實證醫學競賽

D組:一般科PGY　　花晨祐　醫師

組員:　　檢驗醫學科　　顏　雅　醫檢師

專科護理師組　簡珮紋　專師

2023/12/19

臨床情境一

林女士 55 歲, HTN , Type 2 DM, CKD(5), 藥物控制成效差

→被告知可能要做透析治療準備

→因工作無法接受每週透析三次

→近日不適噁心、嘔吐,四肢腫脹

→呼吸喘,漸漸嗜睡

→建議緊急透析治療

病人考量的問題

→「現在要緊急透析一定要用血液透析 (HD) 嗎？不可以用腹膜透析 (PD)嗎？」

→「如果可以用腹膜透析 ,是否預防性給予抗生素可以減少腹膜炎發生？」

→「透析要用抗凝血劑 ,是否發生中風之風險較高？」

→「血液透析與腹膜透析發生中風的風險有何不同?」

→「 血液透析之動靜脈廔管遠紅外線是否可以維持血液透動靜脈廔管的通暢性？」

背景資訊

ESRD 患者發生中風的風險是一般人群的 3-10 倍。
血壓的反覆變化可能會使患者容易患出血性中風。

Definition and criteria for chronic kidney disease

Definition:

Chronic kidney disease is defined based on the presence of either kidney damage or decreased kidney function for three or more months, irrespective of cause.

Criteria	Comment
Duration ≥3 months, based on documentation or inference	Duration is necessary to distinguish chronic from acute kidney diseases. ▪ Clinical evaluation can often suggest duration ▪ Documentation of duration is usually not available in epidemiologic studies
Glomerular filtration rate (GFR) <60 mL/min/1.73 m^2	GFR is the best overall index of kidney function in health and disease. ▪ The normal GFR in young adults is approximately 125 mL/min/1.73 m^2; GFR <15 mL/min/1.73 m^2 is defined as kidney failure ▪ Decreased GFR can be detected by current estimating equations for GFR based on serum creatinine (estimated GFR) but not by serum creatinine alone ▪ Decreased estimated GFR can be confirmed by measured GFR, measured creatinine clearance, or estimated GFR using cystatin C
Kidney damage, as defined by structural abnormalities or functional abnormalities other than decreased GFR	Pathologic abnormalities (examples). Cause is based on underlying illness and pathology. Markers of kidney damage may reflect pathology. ▪ Glomerular diseases (diabetes, autoimmune diseases, systemic infections, drugs, neoplasia) ▪ Vascular diseases (atherosclerosis, hypertension, ischemia, vasculitis, thrombotic microangiopathy) ▪ Tubulointerstitial diseases (urinary tract infections, stones, obstruction, drug toxicity) ▪ Cystic disease (polycystic kidney disease)
	History of kidney transplantation. In addition to pathologic abnormalities observed in native kidneys, common pathologic abnormalities include the following: ▪ Chronic allograft nephropathy (non-specific findings of tubular atrophy, interstitial fibrosis, vascular and glomerular sclerosis) ▪ Rejection ▪ Drug toxicity (calcineurin inhibitors) ▪ BK virus nephropathy ▪ Recurrent disease (glomerular disease, oxalosis, Fabry disease)
	Albuminuria as a marker of kidney damage (increased glomerular permeability, urine albumin-to-creatinine ratio [ACR] >30 mg/g).* ▪ The normal urine ACR in young adults is <10 mg/g. Urine ACR categories 10-29, 30-300 and >300 mg are termed "mildly increased, moderately increased, and severely increased" respectively. Urine ACR >2200 mg/g is accompanied by signs and symptoms of nephrotic syndrome (low serum albumin, edema and high serum cholesterol). ▪ Threshold value corresponds approximately to urine dipstick values of trace or 1+, depending on urine concentration ▪ High urine ACR can be confirmed by urine albumin excretion in a timed urine collection
	Urinary sediment abnormalities as markers of kidney damage, for example: ▪ RBC casts in proliferative glomerulonephritis ▪ WBC casts in pyelonephritis or interstitial nephritis ▪ Oval fat bodies or fatty casts in diseases with proteinuria ▪ Granular casts and renal tubular epithelial cells in many parenchymal diseases (non-specific)
	Imaging abnormalities as markers of kidney damage (ultrasound, computed tomography and magnetic resonance imaging with or without contrast, isotope scans, angiography). ▪ Polycystic kidneys ▪ Hydronephrosis due to obstruction ▪ Cortical scarring due to infarcts, pyelonephritis or vesicoureteral reflux ▪ Renal masses or enlarged kidneys due to infiltrative diseases ▪ Renal artery stenosis ▪ Small and echogenic kidneys (common in later stages of CKD due to many parenchymal diseases)

* Albumin-to-creatinine ratio (ACR) conversion factor 1.0 mg/g = 0.113 mg/mmol.

根據臨床問題形成的PICO-1

糖尿腎病變病人使用腹膜透析和血液透析發生中風的風險有多高?

	PICO / 關鍵字	MeSH 同義詞	中文關鍵字
P	Diabetic Nephropathy	Diabetic Nephropathy Diabetic Kidney Disease	糖尿腎病變病人
I	Peritoneal dialysis		腹膜模透析
C	Hemodialysis		血液透析
O	Stroke	Cerebrovascular Accident	中風

□治療/預防型問題　□診斷型問題　■預後型問題　□傷害/病因型問題

根據臨床問題形成的PICO-2

血液透析的病人使用遠紅外線照射是否可以維持動靜脈廔管通透性?

	PICO / 關鍵字	MeSH 同義詞	中文關鍵字
P	Hemodialysis		血液透析
I	far-infrared radiation		遠紅外線照射
C			
O	hemodialysis care of venous fistula		靜脈廔管通透性

■治療/預防型問題 □診斷型問題 □預後型問題 □傷害/病因型問題

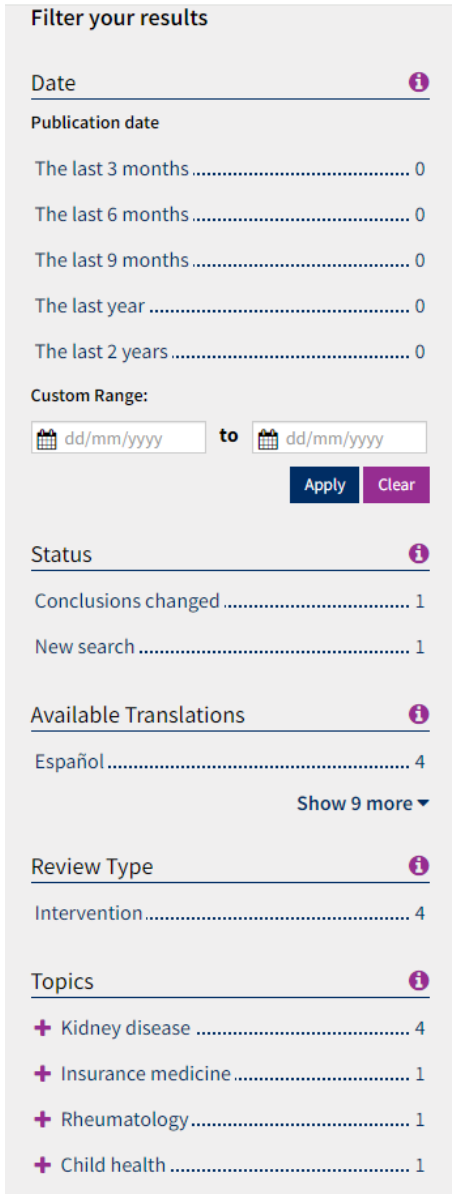
檢索策略-提升檢索效率

首先以『P』、『I』做搜尋，再依據結果適當加入關鍵字及同義詞

P	AND	I	AND	C	AND	O
Diabetic Nephropathy		Peritoneal dialysis		Hemodialysis		Stroke

限定搜尋範圍	Full text、With in 5 years、Human species
限定研究類型	Systematic review、Meta-Analysis、Randomized Controlled Trial
限定語言地區	English、Chinese (台灣本土文獻)

搜尋 Cochrane Library



輸入關鍵字、適當使用布林邏輯

Peritoneal dialysis 『AND』 Hemodialysis 『AND』 stroke

限定適當限定適當文章類型 『 Cochrane Reviews 』

限定適當搜尋範圍

限定『5年』內之文章(2019~2023)

搜尋 Pubmed

TEXT AVAILABILITY

- [ ] Abstract
- [x] Free full text
- [ ] Full text

ARTICLE ATTRIBUTE

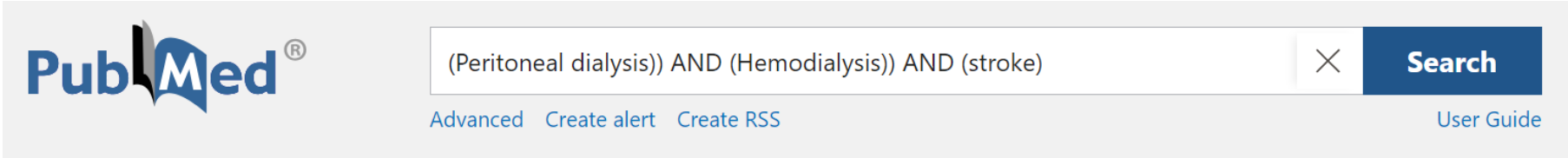
- [ ] Associated data

ARTICLE TYPE

- [ ] Books and Documents
- [ ] Clinical Trial
- [x] Meta-Analysis
- [ ] Randomized Controlled Trial
- [ ] Review
- [x] Systematic Review

PUBLICATION DATE

- ( ) 1 year
- (•) 5 years
- ( ) 10 years
- ( ) Custom Range



輸入關鍵字、適當使用布林邏輯

Peritoneal dialysis 『AND』 Hemodialysis 『AND』 stroke

限定適當限定適當文章類型 『Systematic Reviews 、Meta-Analysis』

限定適當搜尋範圍

限定『Full text』有全文可供評讀

限定『5年』內之文章

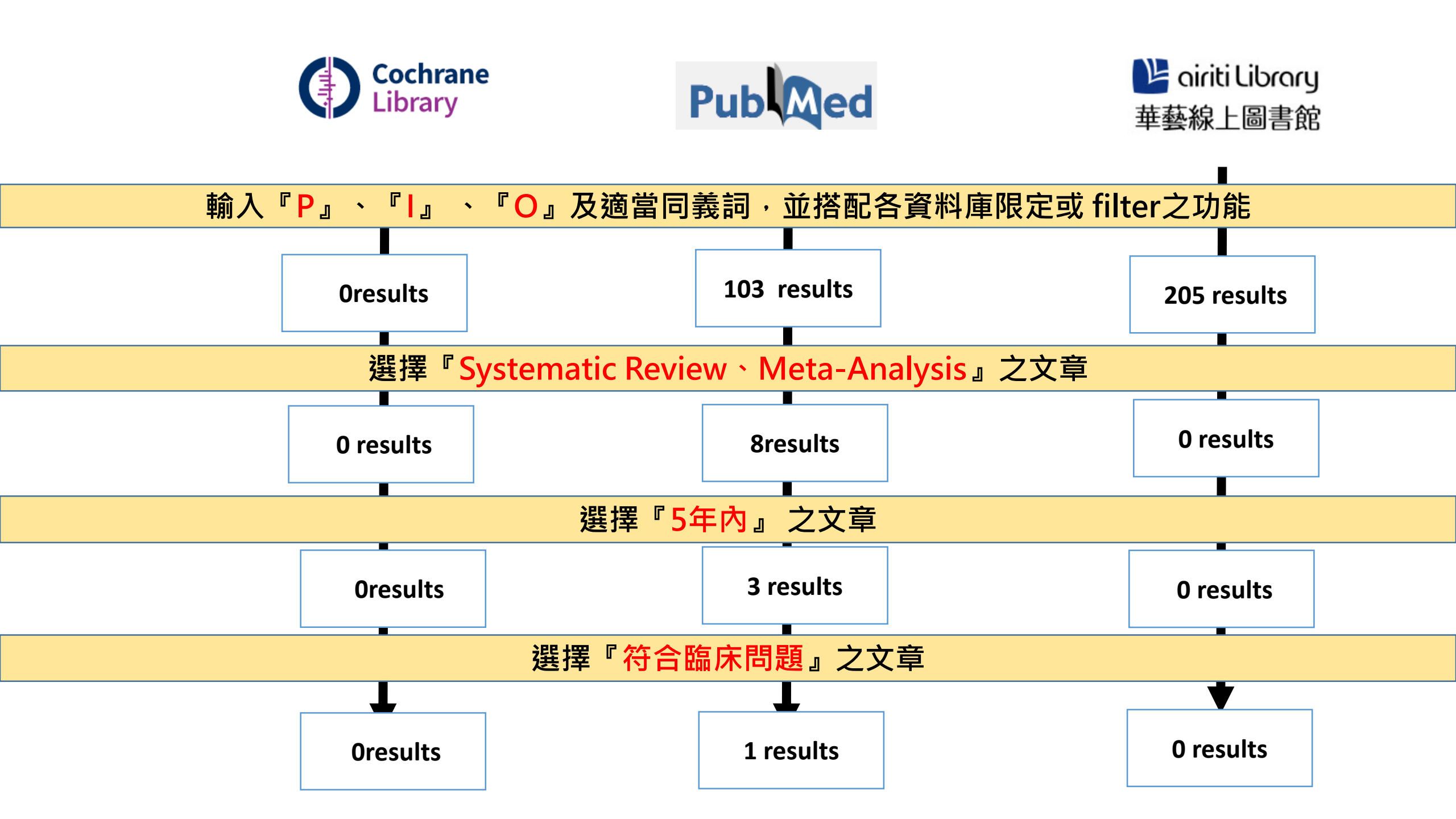
限定『English、Chinese』之語言文章類型

airiti Library
華藝線上圖書館

搜尋 華藝線上圖書館

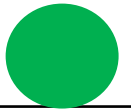
輸入關鍵字、適當使用布林邏輯
血液透析『AND』 透析治療

限定適當搜尋範圍
限定『5年』內之文章(2019~2023)


Cochrane Library
PubMed
airiti Library
華藝線上圖書館
輸入『P』、『I』、『O』及適當同義詞，並搭配各資料庫限定或 filter之功能
0results
103 results
205 results
選擇『Systematic Review、Meta-Analysis』之文章
0 results
8results
0 results
選擇『5年內』之文章
0results
3 results
0 results
選擇『符合臨床問題』之文章
0results
1 results
0 results

來源	標題	年份
PubMed	Comparison of risk of stroke in patients treated with peritoneal dialysis and hemodialysis: a systematic review and meta-analysis	2019

收納文獻比較-選出最佳文獻

M	Systematic Review	
P	**Nephropathy**	
I	peritoneal dialysis	
C	Hemodialysis	
O	stroke	
T	2019	

嚴格評讀之文章及評讀工具

CASP Systematic Review Checklist
CASP 系統性文獻回顧檢核表

- 較新的發表年份
- 有全文可供評讀
- 符合臨床情境

Validity

1. Did the review address a clearly focused question ?
   此回顧是否問了一個清楚、明確的臨床問題？

RENAL FAILURE
2019, VOL. 41, NO. 1, 650–656
https://doi.org/10.1080/0886022X.2019.1632210

Taylor & Francis
Taylor & Francis Group

STATE OF THE ART REVIEW

OPEN ACCESS Check for updates

Comparison of risk of stroke in patients treated with peritoneal dialysis and hemodialysis: a systematic review and meta-analysis

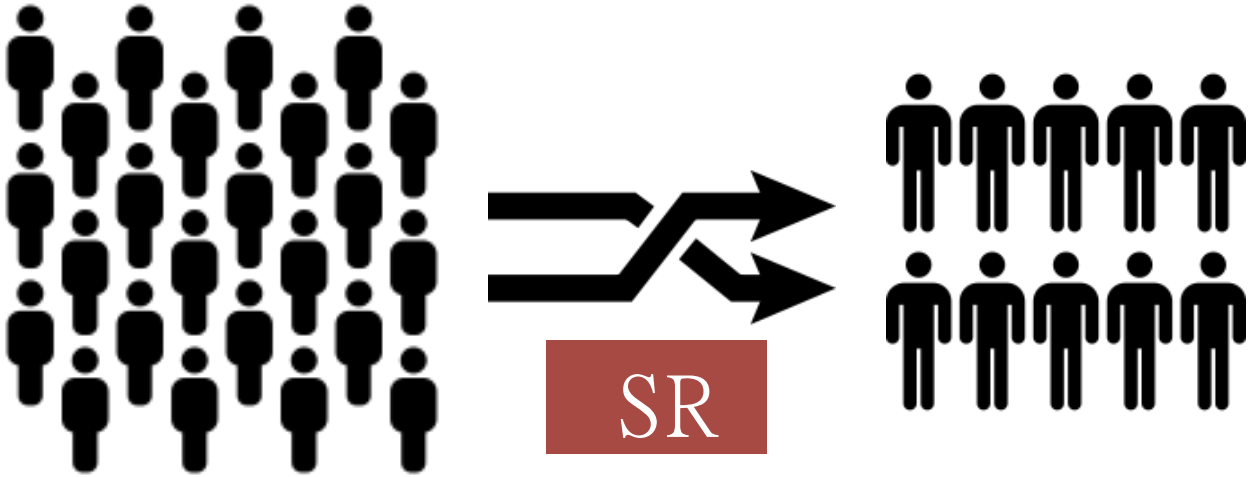
Introduction

The global prevalence of end-stage renal disease (ESRD) has increased sharply in recent years. Hemodialysis (HD) and peritoneal dialysis (PD) have been widely accepted for treatment of ESRD [1]. Cardiovascular disease (CVD) is the most common cause of morbidity and mortality in ESRD patients in whom dialysis therapy is initiated, accounting for 33% of hospitalizations, 37% of rehospitalizations, and 41% of deaths [2]. Stroke represents one of the main causes of cardiovascular mortality in patients with ESRD [3,4]. PD has been considered to be superior to HD for cerebrovascular protection because anticoagulation is not required during PD, and PD maintains better control of hypertension. However, PD patients may experience altered glucose metabolism, hypervolemia and exposure to glycated end products from the dialysate, which promote arteriosclerosis [5].

評讀結果

P	end-stage renal disease
I	peritoneal dialysis (PD)
C	Hemodialysis (HD)
O	stroke

■ Yes ☐ No ☐ Unclear



Validity

2. Did the authors look for the right type of papers?

作者是否收納適當的研究類型？

Comparison of risk of stroke in patients treated with peritoneal dialysis and hemodialysis: a systematic review and meta-analysis

Xiaojiang Zhan, Mei Yang, Yanbing Chen, Li Zhang, Caixia Yan and Yu Wang

Department of Nephrology, The First Affiliated Hospital of Nanchang University, Nanchang, Jiangxi, China

ABSTRACT

Objective: Accumulating evidence has demonstrated that dialysis patients are at increased risk for stroke. However, the impact of dialysis modalities on stroke risk remains controversial. We conducted a systematic review and meta-analysis to determine the effect of peritoneal dialysis (PD) and hemodialysis (HD) on stroke risk.

Methods: A systematic search of PubMed, EMBASE, and Web of Science was performed to identify articles comparing the stroke outcomes of dialysis patients. Hazard ratios (HRs) with 95% confidence intervals (95% CIs) were extracted and synthesized to examine stroke outcomes, including ischemic stroke, hemorrhagic stroke, and overall stroke.

Results: The search yielded five studies composed of 1,219,245 patients that were evaluated in the final analysis. The results showed that PD was associated with a lower risk for hemorrhagic stroke compared with HD (HR = 0.78; 95% CI: 0.69–0.88; $p < 0.001$). For ischemic stroke, the results showed that PD was associated with a higher risk compared with HD among the non-Asian patients (HR = 1.13; 95% CI: 1.05–1.23; $p = 0.002$), but there were no significant differences between PD and HD for the Asian patients. Similarly, there were no significant differences between the effects of the PD and HD approaches on overall stroke risk.

Conclusions: We observed that PD patients were less likely to develop hemorrhagic stroke than HD patients, and the risk for ischemic stroke was significantly higher for PD patients than for HD patients among the non-Asian patients. However, our findings could be biased due to the heterogeneity of the included studies.

ARTICLE HISTORY
Received 5 November 2018
Revised 5 April 2019
Accepted 8 April 2019

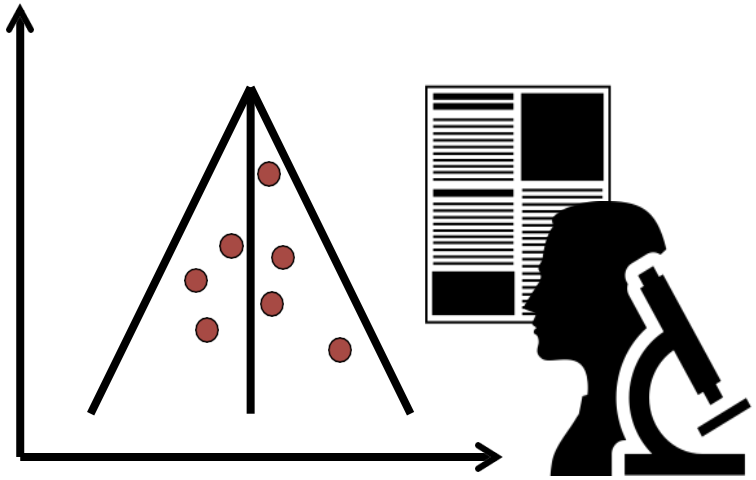
KEYWORDS
Peritoneal dialysis; hemodialysis; stroke; meta-analysis

評讀結果

優點:

1. 收錄符合問題的文章
2. 清楚定義了納入條件
3. 清楚定義了排除條件

■ Yes ☐ No ☐ Unclear



Validity

3. Do you think the important, relevant studies were included?
   重要、相關的研究是否皆被納入？

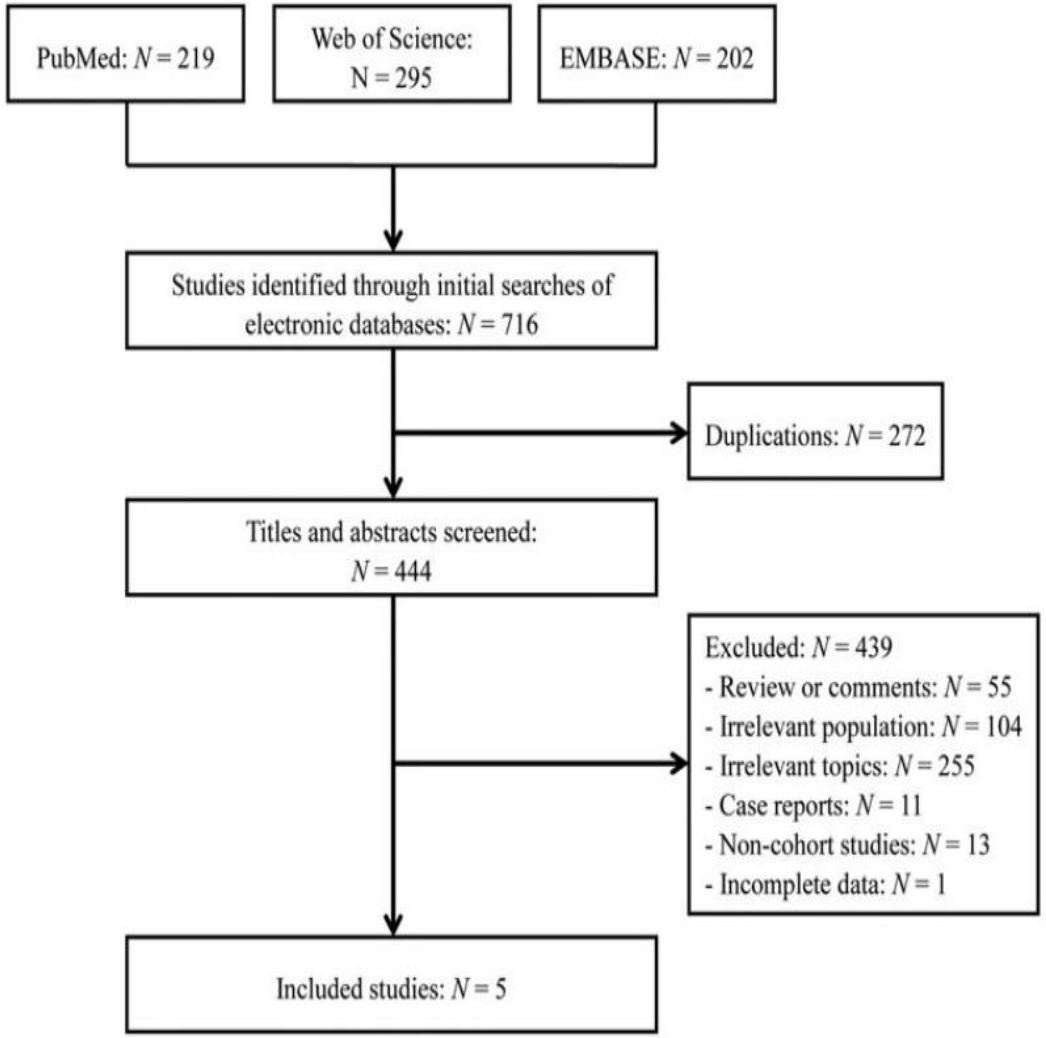


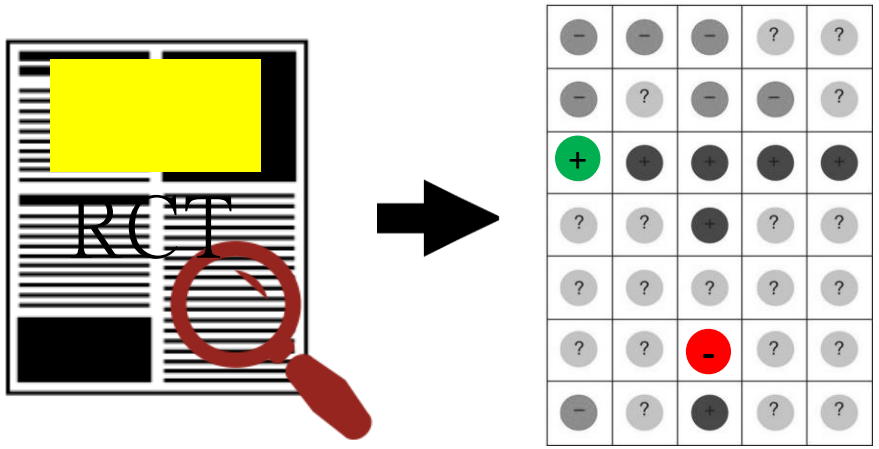
Figure 1. Flow diagram of studies identified, included and excluded.

評讀結果

優點:

1. 作者盡可能搜尋各種一級和二級資料庫
2. 列出 flow chart 清楚說明納入、排除理由

■ Yes ☐ No ☐ Unclear



Validity

4. Did the review's authors do enough to assess the quality of the included studies?
作者是否有評估收納研究的品質？

Data extraction

Two reviewers (X.Z. and M.Y.) independently extracted data from the included studies, and any discrepancy was resolved by discussion until a consensus was reached. The following information was extracted from each included study: the first author's name, country of the population studied, year of publication, study design, inclusion and exclusion criteria, sample size, follow-up duration, characteristics of the study population, stroke events recorded, adjusted confounding variables, and study quality. In all cases of missing or incomplete data, the corresponding authors were contacted.

Statistical analysis

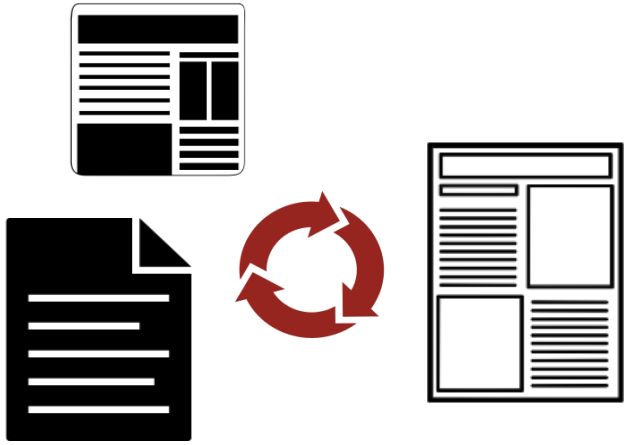
This systematic review was performed according to the recommendations of the Cochrane Collaboration and the Quality of Reporting of Meta-analyses (QUORUM) guidelines [6,7]. Study heterogeneity was assessed using the chi-squared test with significance set at $P < 0.10$ and the I^2 statistic. If I^2 was $>50\%$, a random-effects (RE) model was used. Otherwise, a fixed-effects (FE) model was used [8]. Subgroup analyses were used to explore the sources of heterogeneity. Sensitivity analyses were performed by removing individual studies one at a time to assess the robustness of the results. The Newcastle–Ottawa Scale (NOS), with some modifications to match the needs of this study, was used to

評讀結果

優點:

1. 由兩位作者獨立評讀
2. 使用 QUADAS-2 tool評估試驗偏倚風險

■ Yes ☐ No ☐ Unclear



Validity

5. If the results of the review have been combined, was it reasonable to do so?
作者是否有把各個研究的結果合併起來？這樣的合併是合理的嗎？

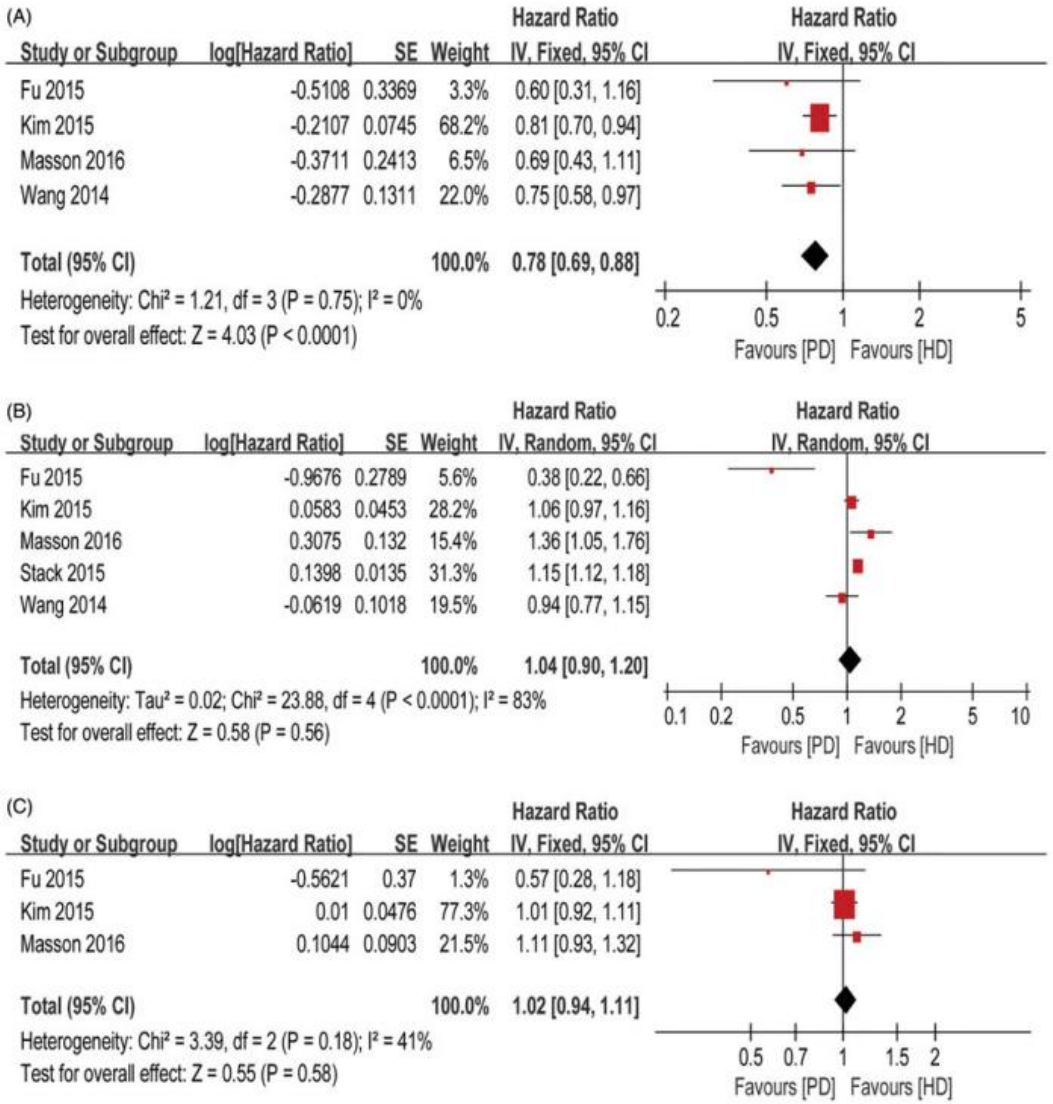


Figure 2. Meta-analysis of stroke risks comparing PD with HD: (A) hemorrhagic stroke; (B) ischemic stroke; and (C) overall stroke.

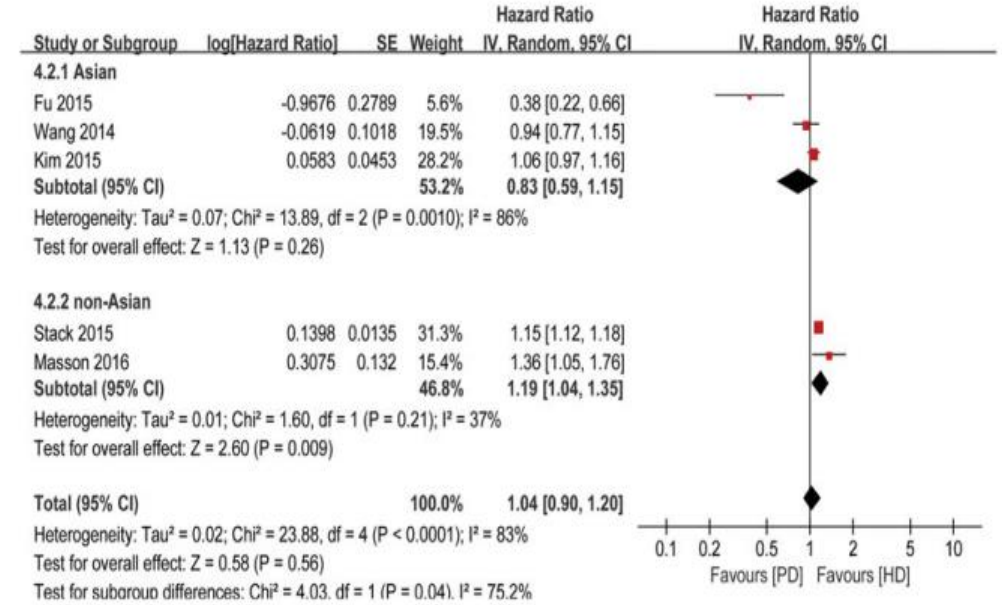


Figure 3. Subgroup analyses of ischemic stroke comparing PD with HD.

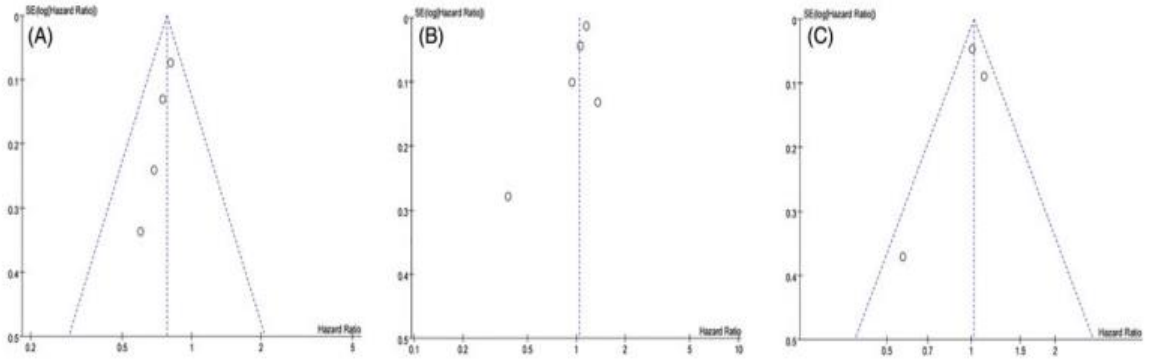
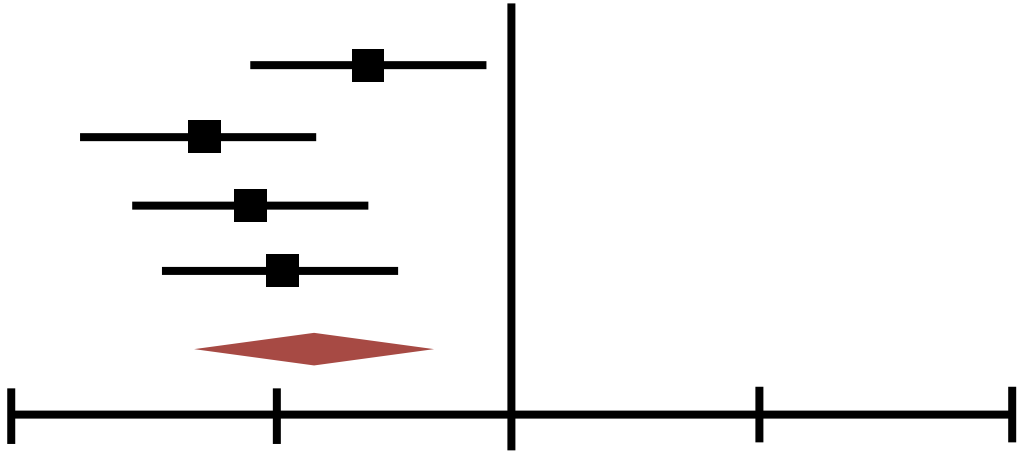


Figure 4. Funnel plots of (A) hemorrhagic stroke; (B) ischemic stroke; (C) overall stroke in our study.

高異質性，作者有使用次組群分析來檢驗

■ Yes ☐ No ☐ Unclear



Importance

6. What are the overall results of the review?

這篇回顧呈現了什麼結果？

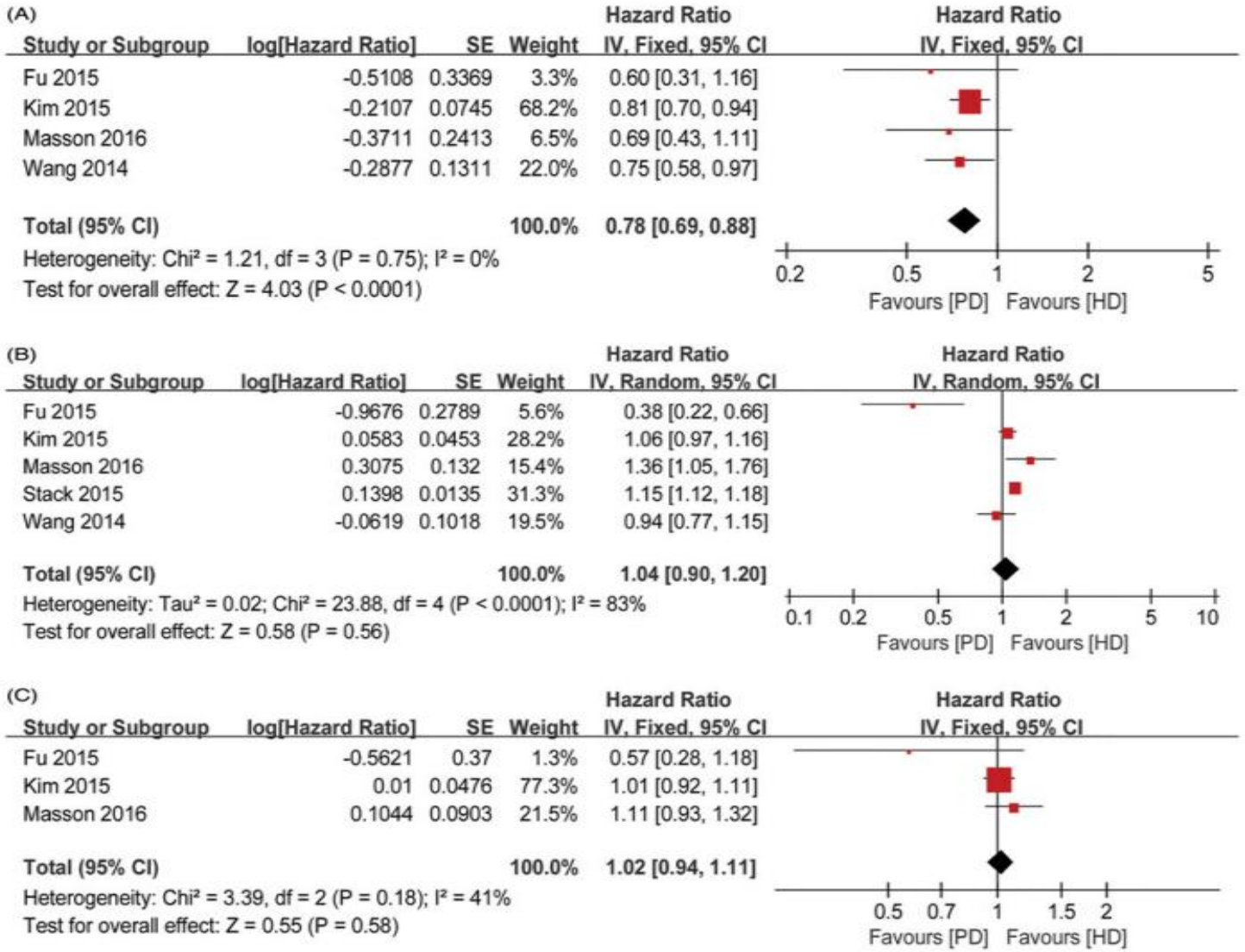


Figure 2. Meta-analysis of stroke risks comparing PD with HD: (A) hemorrhagic stroke; (B) ischemic stroke; and (C) overall stroke.

- 出血性中風的風險PD 比HD患者的少於為 **22%**
- 缺血性中風和全中風的風險沒有差異

■ Yes □ No □ Unclear

Importance

7. How precise are the results?
結果精準嗎？

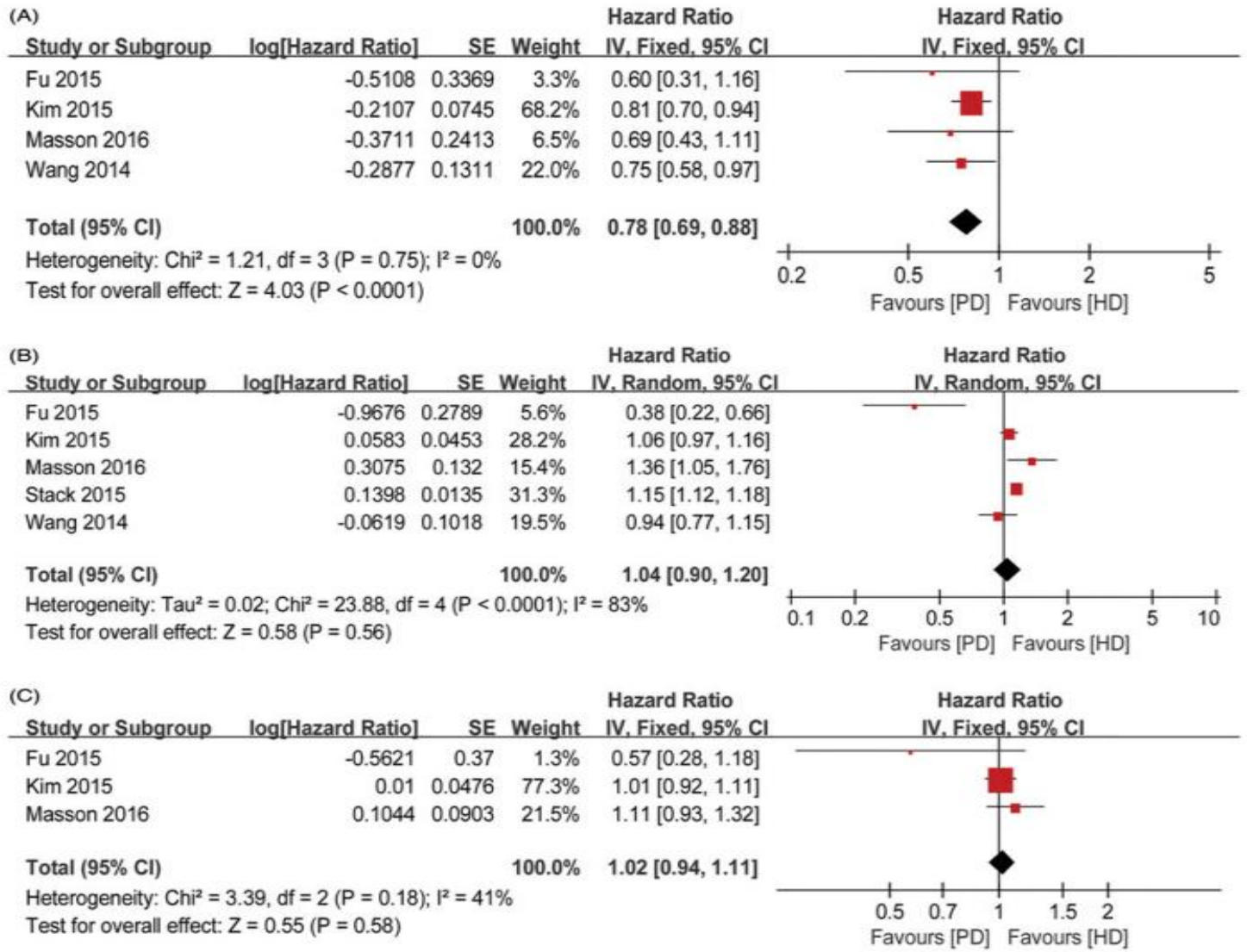


Figure 2. Meta-analysis of stroke risks comparing PD with HD: (A) hemorrhagic stroke; (B) ischemic stroke; and (C) overall stroke.

- 亞洲患者的 **PD** 和 **HD** 之間。沒有顯著差異

☐ Yes ☐ No ■ Unclear

評定證據等級-OCEBM Level of Evidence, 2011

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or "poor or non-independent reference standard**	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or *n*-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, *n*-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or *n*-of-1 trial	Randomized or (exceptio study with d			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized			-based

【問題】

經統合分析之系統性回顧文章

證據等級為 **Level 1**

※經嚴格評讀，無其他需要考慮降階理由

Practice

8. Can the results be applied to the local population?
   此研究是否可應用到你的病患？

評估適用性

	評讀文獻	臨床情境
P	end-stage renal disease	Diabetic Nephropathy
I	peritoneal dialysis (PD)	Peritoneal dialysis
C	Hemodialysis (HD)	Hemodialysis
O	stroke	Stroke

患者與文獻研究是否相似？ ☑年齡 ☑性別 ☑種族 ☑疾病嚴重度 ☑共病 ☐同時服用其他藥物治療	是

■ Yes ☐ No ☐ Unclear

Practice

9. Were all important outcomes considered?

是否所有重要的臨床結果都被考量到？

Table 1. Characteristics of included studies.

First author, year	Country	Design	No. of patients: PD/HD	Follow-up	Study quality (score)
Masson, 2016 [11]	Australia	Retrospective	3042/7422	3.8 (1.6–7.8)(m)[a]	★★★★★★★★
Kim, 2015 [2]	Korea	Retrospective	7387/22 892	21.5 (0–57)(m)[b]	★★★★★★
Fu, 2015 [12]	China	Prospective	305/285	32.5 (3–71.8)(m)[b]	★★★★★★★★
Stack, 2015 [13]	America	Retrospective	86 168/1,011,578	NA	★★★★
Wang, 2014 [3]	China	Retrospective	5974/74 192	HD: 4.2 ± 3.2 (y) [c] PD: 3.0 ± 2.3 (y) [c]	★★★★★★★

[a]Interquarter range.
[b]Range.
[c]Mean ± standard deviation.
m: month; y: year; NA: data not available

✓考量到多種異質性：像是性別、年齡、種族、都有列表討論

✓紀錄了PD和HD病人風險發生率的敏感性與異質性

■ Yes　□ No　□ Unclear

Practice

10. Are the benefits worth the harms and costs?
這些好處隨之而來的傷害和花費是否值得？

✓本篇未提及傷害

✓沒有進行正式的成本效益分析，因此無法做出經過驗證的陳述。

☐ Yes ■ No ☐ Unclear

醫病共享決策

實證醫學	患者期待
● 證據等級：CEBM(level 1)	降低中風的風險 不影響工作
利弊分析	**費用成本**
● PD比HD中風機率較低，PD行動自由	• 健保有給付

臨床應用-回覆病人問題

您好

根據文獻顯示， 血液透析與腹膜透析相比， 發生中風的風險
出血性中風風險, 腹膜透析比血液透析患者少 22%
缺血性中風和全中風的風險沒有差異

感謝各位評審聆聽