Candidate No: _____

The Hong Kong College of Anaesthesiologists

Final Fellowship Examinations

Paper II – Critical Appraisal

17 August 2022 (Wednesday)

11:30 – 12:20 hours

Article
"A systematic review with network meta-analysis on mono strategy of anaesthesia for preeclampsia in caesarean section" Cheng C et al (Scientific Reports 2021; 11: 5630)

1. **The study is a "network" meta-analysis, because:**
   A. it included studies from >2 countries.
   B. it included ≥2 types of trials/studies (e.g randomized controlled trials and prospective controlled studies).
   C. it included >2 endpoints (e.g mean arterial pressure, APGAR scores, vasopressor use, maternal adverse events…), where endpoints vary between trials and studies.
   D. it included studies that had >2 interventions where comparison vary between trials and studies.
   E. it included collaborative work from authors in >2 institutes or departments.

**2. In the result section, page 2, it says:**

> **Characteristics and quality of included studies.** The 11 RCTs and a prospective nonrandomized controlled trial recruited a total of 782 women with PE from Canada[29], India[21,22,32], Iran[26], the Republic of Macedonia[28], Russia[23–25], South Africa[8], Thailand[16], the United Kingdom[27], and the United States[13,30,31] between 1980 and 2015. The mean age of the women ranged from 18.8 to 32 years. Table 1 presents relevant information about maternal mean arterial pressure (MAP) at baseline, gestational age, and baby body weight; furthermore, Appendix 1 shows the quality of the RCTs and a prospective controlled study. These trials formed three-node network for primary outcomes (Fig. 2).

The "three-node" (highlighted in the box) refers to:
A. (1) general, (2) spinal, and (3) epidural anesthesia.
B. (1) maternal mean arterial pressure before delivery, (2) vasopressor use rate, and (3) neonatal 5 mins APGAR score.
C. (1) maternal intraoperative mean arterial pressure, (2) vasopressor consumption, and (3) neonatal 1 min APGAR score.
D. (1) maternal mean arterial pressure at baseline, (2) gestational age, and (3) baby body weight.
E. None of above.

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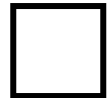
3. In the results section, page 5, Fig. 2, panel AB, this figure indicates that:

General

2 RCTs

Spinal

1 RCT

Epidural   **(B) Maternal intraoperative mean arterial pressure**
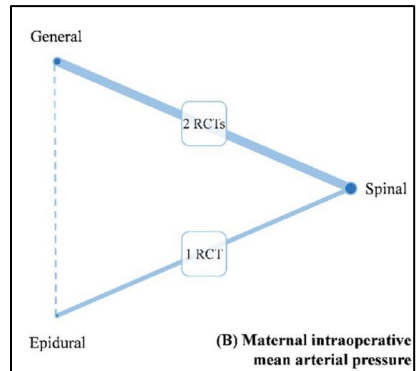
I.   the association between general and spinal anesthesia was higher than that between epidural and spinal anesthesia.
II. the was no association between general and epidural anesthesia.
III. general anesthesia produced higher maternal intraoperative mean arterial pressure than spinal anesthesia.
IV. heterogeneity in the comparison between general and epidural anesthesia was lower than other comparisons.

A. I only.
B. II only.
C. II and IV only.
D. I, II and III only.
E. None of the above.

4. In the results section, page 6, Fig. 3, panel A, this figure indicates that:

	(A) Maternal mean arterial pressure before delivery	
Comparison		**WMD with 95%CI**
General vs Spinal		4.38 (-26.26,35.02)
Epidural vs Spinal		21.04 (-9.54,51.63)
Epidural vs General		16.66 (-13.85,47.18)
	-50 -25 0 25 50	
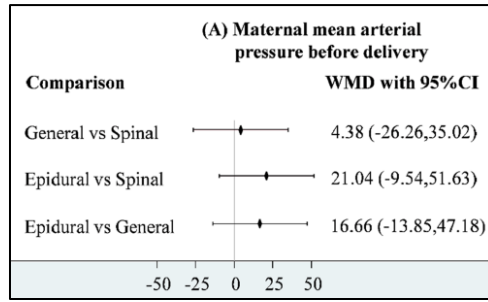
A. general anesthesia had higher maternal mean arterial pressure before delivery than spinal anesthesia by 4.38%.
B. epidural anesthesia had higher maternal mean arterial pressure before delivery than spinal anesthesia by 21.04 mmHg.
C. epidural anesthesia had higher maternal mean arterial pressure before delivery than general anesthesia by 16.66 mmHg.
D. the difference in maternal mean arterial pressure before delivery between epidural anesthesia and general anesthesia was 61.03%.
E. None of the above

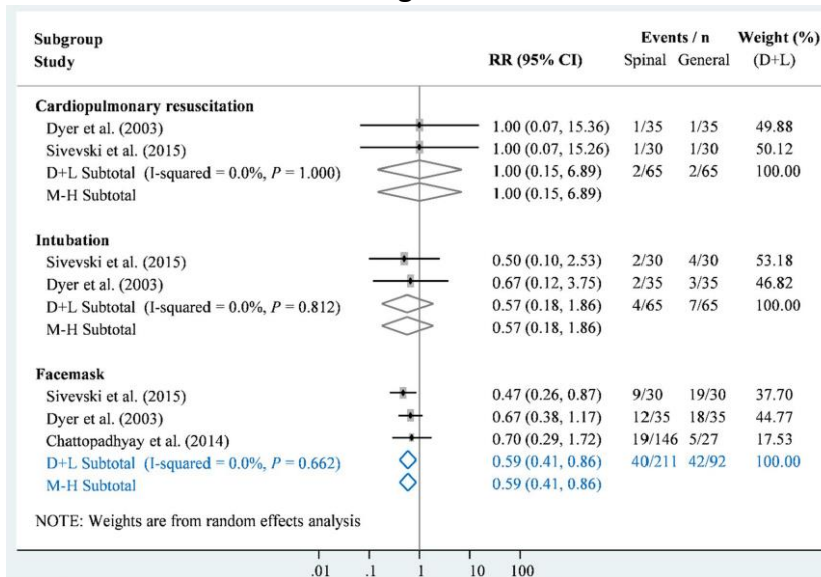5. **In Appendix 9 (Page 9 of the Appendix), the graph below was shown. Which of the following is correct?**
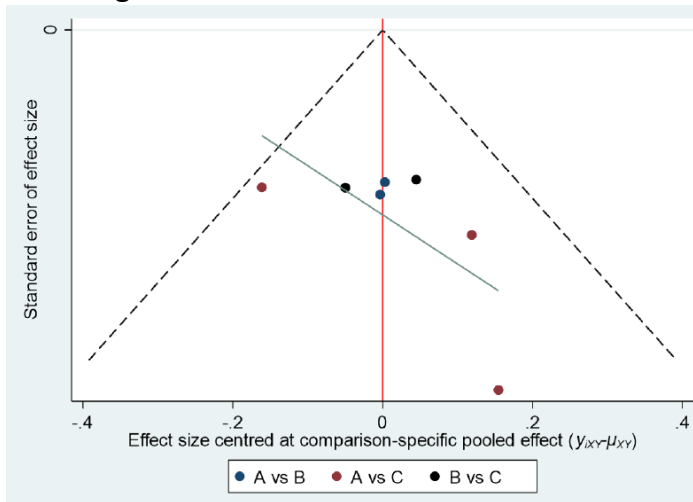
A   Study with larger sample size is generally located at the bottom of the plot.

B.   Study with larger effect is generally located at the left or right of the plot.

C.   The green line indicates the lower confidence limit for the effect size.

D.   The graph shows significant publication bias

E.   All of the above.

6. **Figure 4, page 7 shows the meta-analysis of neonatal resuscitation between spinal and general anesthesia. Which of the following is correct?**

Subgroup Study	RR (95% CI)	Events / n Spinal	General	Weight (%) (D+L)
Cardiopulmonary resuscitation				
Dyer et al. (2003)	1.00 (0.07, 15.36)	1/35	1/35	49.88
Sivevski et al. (2015)	1.00 (0.07, 15.26)	1/30	1/30	50.12
D+L Subtotal (I-squared = 0.0%, P = 1.000)	1.00 (0.15, 6.89)	2/65	2/65	100.00
M-H Subtotal	1.00 (0.15, 6.89)			
Intubation				
Sivevski et al. (2015)	0.50 (0.10, 2.53)	2/30	4/30	53.18
Dyer et al. (2003)	0.67 (0.12, 3.75)	2/35	3/35	46.82
D+L Subtotal (I-squared = 0.0%, P = 0.812)	0.57 (0.18, 1.86)	4/65	7/65	100.00
M-H Subtotal	0.57 (0.18, 1.86)			
Facemask				
Sivevski et al. (2015)	0.47 (0.26, 0.87)	9/30	19/30	37.70
Dyer et al. (2003)	0.67 (0.38, 1.17)	12/35	18/35	44.77
Chattopadhyay et al. (2014)	0.70 (0.29, 1.72)	19/146	5/27	17.53
D+L Subtotal (I-squared = 0.0%, P = 0.662)	0.59 (0.41, 0.86)	40/211	42/92	100.00
M-H Subtotal	0.59 (0.41, 0.86)			

NOTE: Weights are from random effects analysis

.01   .1   1   10   100

A. The risk of facemask ventilation for the neonates was lower with spinal anesthesia compared with general anesthesia.
B. Random effect analysis was done because of substantial heterogeneity of results.
C. The size (area) of the diamonds in the figure is a measure of sample size in each of the meta-analyses.
D. The horizontal scale is linear.
E. All of the above.
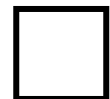
7. **In a systematic review, publication bias:**
   I. is due to publication of non-significant results.
   II. increases pooled effect size.
   III. is demonstrated by a Forest plot.
   IV. is due to publication of significant results.

   A. I only.
   B. II only.
   C. II and IV only.
   D. I, II and III only.
   E. None of the above.

8. In page 9, the following was shown.

Methods
In this study, we adhered to the Cochrane Handbook for Systematic Reviews of Interventions and the PRISMA guidelines for conducting and reporting meta-analyses[50,51]. Thus, the present study did not approach patients or any human. The answerable question for this study was structured according to the following PICO framework:

    <u>P</u>opulation: patients with PE who underwent CS.
    <u>I</u>ntervention: general anaesthesia.
    <u>C</u>omparison: SA or EA.
    <u>O</u>utcomes: maternal cardiovascular status; maternal adverse events; neonatal resuscitation; and APGAR score.

    To comprehensively understand the effects of anaesthesia strategies on patients with PE undergoing CS, we not only applied head-to-head meta-analysis but also constructed a contrast-based consistency model to pool quantitative data. Protocol of this study had been registered on PROSPERO before we initiated this synthesis in 2019, and the registry number is CRD42020152390.

With respect to PROSPERO, which of the following statement is **FALSE**?

A. it is an open access registry.
B. it is an international database of prospectively registered systematic reviews with a health related outcome.
C. it aims to avoid duplicated effort of similar work by other investigators.
D. it excludes registration for randomized controlled trials.
E. it is sponsored by Cochrane collaboration

----- **End of Paper** -----