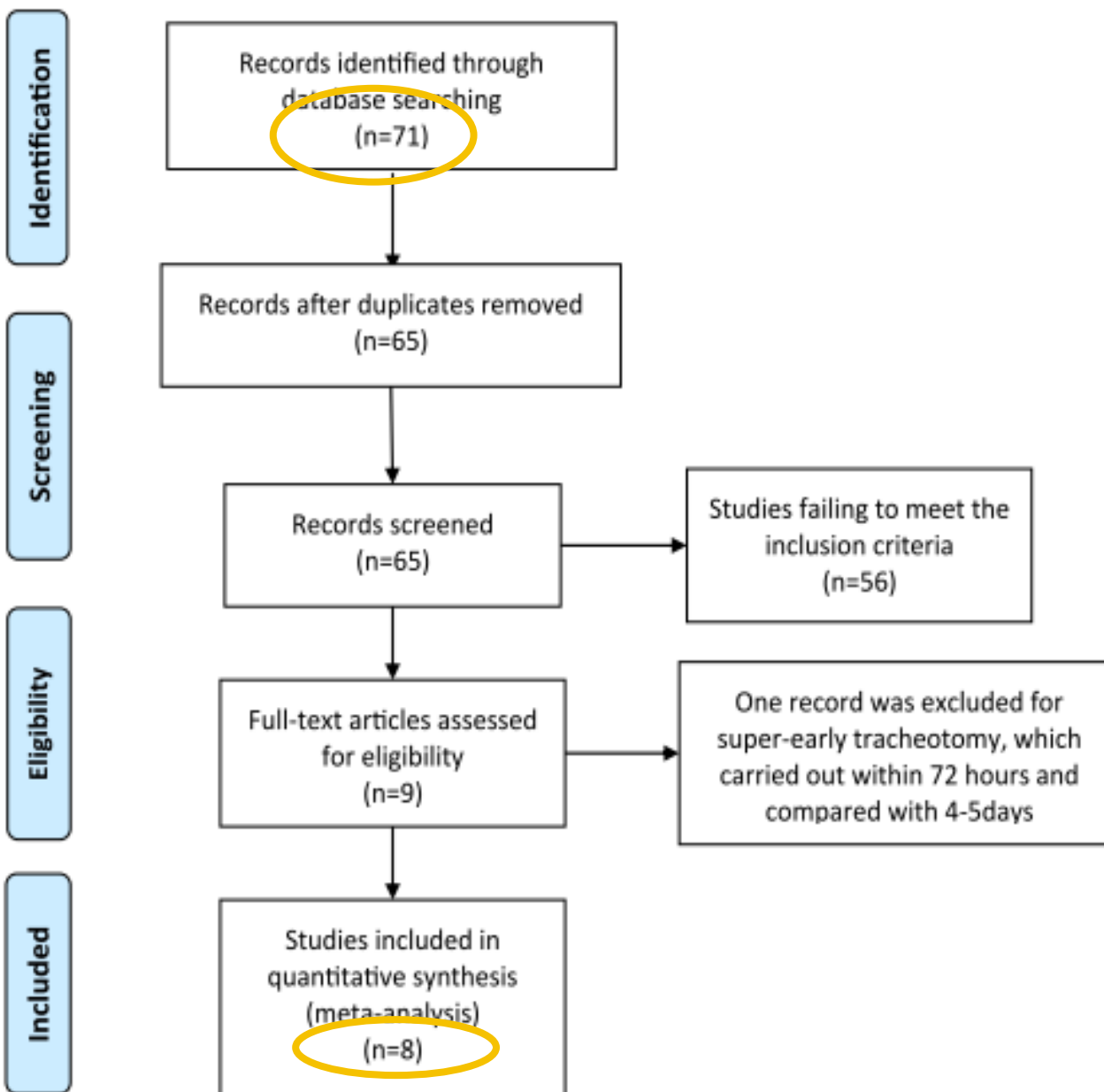


Figure 1. Flow diagram of the study selection process.

步驟 2：系統性文獻回顧的品質如何？ (**FAITH**)

A - 文獻是否經過嚴格評讀 (Appraisal)？

應根據不同臨床問題的文章類型，選擇適合的評讀工具，並說明每篇研究的品質（如針對治療型的臨床問題，選用隨機分配、盲法、及完整追蹤的研究類型）。

Data Extraction and Study Quality Assessment

Two independent reviewers evaluated the quality of studies and performed data extraction. The quality of RCT studies was evaluated using a method for assessing risk of bias from the Cochrane Collaboration, and observational studies were assessed using the Newcastle–Ottawa Quality Assessment Scale. Data extracted from eligible articles included name of first author, year of publication, sample size, patient characteristics, study design, and

評讀結果：是 否 ☐ 不清楚

investigators were called to discuss and reach a consensus.

步驟 2：系統性文獻回顧的品質如何？ (**FAITH**)

I - 是否只納入 (included) 具良好效度的文章？

僅進行文獻判讀是不足夠，系統性文獻回顧只納入至少要有一項研究結果是極小偏誤的試驗。

RESULTS

Our literature search identified a total of 71 potentially relevant articles. After a review of titles and abstracts, 8 articles that met our inclusion criteria were selected (**Figure 1**).⁹⁻¹⁶ The details of these studies are presented in **Table 1**. According to the Newcastle—Ottawa Quality Assessment Scale, each of the 5 retrospective studies had a score of >5 points.

評讀結果：是 否 ☐ 不清楚

步驟 2：系統性文獻回顧的品質如何？ (**FAITH**)

T - 作者是否以表格和圖表「總結」 (total up) 試驗結果？

應該用至少 1 個摘要表格呈現所納入的試驗結果。若結果相近，可針對結果進行統合分析(meta-analysis)，並以「森林圖」(forest plot)呈現研究結果，最好再加上異質性分析。

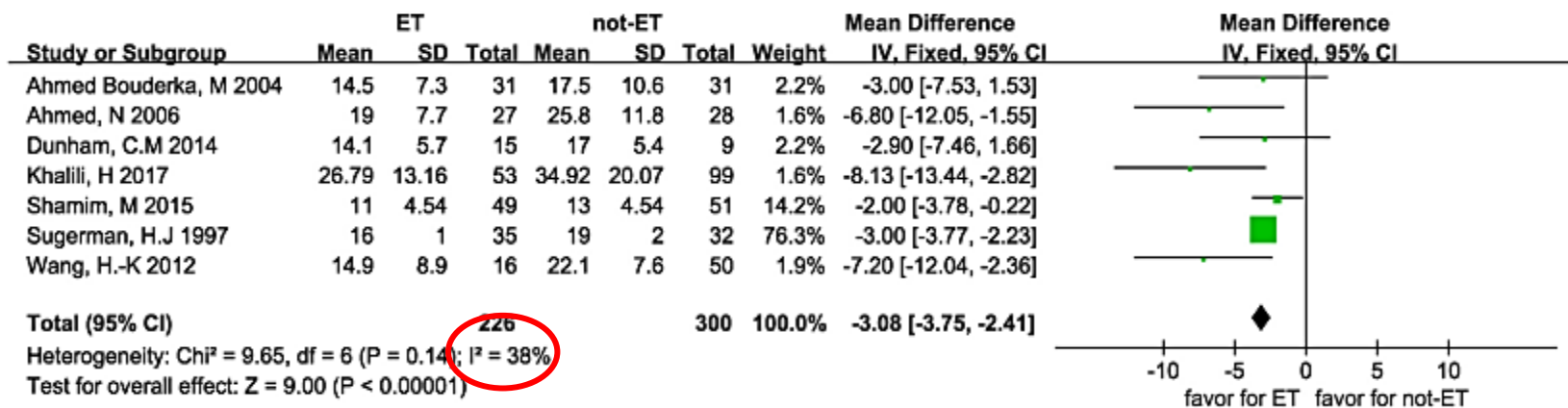
Study	Year	Country	Sample Size, Total (ET/Not-ET)	Sex, Total (ET/Not-ET)		Age (Years), ET/Not-ET, Mean $\pm$ SD	Definition of Early Tracheotomy	Late Tracheotomy or Prolonged Intubation	Time of Follow-Up
				Male	Female				
Bouderka et al. ⁹	2004	Morocco	62 (31/31)	38 (18/20)	20 (9/11)	41.1 $\pm$ 17.5/40 $\pm$ 19	5–6 days	Prolonged intubation	N/A
Ahmed and Kuo ¹⁰	2006	USA	55 (27/28)	35 (19/16)	20 (8/12)	43.1 $\pm$ 20/44.9 $\pm$ 23.6	7 days	Late tracheotomy	At discharge
Alali et al. ¹¹	2014	Canada	1142 (571/571)	N/A	N/A	N/A	8 days	Late tracheotomy	At discharge
Dunham et al. ¹²	2014	USA	24 (15/9)	N/A	N/A	33 $\pm$ 13/37 $\pm$ 16	3–5 days	Late tracheotomy	At discharge
Khalili et al. ¹³	2017	Iran	152 (53/99)	136 (50/86)	16 (3/13)	41.6 $\pm$ 19.8/37.78 $\pm$ 18.55	$\leq$ 6 days	Late tracheotomy	At discharge or 6 months postdischarge
Siddiqui et al. ¹⁴	2015	Pakistan	100 (49/51)	N/A	N/A	38.4 $\pm$ 17.9/31.0 $\pm$ 16.9	7 days	Prolonged intubation	Average follow-up 6 months
Sugerman et al. ¹⁵	1997	California							discharge
Wang et al. ¹⁶	2012	China							discharge

評讀結果： ☐ 是 ☐ 否 ☐ 不清楚

步驟 2：系統性文獻回顧的品質如何？ (FAITH)

H - 試驗的結果是否相近 - 異質性 (Heterogeneity) ?

在理想情況下，各個試驗的結果應相近或具同質性，若具有異質性，作者應評估差異是否顯著(卡方檢定)。根據每篇個別研究中不同的 PICO及研究方法，探討造成異質性的原因。



評讀結果： ☐ 是 ☐ 否 ☐ 不清楚

結果為何？

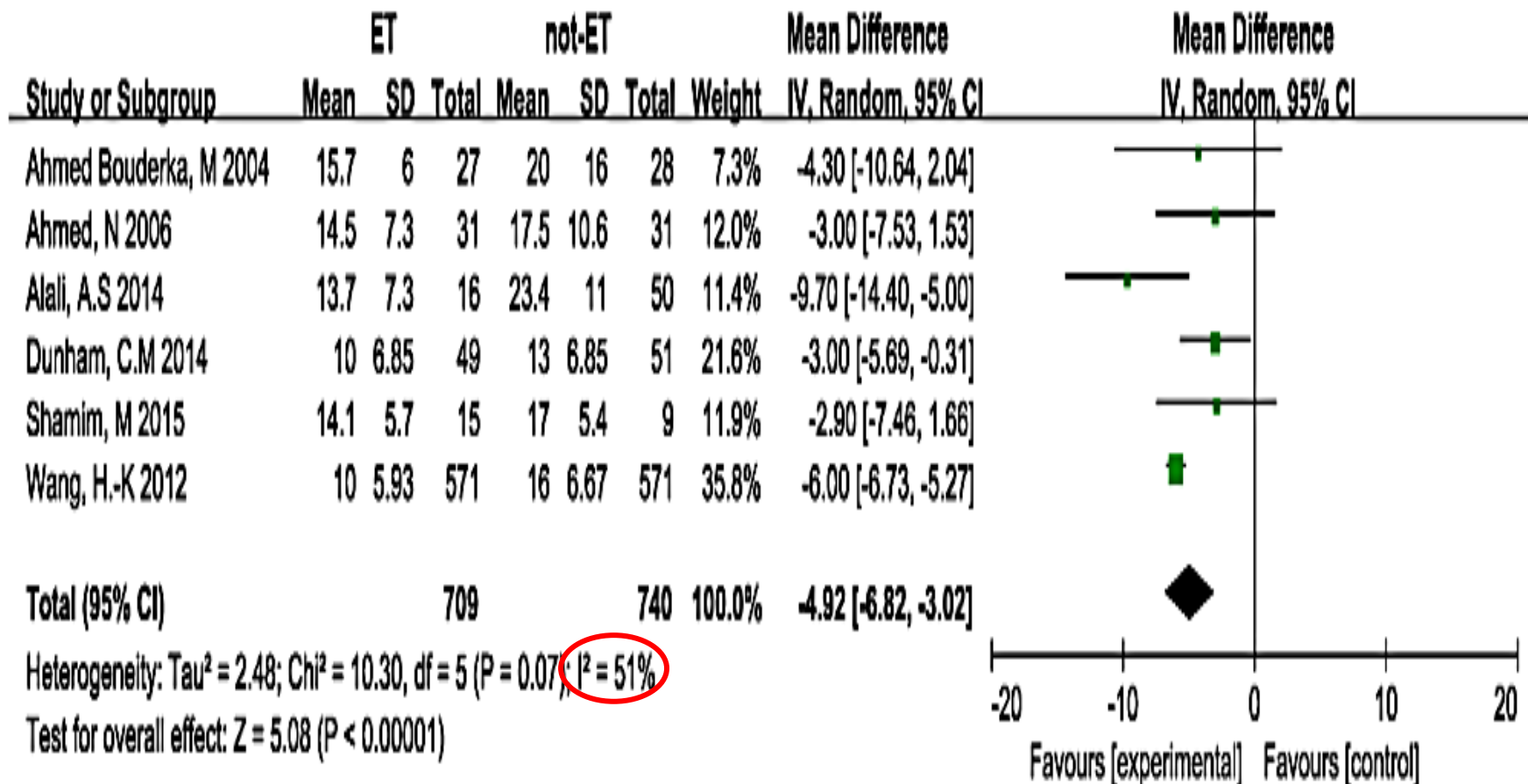
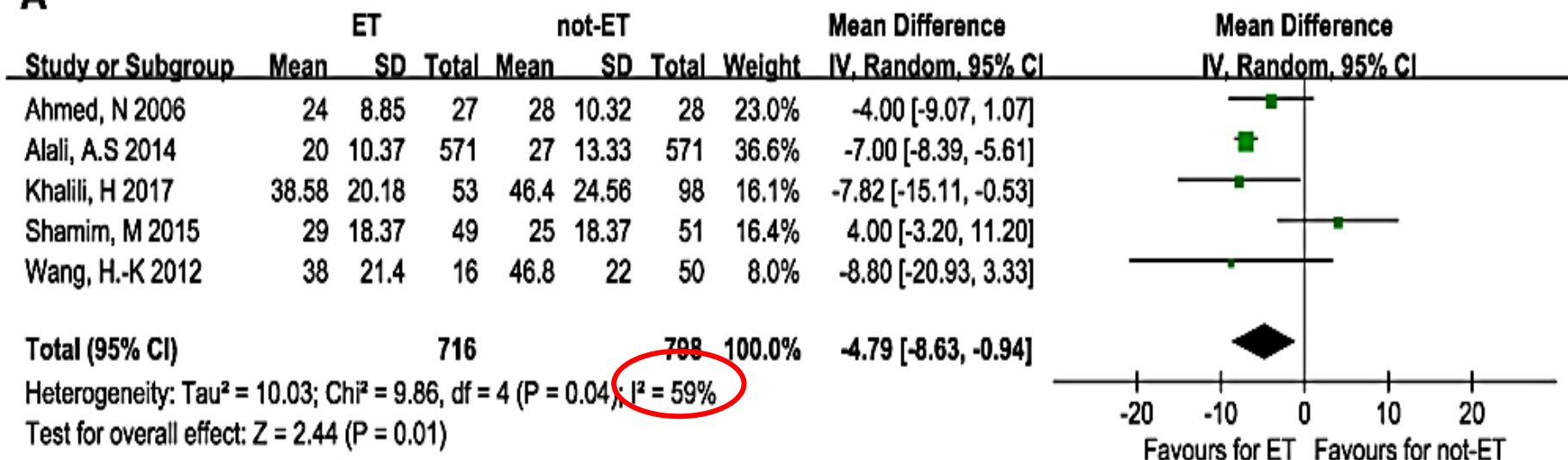


Figure 3. Duration of mechanical ventilation in the early tracheostomy (ET) and late tracheostomy or prolonged intubation (no ET) groups.

A



B

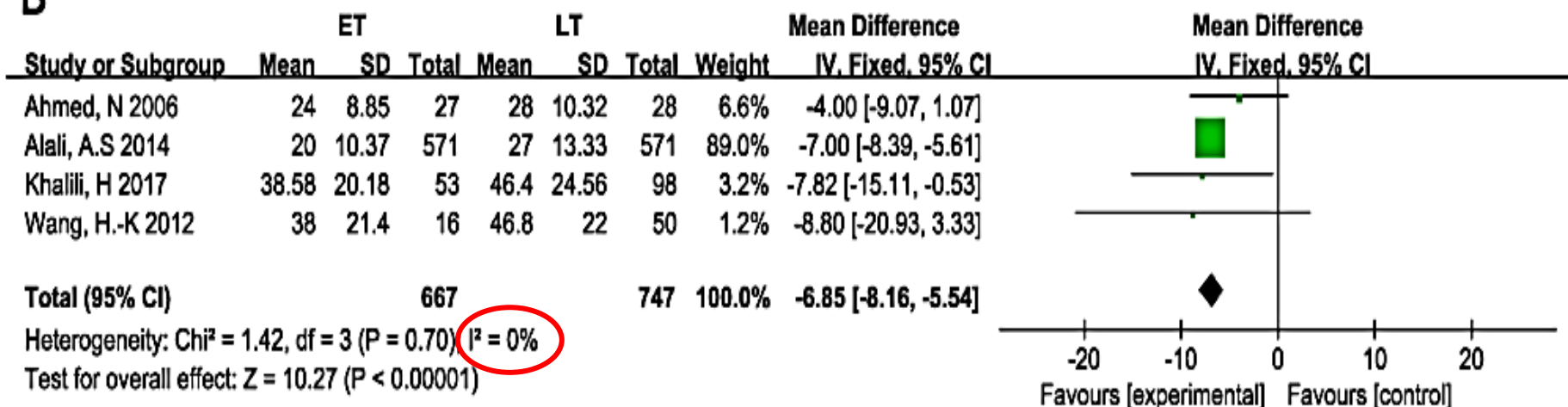


Figure 4. Length of hospital stay. (A) Early tracheostomy (ET) compared with late tracheostomy or prolonged intubation

(not-ET). (B) ET compared with late tracheostomy (LT).

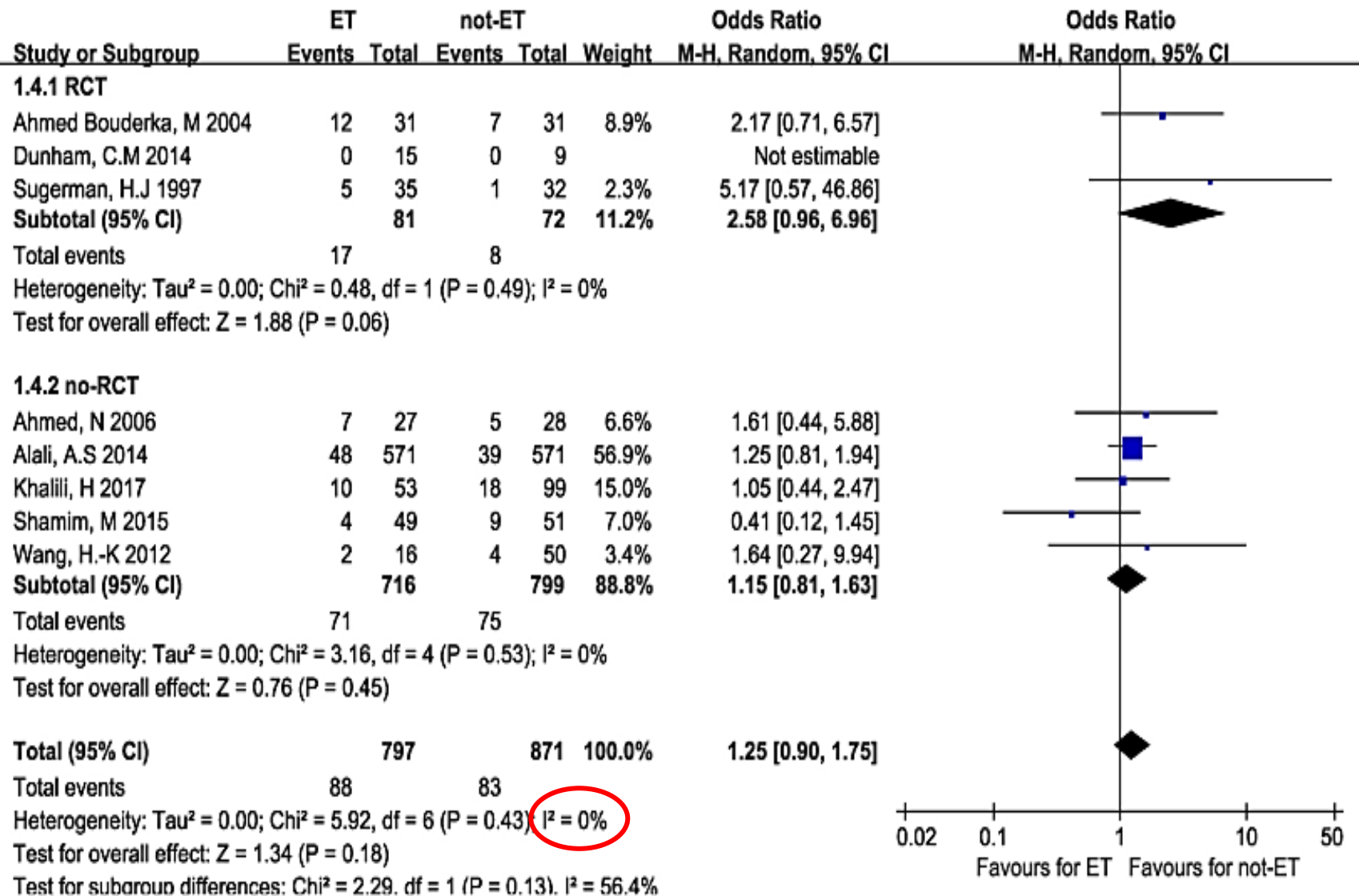


Figure 5. The rate of mortality in the early tracheostomy (ET) and late tracheostomy or prolonged intubation (not-ET) groups.

We defined subgroup as study design. RCT, randomized controlled trial.

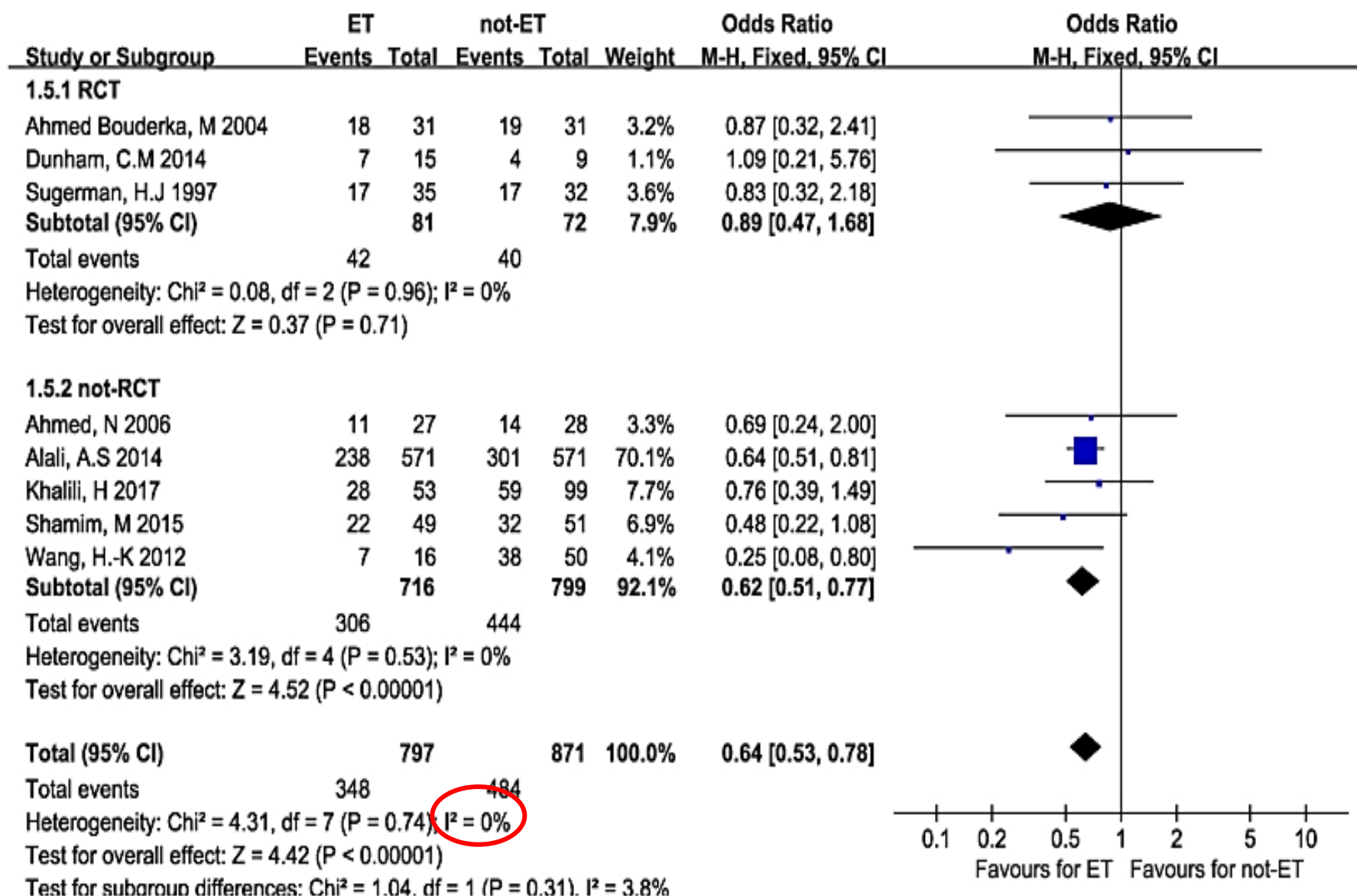


Figure 6. The incidence of pneumonia in the early tracheostomy (ET) and late tracheostomy or prolonged intubation (not-ET) groups.

We defined subgroup by study design such as RCT and no-RCT. RCT, randomized controlled trial.

CONCLUSIONS

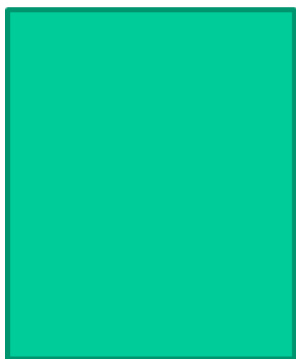
- ET (within 10 days) in patients with severe TBI is recommended, considering the benefit of ET on the length of ICU and hospital stays, duration of ventilation, and incidence of pneumonia.
- ET cannot reduce the mortality rate.

討論

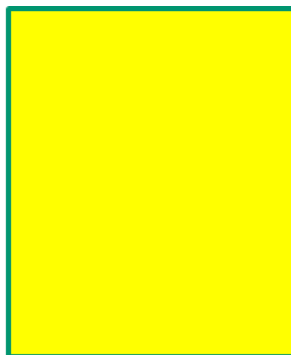
請問：



嚴重創傷性腦損傷病人，
早期氣切比較好嗎？



同意



有疑慮



不同意

綠(同意):10人
黃(需討論):1人
紅(不同意):24人



