2005 年至 2014 年間發表在主要麻醉學雜誌上的 META 分析的品質評價

Quality Assessment of Meta-analyses Published in Leading Anesthesiology Journals From 2005 to 2014

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在系統綜述出現之前，META 分析被認為是資料整合的"金標準"；然而，META 分析的品質常常是有問題的，這就導致所得結果的準確性得不到保證。本研究中，我們評估了從 2005 年到 2014 年期間發表在五個主要的麻醉學雜誌上的 META 分析的品質。研究中共納入了 220 篇發表在 Anesthesiology，Pain, British Journal of Anaesthesia, Anaesthesia, Anaesthesia & Analgesia 上的 META 分析。我們使用改良的多系統評價評估表（R-AMSTAR）來確定每篇 META 分析的品質。R-AMSTAR 就系統綜述及 META 分析相關的十一個問題用 1-4 的數字進行評價分級，其中 4 代表最高品質等級。所有的 META 分析品質都使用 Spearmen 回歸分析法進行評估，我們發現其與時間存在陽性相關性（r_s=0.24，P<0.001）。同樣，我們也發現了它們暫時的利益衝突關係（r_s=0.51，P<0.001）且它們損害了一系列的納入和排除的研究的利益（r_s=0.32，P<0.001）。總之，在過去十年間，發表在主要麻醉學雜誌上 META 分析的品質逐漸提高。另外，評估 META 分析中納入的研究的科學品質（P=0.60）以及使用這些評估方法所得出的結論和/或推薦仍然較低。（前者中位 R-AMSTAR 得分是 2，四分位差是 2-3；後者中位 R-AMSTAR 得分是 2，四分位差是 1-2）。

（胡翔翔譯 潘豔、薛張綱校）

Meta-analysis, when preceded by a systematic review, is considered the “gold standard” in data aggregation; however, the quality of meta-analyses is often questionable, leading to uncertainty about the accuracy of results. In this study, we evaluate the quality of meta-analyses published in 5 leading anesthesiology journals from 2005 to 2014. A total of 220 meta-analyses published in Anesthesiology, Pain, British Journal of Anaesthesia, Anaesthesia, or Anesthesia & Analgesia were identified for inclusion. The quality of each meta-analysis was determined using the Revised Assessment of Multiple Systematic Reviews (R-AMSTAR). R-AMSTAR rated 11 questions related to systematic reviews and meta-analyses on a scale of 1–4, with 4 representing the highest quality. Overall meta-analyses quality was evaluated using a Spearmen regression analysis and found to positively correlate with time ($rs = 0.24$, $P < .001$). Similarly, a temporal association was found for conflict of interest ($rs = 0.51$, $P < .001$) and comprised a list of included and excluded studies ($rs = 0.32$, $P < .001$). In conclusion, the quality of meta-analyses published in leading anesthesiology journals has increased over the last decade. Furthermore, assessing the scientific quality of included studies in meta-analyses ($P = .60$) and using this assessment to formulate conclusions and/or recommendations ($P = .67$) remains relatively low (median R-AMSTAR: 2, interquartile range [IQR]: 2–3]; median R-AMSTAR: 2, IQR: 1–2, respectively).

預防性使用噴他佐辛可減少在使用阿片類藥物的腰麻下行剖宮產術的術後瘙癢發生率：一項前瞻性隨機臨床試驗

Prophylactic Pentazocine Reduces the Incidence of Pruritus After Cesarean Delivery Under Spinal Anesthesia With Opioids: A Prospective Randomized Clinical Trial

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背景：腰麻時使用阿片類藥物分娩後瘙癢發生率高，範圍從50％到100％不等。 瘙癢難預防; 然而，已經證明噴他佐辛是一種有效的治療方法。儘管如此，還沒有確定噴他佐辛對瘙癢症的預防作用。這項隨機雙盲試驗旨在評估術中噴他佐辛在蛛網膜下腔給予阿片類藥物後最初24小時內對阿片類藥物誘發瘙癢發生率的影響。

方法：我們獲得機構審查委員會的批准和122名患者（美國麻醉醫師學會[ASA]身體狀況II;年齡（20-40歲）的書面知情同意書，並將這些計畫選擇性剖宮產分娩的產婦

納入本研究。用10mg，0.5％重比重布比卡因，10μg芬太尼和100μg嗎啡進行腰麻。嬰兒和胎盤分娩後，分娩患者隨機靜脈注射15 mg（1 mL）的噴他佐辛或1 mL生理鹽水。所有患者接受硬膜外輸注0.15％左布比卡因的術後鎮痛。記錄了鞘內注射阿片藥物後最初24小時內瘙癢的發生情況，並且在病房到達時也記錄了瘙癢的嚴重程度，疼痛的數值評分量表（NRS）和不良反應，以及鞘內注射阿片類藥物後3,6,12和24小時。

結果：共有患者119名完成了這項研究。 IV噴他佐辛與IV鹽水相比，在第一個24小時內總體瘙癢發生率降低，估計相對危險度為69％（95％置信區間[CI]，52％，90％; P = .007）。IV噴他佐辛也降低了瘙癢的嚴重程度。噁心嘔吐發生率和術後NRS評分差異都不大。

結論：分娩後單次在蛛網膜下腔中注射15mg劑量的噴他佐辛可以降低剖腹產術後患者的瘙癢發生率和嚴重程度。

（劉娟蘭譯 潘豔、薛張綱校）

BACKGROUND: The incidence of pruritus after cesarean delivery under spinal anesthesia with opioids is high, ranging from 50% to 100%. Pruritus is difficult to prevent; however, pentazocine has been shown to be an effective treatment. Despite this, the prophylactic effect of pentazocine on pruritus has not been defined. This randomized double-blind trial aimed to evaluate the effect of intraoperative IV pentazocine on the incidence of opioid-induced pruritus within the first 24 hours after administration of neuraxial opioids.

METHODS: We obtained institutional review board approval and written informed consent from the 122 patients (American Society of Anesthesiologists [ASA] physical status II; aged（20–40 years) scheduled for elective cesarean delivery who were included in this study. Spinal anesthesia was performed with 10 mg of 0.5% hyperbaric bupivacaine, 10 μg of fentanyl, and 100 μg of morphine. After delivery of the baby and placenta, the parturient women were randomized to intravenously receive 15 mg (1 mL)

of pentazocine or 1 mL of saline. All women received postoperative analgesia with the epidural infusion of 0.15% levobupivacaine. The
presence of pruritus within the first 24 hours after intrathecal administration of opioids was recorded, and severity of itch, numerical rating scale (NRS) for pain, and adverse effects were also recorded at the time of the arrival on the ward, as well as 3, 6, 12, and 24 hours after the intrathecal administration of opioids.
RESULTS: A total of 119 women completed the study. IV pentazocine reduced the overall incidence of pruritus within the first 24 hours compared to IV saline, with an estimated relative risk of 69% (95% confidence interval [CI], 52%, 90%; P = .007). IV pentazocine also reduced the severity of pruritus. The incidence of nausea and vomiting was not significantly different. There were no significant differences in postoperative NRS scores.
CONCLUSIONS: A single 15-mg dose of IV pentazocine after delivery can reduce both the incidence and severity of pruritus in women who have received subarachnoid opioids during cesarean delivery. (Anesth Analg 2017;XXX:00–00)

肋骨骨折患者的麻醉方案選擇：椎旁阻滯還是硬膜外麻醉？

Analgesic Choice in Management of Rib Fractures: Paravertebral Block or Epidural Analgesia?
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背景：肋骨骨折在創傷患者中很常見。本研究的目的是通過使用國家創傷資料庫（NTDB）評估肋骨骨折患者的臨床結局與硬膜外麻醉（EA）和椎旁神經阻滯（PVB）的聯繫。

方法：使用 2011 和 2012 版本的 NTDB，我們獲取了所有 18 歲以上肋骨骨折患者的資料。首要結局是住院期間死亡率。次要結局是住院時間（LOS）、ICU 入住率、ICU 入住時間、機械通氣、機械通氣時間、肺炎的發生、其他併發症的發生。臨床結局首先在傾向評分匹配的接受硬膜外麻醉和椎旁神經阻滯的患者中進行比較，然後，接受硬膜外麻醉和椎旁神經阻滯的患者合併為手術組，與傾向評分匹配的未接受任何操作的非手術組患者進行臨床結局比較。

結果：共有 194766 名患者納入研究，其中 1073 名患者接受了硬膜外麻醉，1110 名患者接受了椎旁神經阻滯，192583 名患者既未接受硬膜外麻醉，也未接受椎旁神經阻滯。在進行了傾向評分匹配後，接受硬膜外麻醉的患者與接受椎旁神經阻滯的患者在首要結局和次要結局上均無差別。而手術組患者比非手術組患者有更長的住院天數和更高的 ICU 入住率（二者均 p<.0001），而非手術組患者的死亡率有顯著增加（比值比：2.25；95%可信區間，1.14-3.84；p=.002）。

結論：通過使用 NTDB，接受硬膜外麻醉和椎旁神經阻滯的肋骨骨折患者無顯著差別。神經阻滯和更好的臨床結局有關，但這可以用接受神經阻滯的是更健康的患者來解釋。這個問題還需要進行進一步研究。

（劉雯珺譯 潘豔、薛張綱校）

BACKGROUND: Rib fractures are commonly encountered in the setting of trauma. The aim of this study was to assess the association between the clinical outcome of rib fracture and epidural analgesia (EA) versus paravertebral block (PVB) using the National Trauma Data Bank (NTDB).
METHODS: Using the 2011 and 2012 versions of the NTDB, we retrieved completed records for all patients above 18 years of age who were admitted with rib fractures. Primary outcome was in-hospital mortality. Secondary outcomes were length of stay (LOS), intensive care unit (ICU) admission, ICU LOS, mechanical ventilation, duration of mechanical ventilation, development of pneumonia, and development of any other complication. Clinical outcomes were first compared between propensity score-matched EA and PVB patients. Then, EA and PVB patients were combined into the procedure group and the outcomes were compared with propensity score-matched patients that received neither intervention (no-procedure group).
RESULTS: A total of 194,766 patients were included in the study with 1073 patients having EA, 1110 patients having PVB, and 192,583 patients having neither procedure. After propensity score matching, comparison of primary and secondary outcomes between EA and PVB patients showed no difference. Comparison of propensity score-matched procedure and no-procedure patients showed prolonged LOS and more frequent ICU admissions in patients receiving a procedure (both P < .0001), yet having no procedure was associated with a significantly increased odds of mortality (odds ratio: 2.25; 95% confidence interval, 1.14–3.84; P = .002).

CONCLUSIONS: Using the NTDB, EA and PVB were not found to be significantly different in management of rib fractures. There was an association between use of a block and improved outcome, but this could be explained by selection of healthier patients to receive a block. Prospective study of this association is recommended.

回顧性分析高滲鹽水的濃度對硬膜外粘連松解術的療效及安全性的影響

A Retrospective Study to Evaluate the Effect of Concentration of HypertonicSaline on Efficacy and Safety of Epidural Adhesiolysis.

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背景：經皮穿刺硬膜外粘連松解術（Percutaneous epidural adhesiolysis，PEA）是一種微創手術，用於緩解繼發於硬膜外粘連或瘢痕、經保守治療無效的腰背痛和/或下肢疼痛。高滲鹽水的最佳濃度可能是影響 PEA 安全性及療效的重要因素。在該回顧性研究中，我們將評估我院經腰椎間孔入路 PEA 中，硬膜外注射兩種不同濃度的高滲鹽水（5%和 10%）的安全性及療效差異。

方法：入選 2009 年 1 月至 2014 年 6 月就診我院行經腰椎間孔入路 PEA 的患者，根據術中硬膜外注射的鹽水的滲透壓分為 5%鹽水和 10%鹽水兩組。在術前及術後 6 個月應用 NRS 疼痛數位評估量表讓入選的兩組患者用 0-10 這 11 個數字描述腰腿痛的疼痛強度，記錄及分析手術前後疼痛程度的改變，並對比兩組患者間的差異。同時，隨訪並記錄術後 6 個月內硬膜外再注射次數，病人對手術的滿意度以及術後併發症。

結果：該研究共納入 543 例患者（5%鹽水組 333 例，10%鹽水組 210 例）。兩組患者 PEA 術後的 NRS 疼痛評分均顯著低於術前評分。10%鹽水組術後注射相關疼痛

評分高於 5%鹽水組，且存在臨界顯著性（P = 0.041）；除此之外，兩組患者在 PEA 術後 6 個月內的臨床特徵不存在顯著性差異。通過調整協變數（包括硬膜外再注射次數）進行多元回歸分析顯示，術後隨訪 6 個月 NRS 疼痛評分的降低與術中硬膜外注射的鹽水濃度不存在顯著相關性。3 例患者出現 PEA 相關短暫性不良反應（10%鹽水 2 例，5%鹽水組 1 例）。

結論：PEA 中硬膜外注射 5%高滲鹽水與注射 10%高滲鹽水相比，術後 6 個月的隨訪結果相似，且術後注射相關疼痛的發生率更低。這一結果表明，在經腰椎間孔入路 PEA 中，硬膜外注射 5%高滲鹽水可以替代 10%高滲鹽水。為了更好地觀察 PEA 中硬膜外注射不同濃度高滲鹽水的結果，還需進一步的前瞻性隨機對照研究。

（王雨婷譯潘豔、薛張綱校）

BACKGROUND: Percutaneous epidural adhesiolysis (PEA) is a minimally invasiveprocedurethat is performed to relieve low back and/or lower limb pain secondaryto adhesions or scarring in the epidural space that is refractory to conservativetreatment. The optimal concentration of hypertonic saline might be an importantfactor in the safety and efficacy of PEA. We evaluated differences in theefficacy and safety of 2 concentrations of hypertonic saline (5% and 10%) used inlumbar PEA at our institutions in a retrospective study.
METHODS: Patients who received lumbar PEA between January 2009 and June 2014 ateither of 2 large civilian teaching institutions in South Korea were assigned tothe 5% or 10% groups according to the osmolality of saline. The primary outcomeof this study was the difference in change in the 11-point numerical rating scale(NRS) scores of low back and leg pain from baseline to 6 months after PEA betweenpatients in the 2 groups. The number of additional epidural injections, patients'satisfaction with PEA, and any complications that occurred within 6 months afterPEA were reviewed.
RESULTS: This study included 543 patients (5% group, 333; 10% group, 210).Post-PEA NRS pain scores were significantly lower compared with those at baselinein both groups; however, there were no significant differences between the 2groups at 6 months or any time point after PEA with regard to any of the clinicalcharacteristics, except infusion-related pain, which exhibited borderlinesignificance for greater scores in the 10% group compared with those in the 5%group (P = .041). Multivariable linear regression analysis with adjustments

forcovariates, including the number of additional epidural injections, revealed nosignificant association between patient group and the decrease in NRS pain scoresat 6 months of follow-up. Transient adverse events related to PEA were recordedin 3 patients (10% group, 2; 5% group, 1).
CONCLUSIONS: In PEA, 5% hypertonic saline exhibited similar positive outcomesafter 6 months of follow-up as 10% hypertonic saline, with less infusion-relatedpain. This result suggests that infusion of 5% hypertonic saline may beconsidered as an alternative to 10% hypertonic saline in lumbar PEA. Furtherprospective randomized studies are required to better appreciate the outcome withregard to the use of different concentrations of hypertonic saline for PEA.

心臟手術中紅細胞輸血相關溶血：觀察佇列研究

Red Cell TransfusionAssociated Hemolysis in Cardiac Surgery: An Observational Cohort Study

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背景：儲存期間紅細胞活力受損，導致儲存期間和輸血後溶血過多。因此，輸血可能使血紅蛋白清除途徑過度飽和，導致易感患者出現游離血紅蛋白和鐵中毒，例如經心肺分流行心臟手術的患者。為了探討這一假設，我們評估了心臟手術病人紅細胞輸血與游離血紅蛋白和轉鐵蛋白飽和度關係的連續佇列。

方法：溶血實驗室檢查在連續心臟手術患者旁路術後 15～30 分鐘獲得。 構建控制重要混雜因數的多變數回歸模型，以確定旁路期間紅細胞輸血與游離血紅蛋白和轉鐵蛋白飽和度的獨立關係，分析為連續變數（線性回歸），並以第 90 百分位元數分類（邏輯回歸）。

結果：在 543 例患者中，82 例（15.1％）在旁路期間接受紅細胞輸血（中位數 1;四分位元數範圍 1-2 單位）。 所有患者均檢測到游離血紅蛋白（平均 11.3;標準差±9.3;第 90 百分位數 18MMOL/ L），轉鐵蛋白飽和度相對較高（平均 41±19％;第 90 百

分位數 66%）。 在控制混雜因素後，輸血與游離血紅蛋白無關（P> 0.25，線性回歸和邏輯回歸），但與轉鐵蛋白飽和度直接相關（線性和邏輯回歸中 P <0.001）。 輸血患者的轉鐵蛋白飽和度高（> 66%）的可能性為 6.2 倍（95%置信區間：2.4-16.1）風險調整增加。

結論：研究結果支援輸血相關不良事件可能部分由輸血紅細胞過度溶血引起的假說，這可能會導致急性鐵超載和相關毒性。 這表明旨在避免或減輕與輸血相關的急性鐵超載的策略可能會提高紅細胞輸血的安全性。

（吳靜怡譯 潘豔、薛張綱校）

BACKGROUND: Red cell viability is impaired during storage, resulting in excess hemolysis during storage and after transfusion. As a result, transfusions may oversaturate the hemoglobin clearance pathways, resulting in cell-free hemoglobin and iron toxicity in susceptible patients, such as those undergoing cardiac surgery with cardiopulmonary bypass. To explore this hypothesis, we assessed the relationship of red cell transfusions with cell-free hemoglobin and transferrin saturation levels in a consecutive cohort ofcardiac surgical patients.
METHODS: Laboratory measures of hemolysis were obtained in consecutive cardiac surgical patients 15 to 30 minutes after bypass. Multivariable regression models controlling for important confounders were constructed to determine the independent relationship ofred cell transfusions during bypass with cell-free hemoglobin and transferrin saturation levels post-bypass, analyzed as continuous variables (linear regression) and categorized at the 90th percentiles (logistic regression).
RESULTS: Of the 543 included patients, 82 (15.1%) received red cell transfusions during bypass (median 1; interquartile range 1-2 units). Cell-free hemoglobin was detected in all patients (mean 11.3; standard deviation ± 9.3; 90th percentile 18 μmol/L), and transferrin saturations were relatively high (mean 41 ± 19%; 90th percentile 66%). After controlling for confounders, transfusions were not associated with cell-free hemoglobin (P > .25 in linear and logistic regression) but were directly associated with transferrin saturation levels (P < .001 in linear and logistic regression). Transfused patients had a 6.2-fold (95% confidence interval: 2.4-16.1) risk-adjusted increase in the odds of having high (>66%) transferrin saturation levels.
CONCLUSIONS: The findings support the hypothesis that transfusion-related adverse events may be in part caused by the excessive hemolysis of transfused red cells, which can lead to acute iron overload and related toxicity. This suggests that strategies

aimed at avoiding or mitigating transfusion-related acute iron overload may improve the safety of red cell transfusion.

亞細胞能量代謝：跨物種框架

Subcellular Energetics and Metabolism: A Cross-Species Framework

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雖然人們普遍認為，氧化磷酸化和足夠的氧合作用對於生命來說至關重要，但是人類的發展發生在一個深度缺氧的環境中，並且胚胎發生過程中“正常”的氧水準甚至是有害的。通過適應於代謝途徑，胚胎不僅可以有能力存活，而且能夠在此環境中成長。同樣，癌細胞不僅能夠存活，而且能夠在通常導致健康成人細胞致死的環境中生長和擴散。許多生物學狀態，無論是正常還是病理狀態，都與代謝、電子傳遞鏈和反應物種有相似之處。本綜述第一部分的目的是回顧一些相似之處，包括胚胎發育，哺乳動物適應缺氧（主要由缺氧誘導因數-1 觸發），缺血再灌注損傷（及其與活性氧的關係），冬眠，潛水動物 ，癌症，敗血症，特別側重於細胞和生物體在這些狀態下生存的共同特徵。

（吳俊梅譯 潘豔、薛張綱校）

Although it is generally believed that oxidative phosphorylation and adequate oxygenation are essential for life, human development occurs in a profoundly hypoxic environment and “normal” levels of oxygen during embryogenesis are even harmful. The ability of embryos not only to survive but also to thrive in such an environment is made possible by adaptations related to metabolic pathways. Similarly, cancerous cells are able not only to survive but also to grow and spread in environments that would typically be fatal for healthy adult cells. Many biological states, both normal and pathological, share underlying similarities related to metabolism, the electron transport chain, and reactive species. The purpose of Part I of this review is to review the similarities among embryogenesis, mammalian adaptions to hypoxia (primarily driven by hypoxia-inducible factor-1), ischemia-reperfusion injury (and its relationship with reactive oxygen species),

hibernation, diving animals, cancer, and sepsis, with a particular focus on the common characteristics that allow cells and organisms to survive in these states.

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NR2B-CREB-miR212/132-CRTC1-CREB 網路信號在體內、外疼痛調控中的作用

The Role of NR2B-CREB-miR212/132-CRTC1-CREB Signal Network in Pain Regulation In Vitro and In Vivo.

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背景： 慢性疼痛對人類健康而言是一種令人逐漸衰弱的威脅，然而其分子機制仍尚未明確。既往研究已經表明：cAMP 作用原件結合蛋白（CREB）在疼痛調控中的有著關鍵性作用；CREB 調控的轉錄共啟動因數 1（CRTC1）和微小 RNA212/132 (miR212/132)在突觸可塑性中也是至關重要的。然而，人們對這些因素在疼痛發生時的相互作用是知之甚少。我們進行這項實驗的主要目的是為了明確 CREB、CRTC 和 miR212/132 在體外中的串擾。此外，我們探索了在慢性縮窄性損傷（CCI）的小鼠體內給予了 CREB 相關腺病毒載體，CRTC1 相關腺病毒載體和 miT212/312 鎖定核酸（LNA）時的痛覺過敏變化。

方法： 我們在小鼠胚胎脊髓中培養原代神經元。添加外源性谷氨酸來培養神經元，以便模擬體內疼痛過程。即時的，定量的聚合酶鏈反應被應用於測定 NR2B、CRTC1、CREB 和 miR212/132 在 mRNA 水準時的變化；蛋白質印跡用於檢測蛋白水準的 p-NR2B、p-CREB 和 CRTC1。Von Frey 纖毛被用於研究 CCI 的小鼠模型中的機械性痛覺過敏。鞘內注射 CREB-miR（干擾 CREB 基因的腺病毒載體），CREB-40（過度表達 CREB 基因的腺病毒載體）；CRTC1-miR（干擾 CRTC1 基因的腺病毒載體），CRTC1-AD（過度表達 CRTC1 基因），和 miR212/132-LNA。

結果： 在體內，100μmol/L 谷氨酸誘導 p-CREB 和 miR212/132-LNA.。CRTC1 蛋白受 CREB-miR 和 miR212/132-LNA 下調。CRTC1 mRNA 由 CREB-AD 上調，而被 CREB-miR 和 miR212-LNA 下調。P-CREB 由 CRTC1-AD 上調，被 miR212/132 下調。CREB mRNA 由 CRTC1-AD 上調，而被 CRTC1-miR 下調。MiR212/132 被 CRTC1-AD 和 CREB-AD 上調，而由 CREB-miR 下調。在體內，CRTC1-miR、CREB-miR 和 miR212/132-LNA 可以不同程度地提高機械刺激縮足反應閾值。

結論：NR2B-CREB-miR212/132-CRTC1-CREB 網路信號在疼痛調控中起著重要作用。干擾這個網路信號中的任何分子均會減輕疼痛感。

（張連芳譯 潘豔、薛張綱校）

BACKGROUND: Chronic pain is a debilitating threat to human health, and its molecular mechanism remains undefined. Previous studies have illustrated a key role of cAMP response element-binding protein (CREB) in pain regulation; CREB-regulated transcription coactivator 1 (CRTC1) and microRNA are also vital in synaptic plasticity. However, little is known about the interaction among these factors in pain condition. We conducted this experiment mainly to determine the crosstalk between CREB, CRTC1, and miR212/132 in vitro. Moreover, we explored the changes in hyperalgesia on chronic constrictive injury (CCI) mouse in vivo when given CREB-related adenovirus vectors, CRTC1-related adenovirus vectors, and miR212/132-locked nucleic acid (LNA).
METHODS: We cultured primary neurons in the spinal cord of mouse embryos. Exogenous glutamate was added to cultured neurons to simulate in vivo pain process. Real-time quantitative polymerase chain reaction was used to determine changes of NR2B, CRTC1, CREB, and miR212/132 at the mRNA level; Western blot was used to detect p-NR2B, p-CREB, and CRTC1 at protein level. Von Frey cilia were used to study mechanical hyperalgesia in a murine model of CCI. CREB-miR (adenovirus vector interfering CREB gene), CREB-AD (adenovirus vector overexpressing CREB gene); CRTC1-miR (adenovirus vector interfering CRTC1 gene), CRTC1-AD (adenovirus vector overexpressing CRTC1 gene), and miR212/132-LNA were injected intrathecally.
RESULTS: In vitro, 100 μmol/L glutamate induced p-CREB and miR212/132-LNA. CRTC1 protein was downregulated by CREB-miR and miR212/132-LNA. CRTC1 mRNA was upregulated by CREB-AD and downregulated by CREB-miR and miR212-LNA. P-CREB was upregulated by CRTC1-AD and downregulated by miR212/132. CREB mRNA was upregulated by CRTC1-AD and downregulated by

CRTC1-miR. MiR212/132 was upregulated by CRTC1-AD and CREB-AD; downregulated by CREB-miR. In vivo, CRTC1-miR, CREB-miR, and miR212/132-LNA increased paw withdrawal mechanical threshold in various degrees.
CONCLUSIONS: TheNR2B-CREB-miR212/132-CRTC1-CREB signal network plays an important role in the regulation of pain. Intervening with any molecule in this signal network would reduce pain perception.

一種口腔外科手術中的喉罩保護新方法

A Novel Way to Secure the Laryngeal Mask Airway During Oral Surgery Procedures.

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目前越來越多的手術已經成功開展了喉罩的應用。由於口腔外科手術需要在喉罩周圍進行操作，所以喉罩在該手術中的應用受到了限制。在本文的病例中，對一種新型的裝置——PROP 喉罩（喉罩支撐器）進行了研究，觀察其是否能夠保護第三臼齒拔除病例的喉罩位置。小型試驗研究結果顯示，這種新型的 PROP 喉罩可以使麻醉和手術均獲得滿意的結果。這種 PROP 喉罩可能成為臨床中一種新型有用的工具，在確保第三臼齒拔除的手術操作的同時可以充分保護喉罩以滿足麻醉維持的順利進行。

（趙明曄譯 潘豔、薛張綱校）

The laryngeal mask airway (LMA) has been used successfully for an ever-increasing number of applications. Utilization in oralmaxillofacial surgery has been hampered by surgical difficulties working around the device. In this case series, a novel device, the LMA-PROP, was used to determine whether it was possible to alleviate device-positioning concerns with third molar extraction cases. LMA-PROP was used with both anesthesia and surgical satisfaction in this small pilot study. LMA-PROP appears to be a helpful new tool allowing the surgeon to maintain current surgical

techniques for third molar extraction while securing LMA adequately for anesthesia maintenance.

在一個新的電子健康記錄模組實施之前，使用高科技模擬器為麻醉醫生準備:一份技術報告

Using High-Technology Simulators to Prepare Anesthesia Providers Before Implementation of a New Electronic Health Record Module: A Technical Report.

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學習新的電子麻醉資訊管理系統是很有挑戰性的。在一個不熟悉的系統中記錄麻醉事件、藥物管理和氣道管理，同時照顧病人的安全麻醉所需要的警惕性可能會分散注意力和風險。這個技術報告描述了在模擬的臨床場景中使用一個高科技的狂熱者訓練的一種與供應商無關的方法。培訓是可行的，並且受到參與者的重視，但需要結合電子和手動的元件。進一步的探索可以揭示模擬的病人護理訓練，它為參與者提供最大的利益，並提供回饋以告知電子健康記錄的改善。

（曹雨楓譯 潘豔、薛張綱校）

Learning to use a new electronic anesthesia information management system can be challenging. Documenting anesthetic events, medication administration, and airway management in an unfamiliar system while simultaneously caring for a patient with the vigilance required for safe anesthesia can be distracting and risky. This technical report describes a vendor-agnostic approach to training using a high-technology manikin in a simulated clinical scenario. Training was feasible and valued by participants but required a combination of electronic and manual components. Further exploration may reveal simulated patient care training that provides the greatest benefit to participants as well as feedback to inform electronic health record improvements.

心臟外科手術中的大量輸血：血液成分比例對臨床結局及生存率的影響

Massive Transfusion in Cardiac Surgery: The Impact of Blood Component Ratios on Clinical Outcomes and Survival

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背景：大量輸血在醫療發達地區多發生於心臟外科手術中。有關創傷後大量輸血的研究表明，所輸血液中血漿和血小板相較於紅細胞的比率影響死亡率。我們回顧性分析了一項大型隨機實驗 RECESS（研究行複雜心臟外科手術病人紅細胞儲存時間的影響）的資料，探究大量輸血病人所輸血液成分比例與臨床結局的關係。

方法：輸血超過六個單位紅細胞或者八單位血製品定義為大量輸血。高比率血漿定義為血漿單位比紅細胞單位大於 1；高比率血小板定義為輸注血製品中每一單位紅細胞含超過 0.2 治療劑量的血小板；一份機采血小板或 5 份全血血小板對等品為一個血小板治療劑量。結局為死亡或者多器官功能障礙評分在圍術期和死亡早期、出院及第七天最高得分之間的差值（△MODS）。比較輸注高比率血製品和低比例血製品患者的結局。應用線性方程及 Cox 回歸分析探究預測值和轉歸以及事件發生時間的關係。

結果：324 個病例符合大量輸血的標準。輸注高比率血漿的患者與輸注低比率血漿患者相比第七天和第 28 天平均△MODS 分別為 1.24（0.45）和 1.26（0.56），得分下降（P=.007 and P=.024）。輸注高比率血小板的患者相對而言第七天和第 28 天平均△MODS 分別為 1.55（0.53）和 1.49（0.65），得分下降（P=.004 and P=.022）。輸注低比率血漿的患者與輸注高比率血漿患者相比，7 天死亡率上升（7.2%vs1.7%，相比較，P=.0318）,28 天死亡率仍然有統計學意義（P=.035）。未發現輸注血製品的血小板與血漿比率與死亡率有關。

結論：分析發現，行複雜心臟外科手術並接受大量輸血的患者，所輸血製品成分比例與臨床結局有關。輸注高比率血製品（高比率血漿和高比率血小板）患者器官功能障礙更少；輸注高比率血漿患者死亡率更低。

（曹雪譯 潘豔、薛張綱校）

BACKGROUND: Cardiac surgery is the most common setting for massive transfusion in medically advanced countries. Studies of massive transfusion after injury suggest that the ratios of administered plasma and platelets (PLT) to red blood cells (RBCs) affect mortality. Data from the Red Cell Storage Duration Study (RECESS), a large randomized trial of the effect of RBC storage duration in patients undergoing complex cardiac surgery, were analyzed retrospectively to investigate the association between blood component ratios used in massively transfused patients and subsequent clinical outcomes.
METHODS: Massive transfusion was defined as those who had ≥6 RBC units or ≥8 total blood components.For plasma,high ratio was defined as ≥1 plasma unit:1RBC unit.For PLT transfusion,high ratio was defined as ≥0.2 PLT doses:1RBC unit;PLT dose was defined as 1 apherosis PLT or 5 whole blood PLT equivalents.The clinical outcomes analyzed were mortality and the change in the Multiple Organ Dyfunction Score(△MODS）comparing the perioperative score with the highest composite score through the earliest of death,discharge or day 7.Outcomes were compared between patients transfused with high and low ratios.Linear and Cox regression were used to esplore relationship between predicted and continuous outcomes and tome to event outcomes.
RESULTS: A total of 324 subjects met the definition of massive transfusion. In those receiving high plasma:RBC ratio, the mean (SE) 7- and 28-day ΔMODS was 1.24 (0.45) and 1.26 (0.56) points lower, (*P* = .007 and *P* = .024), respectively, than in patients receiving lower ratios. In patients receiving high PLT:RBC ratio, the mean (SE) 7- and 28-day ΔMODS were 1.55 (0.53) and 1.49 (0.65) points lower (*P* = .004 and *P* = .022), respectively. Subjects who received low-ratio plasma:RBC transfusion had excess 7-day mortality compared with those who received high ratio (7.2% vs 1.7%, respectively, *P* = .0318), which remained significant at 28 days (*P* = .035). The ratio of PLT:RBCs was not associated with differences in mortality.
CONCLUSIONS: This analysis found that in complex cardiac surgery patients who received massive transfusion, there was an association between the composition of blood products used and clinical outcomes. Specifically, there was less organ dysfunction in those who received high-ratio transfusions (plasma:RBCs and PLT:RBCs), and lower mortality in those who received high-ratio plasma:RBC transfusions.

1.心血管外科手術患者應用親血色蛋白：其伴有術後急性腎損傷的風險

Haptoglobin Administration in Cardiovascular Surgery Patients: Its Association With the Risk of Postoperative Acute Kidney Injury

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背景：急性腎損傷(AKI)通常發生在心臟手術後，在心臟手術中，血漿游離血紅蛋白(fHb)會由於溶血而增加，由於血漿 fHb 被認為是腎毒性的，因此，作為一種 fHb 的清道夫，可能有預防術後 AKI 的潛力。然而，很少有研究表明，治療與 AKI 發生率有關。

方法：本研究是一個觀察性的回顧性研究，以評估在心臟病人手術治療中，親血色蛋白的治療與 pAKI 的相關性。作者對 2008 年到 2015 年接受體外迴圈下的心臟手術患者進行了篩查。排除術前需要進行腎臟代替治療的患者。也排除了行降主動脈置換手術的患者。pAKI 根據 AKI 的網路標準。一個傾向評分——匹配的模型用於調整混雜因素。在敏感分析中，進行邏輯回歸模式分析。

結果：在這項研究中包括了 1326 名患者。在整個群體中，AKI 的發病率是 25.5%（333 例）。260 名患者(19.6%)接受了親血色蛋白治療。親血色蛋白治療患者中 AKI 的發生率為 24.6%，與沒有接受親血色蛋白的患者 AKI 發生率為 25.7%，發生率無顯著差異(P = .72; 優勢比, 0.94 [95% 可信區間, 0.69-1.29])。在傾向評分匹配後，每組有 249 名患者。在這以傾向評分中，與之相匹配的人群中，在親血色蛋白的病人中，AKI 的發病率是 22.5%，這明顯低於沒有結核珠蛋白的患者 30.9%的發病率(P = .033; 優

勢比, 0.65 [0.43-0.97])。在親血色蛋白治療組 pAKI 風險邏輯回歸分析顯示降低 AKI 風險獨立相關(P = .029; 調整優勢比 0.54 [0.31, 0.93])

結論：單中心、回顧性觀察研究顯示，在心血管手術中使用親血色蛋白與降低 AKI 的風險有關。

（朱碧君　譯　陳傑　校）

BACKGROUND: Acute kidney injury (AKI) often occurs after cardiac surgery. During cardiac surgery, plasma free hemoglobin (fHb) would increase due to hemolysis. Since plasma fHb is thought to be nephrotoxic, haptoglobin, which is an fHb scavenger, may have the potential to prevent postoperative AKI (pAKI). However, there have been few studies in which the association of intraoperative administration of haptoglobin with the incidence of AKI after cardiac surgery was assessed..

METHODS: This study was a retrospective observational study to assess the independent association of intraoperative administration of haptoglobin with the incidence pAKI in cardiac surgery patients. We screened cardiac surgery patients who required cardiopulmonary bypass from 2008 to 2015. We excluded patients who required renal replacement therapy preoperatively. We also excluded patients in whom descending aortic replacement was performed. pAKI was defined according to AKI Network criteria. A propensity score-matched model was used to adjust confounders. For sensitive analysis, we further developed a logistic regression model.

RESULTS: We included 1326 patients in this study. The incidence of AKI in the total cohort was 25.5% (338 patients). Haptoglobin was administered in 260 patients (19.6%). In the crude cohort, the incidence of AKI in patients with haptoglobin administration was 24.6%, which was not significantly different from the incidence of 25.7% in those without haptoglobin administration (P = .72; odds ratio, 0.94 [95% confidence interval, 0.69-1.29]). After propensity score matching, we had 249 patients in each group (for a total of 498 patients). In this propensity score-matched cohort, the incidence of AKI in patients with haptoglobin administration was 22.5%, which was significantly lower than the incidence of 30.9% in those without haptoglobin administration (P = .033; odds ratio, 0.65 [0.43-0.97]). In our logistic regression model for the risk of pAKI, haptoglobin administration was independently associated with decreased risk of AKI (P = .029; adjusted odds ratio, 0.54 [0.31, 0.93]).

CONCLUSIONS: In this hypothesis-generating, single-center retrospective observational study, intraoperative administration of haptoglobin was independently associated with lower risk of AKI after cardiovascular surgery.

2.河豚毒素、腎上腺素和化學滲透增強劑在外周神經阻滯中的聯合應用

Tetrodotoxin, Epinephrine, and Chemical Permeation Enhancer Combinations in Peripheral Nerve Blockade

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背景：化學滲透增強劑（CPE）具有通過作用於鈉通道阻斷劑如河豚毒素（TTX）的位點 1 而改善神經阻滯的潛力。作者使用 2 種 CPE（辛基硫酸鈉和辛基三甲基溴化銨）研究了 CPE 增強的神經阻斷在一系列 TTX 濃度下的功效和毒性。同時驗證假設，即 CPE 可以減少延長局部麻醉所需的 TTX 和/或輔助藥物（腎上腺素）的使用濃度。

方法：將含有或不含有腎上腺素的 TTX 和 CPE 合劑注射到 SD 大鼠的坐骨神經。使用改進的熱平板試驗和承重試驗分別評估感覺和運動神經阻滯。評估不同藥物聯合應用的全身及局部毒性。

結果：在 CPE 濃度固定的情況下，隨著 TTX 濃度增加呈現明顯的濃度依賴性的神經阻滯效果和神經阻滯的持續時間。 CPEs 對全身毒性沒有影響。 在某些濃度下，加入辛酸鈉可增加 TTX 加腎上腺素的神經阻滯的持續時間，腎上腺素能增加 TTX 加 CPE 阻滯的持續時間。腎上腺素的添加不會導致局部毒性的增加，且顯著降低全身毒性。

結論：CPEs 可以延長一定濃度範圍內 TTX 神經阻滯的持續時間。 CPEs 也可用於降低神經阻滯所需的腎上腺素濃度。CPEs 可用于增強鈉通道阻斷劑位點 1 的神經阻斷作用。

（陳依　譯　陳傑　校）

BACKGROUND: Chemical permeation enhancers (CPEs) have the potential to improve nerve blockade by site 1 sodium channel blockers such as tetrodotoxin (TTX). Here, we investigated the efficacy and toxicity of CPE-enhanced nerve blockade across a range of TTX concentrations using 2 CPEs (sodium octyl sulfate and octyltrimethyl ammonium bromide).

We also tested the hypothesis that CPEs could be used to reduce the concentrations of TTX and/or of a second adjuvant drug (in this case, epinephrine) needed to achieve prolonged local anesthesia

METHODS: Sprague-Dawley rats were injected at the sciatic nerve with combinations of TTX and CPEs, with and without epinephrine. Sensory and motor nerve blockade were assessed using a modified hot plate test and a weight-bearing test, respectively. Systemic and local toxicities of the different combinations were assessed.

RESULTS: Addition of increasing concentrations of TTX to fixed concentrations of CPEs produced a marked concentration-dependent improvement in the rate of successful nerve blocks and in nerve block duration. CPEs did not affect systemic toxicity. At some concentrations, the addition of sodium octyl sulfate increased the duration of block from TTX plus epinephrine, and epinephrine increased that from TTX plus CPEs. The addition of epinephrine did not cause an increase in local toxicity, and it markedly reduced systemic toxicity.

CONCLUSIONS: CPEs can prolong the duration of nerve blockade across a range of concentrations of TTX. CPEs could also be used to reduce the concentration of epinephrine needed to achieve a given degree of nerve block. CPEs may be useful in enhancing nerve blockade from site 1 sodium channel blockers.

3.動脈壓力和晶體液的消除速率

Arterial Pressure and the Rate of Elimination of Crystalloid Fluid

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在全麻過程中，晶體液的消除速率很緩慢。通過分析緩衝林格液的分佈與消除情況來確定其清除速率是否與血流動力學因素、意識、患者姿勢，全麻類型有關。資料來自於 4 個單獨發表的研究，30 名志願者和 48 個麻醉患者接受了 30min 的乳酸或醋酸林格液輸注，輸注速率 0.833mL/kg/min。利用微常數和混合效應建模軟體，對血液血紅蛋白和平均尿量進行了動態分析。結果表明，隨著平均動脈壓力(MAP)和患者年齡的增長，晶體液的消失率降低，但沒有受到意識、吸入或靜脈麻醉的影響。消除率常數是 6.5(95%置信區間，5.2-7.9) × 10(MAP/mean MAP) × (年齡/平均年齡)。2108 個資料的平均動脈壓是 81.3mmHg，平均年齡是 40 歲。由輸注液體(Vc、血漿容量)擴大的中央液體空間隨體重增加，但隨著全身麻醉和 MAP 的減少而減少。類比結果顯示，在 30min 的注射後，根據 MAP50 mm Hg 或 100 mm Hg 的大小，在排泄的液體體積上有超過 10 倍的差異。結論：晶體液的消除率隨 MAP 下降有所下降，但與全身麻醉和中等大小的手術無關。

（董璐　譯　陳傑　校）

Excretion of crystalloid fluid is slow during general anesthesia. The distribution and elimination of buffered Ringer's solution were analyzed to determine whether the rate of elimination correlates with a hemodynamic factor, consciousness, patient posture, or the type

of general anesthesia. Data were derived from 4 separately published studies in which 30 volunteers and 48 anesthetized patients had received 0.833 (1 series 0.667) mL/kg/min of lactated or acetated Ringer's solution over 30 minutes. Frequent measurements of the blood hemoglobin and mean urinary excretion were used as input in a kinetic analysis according to a 2-volume model and covariates, using microconstants and mixed-effects modeling software.The results show that rate of elimination of crystalloid fluid decreased with the mean arterial pressure (MAP) and patient age, but was unaffected by consciousness and inhalational or intravenous anesthesia. The elimination rate constant was 6.5 (95% confidence interval, 5.2-7.9) × 10 × (MAP/mean MAP) × (Age/mean Age). The mean MAP for the 2108 data points was 81.3 mm Hg and the mean age was 40 years. The central fluid space that was expanded by infused fluid (Vc, plasma volume) increased with body weight but decreased with general anesthesia and with reductions of MAP. Simulations revealed a more than 10-fold difference in the excreted fluid volume after a theoretical 30-minute infusion, depending on whether the MAP was 50 or 100 mm Hg. In conclusion, the rate of elimination of crystalloid fluid decreased in proportion to MAP but was independent of general anesthesia and moderate-sized surgery.

4.監測和改善術前評估品質

Measuring and Improving the Quality of Preprocedural Assessments

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背景：麻醉醫生通過術前評估為進行侵襲性操作的患者提供最佳的圍術期麻醉管理。當評估者不參與所評估患者的手術時，就增加了問題的複雜性，即評估者需滿足參與手術的麻醉醫生的需求。這篇文章通過麻醉醫生對評估者術前評估的分級來評估麻醉團隊滿意度。

方法：收集從 2014-1-9 到 2014-10-21 日的電子品質評估量表對麻醉評估者的術前評估進行品質評級。評級分為：非常滿意、滿意、不滿意三級。評級後面可添加任何文字說明。經過臨床麻醉培訓的專家可將評價分為積極的，保守或中性的。對於前 3 個月評價為保守的 67 個術前評估結果進一步分組，評價其不足之處。在 2017-5 月，麻醉醫生需參與中期調查問卷並提供術前評估的總體性回饋意見。

結果：分析了 37611 例需要麻醉的手術，其中 17522 (46.6%)例進行了術前評估的評級，3828 (21.8%)例非常滿意，13,454 (76.8%)例滿意，240 (1.4%)例不滿意。在研究期間，每個月的不滿意率範圍在 3.1%-0%。而中期調查問卷表明麻醉醫生估計的不滿意率為 11.5%。住院患者（入院前檢查機構）的不滿意率明顯低於門診患者（電話諮詢）（$P < .0001$）。最常見的不滿意原因是資訊缺失（49.2%）。病史回顧表明在術前評估中最常見的不足是文本資料不充分。（67 份評估中 35 份，52.2%）。

結論：逐例分級評估和中期調查表明在作者醫院絕大多數術前評估是滿意或非常滿意的。然而在不滿意的評估中總體概括性評估比逐例分級評估更糟糕。評價分析讓麻醉醫生可以對術前評估做出針對性的可行性的改進。其他醫療機構也可用此方法評價術前評估過程的系統性不足因素。

（戴依利　譯　陳傑　校）

BACKGROUND: Preproceduralassessmentsare used by anesthesia providers to optimize perioperative care for patients undergoing invasive procedures. When theseassessmentsare performed in advance by providers who are not caring for the patient during the procedure, there is an additional layer of complexity in ensuring that the workup meets the needs of the primary anesthesia care team. In this study, anesthesia providers were asked to rate thequalityofpreproceduralassessmentsprepared by other providers to evaluate anesthesia care team satisfaction.

METHODS: Qualityratings forpreproceduralassessmentswere collected from anesthesia providers on the day of surgery using an electronicqualityassurance tool from January 9, 2014 to October 21, 2014. Users could rateassessmentsas "exemplary," "satisfactory," or "unsatisfactory." Free text comments could be entered for any of thequalityratings chosen. A reviewer trained in clinical anesthesia categorized all comments as "positive," "constructive," or "neutral" and conducted in-depth chart reviews triggered by 67 "constructive" comments submitted during the first 3 months of data collection to further subcategorize perceived deficiencies in thepreproceduralassessments. In May 2014, providers were asked to participate in a midpoint survey and provide general feedback about thepreproceduralprocess and evaluations.

RESULTS: 37,611 procedures requiring anesthesia were analyzed. Of the 17,522 (46.6%) cases with a ratedpreproceduralassessment, anesthesia providers rated 3828 (21.8%) as

"exemplary," 13,454 (76.8%) as "satisfactory," and 240 (1.4%) as "unsatisfactory." The monthly proportion of "unsatisfactory" ratings ranged from 3.1% to 0% over the study period, whereas the midpoint survey showed that anesthesia providers estimated that the number of unsatisfactory evaluations was 11.5%.Preproceduralevaluations performed on inpatients received significantly better ratings than evaluations performed on outpatients by the preadmission testing clinic or phone program ($P < .0001$). The most common reason given for "unsatisfactory" ratings was a perception of "missing information" (49.2%). Chart reviews revealed that inadequate documentation was in reality the most common deficiency inpreproceduralevaluations (35 of 67 reviews, 52.2%).

CONCLUSIONS: The overwhelming majority ofpreproceduralassessmentsperformed at our institution were considered satisfactory or exemplary by day-of-surgery anesthesia providers. This was demonstrated by both the case-by-case ratings and midpoint survey. However, the perceived frequency of "unsatisfactory" evaluations was worse when providers were asked to reflect on thequalityofpreproceduralevaluations generally versus rate them individually. Analysis of comments left by providers allowed us to identify specific and actionable areas for improvement. This method can be used by other institutions to identify systemic deficiencies in thepreproceduralevaluation process.

5.重症監護室高磷血症和低磷血症佇列研究

Analysis of Hypo- and Hyperphosphatemia in an Intensive Care Unit Cohort

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背景：血磷水準容易受磷酸鹽水平變化而波動，往往被忽視。本文的目的是研究磷酸鹽水平是否和更高的 180 天總死亡率和發病率具有相關性。

方法：對 2006-2014 年 Skane 大學醫院成人重症監護室接受治療的 4656 名患者進行了回顧性研究，收集了 19467 份磷酸鹽數值，分為對照組和其餘 3 組：低磷血症組，高磷血症組，混合組（同時具有高磷血症和低磷血症組）。隨著時間推移，從進入 ICU 開始的 180 天內，按照性別、年齡、疾病嚴重程度，根據最大器官功能系統的序貫器官功能衰竭評分、腎臟序貫器官功能衰竭評分、最低鈣離子濃度進行診斷分類，採用 Cox 風險模型調整混雜因素。

結果：和血磷正常的對照組相比，高磷血症組具有更高的死亡率，危險比 1.2（98.3% 置信區間 1.0-1.5，P=.0089）。和對照組相比，低磷血症組和混合組死亡率無差異。和其他組相比，混合組機械通氣時間和 ICU 停留時間顯著延長。

結論：ICU 患者血磷水準改變很常見，且和更高的死亡率和發病率相關。很多潛在的病理生理機制發揮作用。臨床上應該立即糾正磷酸鹽水平快速的改變和獨立的低磷血症和高磷血症。

（傅丹雲　譯　陳傑　校）

BACKGROUND: Blood phosphate levels are vulnerable to fluctuations and changes in phosphate levels are often neglected. The aim of this study was to evaluate whether deviations in phosphate levels correlate to higher 180-day overall mortality or morbidity.

METHODS: Four thousand six hundred fifty-six patients with 19,467 phosphate values treated at the adult intensive care unit at Skåne University Hospital, Lund, Sweden during 2006-2014 were retrospectively divided into a control group and 3 study groups: hypophosphatemia, hypophosphatemia, and a mixed group showing bothhypo/hyperphosphatemia. Sex, age, disease severity represented by maximal organ system Sequential Organ Failure Assessment score, renal Sequential Organ Failure Assessment score, lowest ionized calcium value, and diagnoses classes were included in a Cox hazard model to adjust for confounding factors, with time to death in the first 180 days from the intensive care unit (ICU) admission as outcome.

RESULTS: When compared to normophosphatemic controls, the hyperphosphatemic study group was associated with higher risk of death with a hazard ratio of 1.2 (98.3% confidence interval 1.0-1.5, P = .0089). Mortality in the hypophosphatemic or mixed study group did not differ from controls. The mixed group showed markedly longer ventilator times and ICU stays compared to all other groups.

CONCLUSIONS: Phosphate alterations in ICU patients are common and associated with worse morbidity and mortality. Many underlying pathophysiologic mechanisms may play a role. A rapidly changing phosphate level or isolatedhypoorhyperphosphatemiashould be urgently corrected.

6.寨卡病毒：產科和兒科麻醉的注意事項

Zika Virus: Obstetric and Pediatric Anesthesia Considerations

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截至 2016 年 11 月，佛羅里達州衛生署(FDH)和疾病控制與預防中心已經證實，在美國有 4000 多起與旅行有關的寨卡病毒(ZIKV)感染，其中有 700 例在佛羅里達。目前已有 139 例局部感染病例，全部發生在佛羅里達州邁阿密。在美國領土內(如波多黎各，美國維爾京群島)，已經報告了 3 萬例 ZIKV 感染病例。在加勒比海和拉丁美洲的 ZIKV 感染風險的預計人數接近 500 萬。與登革熱和基孔肯雅病毒相似，ZIKV 通過感染雄性與雌性埃及伊蚊傳播給人類，通過與旅行有關的本地傳播，通過性接觸，以及通過輸血傳播。在美國，南佛羅里達是 ZIKV 感染的中心，全年溫暖的氣候以及大量的蚊子傳播媒介，這些病毒可以引起醫療保健方面的擔憂。ZIKV 感染一般是輕微的，臨床表現為發熱、皮疹、結膜炎和關節痛。然而，最令人擔憂的是，有越來越多的證據表明，懷孕婦女感染 ZIKV 病毒和新生兒異常妊娠和先天性異常的發生率增加，現在醫學上稱 ZIKA 病毒先天性綜合症。聯邦衛生官員正在觀察 899 個確認 Zika 病毒陽性懷孕的婦女和 FDH 目前正在監測 110 名患有寨卡病毒感染的孕婦。邁阿密大學/傑克遜紀念醫院位於邁阿密市區北部和自由城、小海地和邁阿密海灘附近，目前是寨卡病毒暴露和傳播的“熱點”。由於 FDH 的工作是為了防止寨卡病毒在該地區流行，邁阿密大學和傑克遜紀念醫院的衛生保健提供者為 ZIKV 的臨床症狀以及分娩者及其受影響的新生兒的安全圍手術期做好了準備。本綜述著重介

紹了從疾病控制和預防中心提出的臨時指導方針，並提出了麻醉的影響和建議，以滿足對可能的 ZIKA 病毒陽性患者的護理和出生時患有寨卡病毒的嬰兒的圍產期管理。此外，本文還對先天性 ZIKV 感染患兒的評價和麻醉管理進行了綜述。為了更好地管理受影響的新生兒的圍手術期護理，本文還回顧了與先天性畸形相關的嬰兒的相對麻醉影響。

（方洪偉　譯　陳傑　校）

As of November 2016, the Florida Department of Health (FDH) and the Centers for Disease Control and Prevention have confirmed more than 4000 travel-related Zika virus (ZIKV) infections in the United States with >700 of those in Florida. There have been 139 cases of locally acquired infection, all occurring in Miami, Florida. Within the US territories (eg, Puerto Rico, US Virgin Islands), >30,000 cases of ZIKV infection have been reported. The projected number of individuals at risk for ZIKV infection in the Caribbean and Latin America approximates 5 million. Similar to Dengue and Chikungunya viruses, ZIKV is spread to humans by infected Aedes aegypti mosquitoes, through travel-associated local transmission, via sexual contact, and through blood transfusions. South Florida is an epicenter for ZIKV infection in the United States and the year-round warm climate along with an abundance of mosquito vectors that can harbor the flavivirus raise health care concerns. ZIKV infection is generally mild with clinical manifestations of fever, rash, conjunctivitis, and arthralgia. Of greatest concern, however, is growing evidence for the relationship between ZIKV infection of pregnant women and increased incidence of abnormal pregnancies and congenital abnormalities in the newborn, now medically termed ZIKA Congenital Syndrome. Federal

health officials are observing 899 confirmed Zika-positive pregnancies and the FDH is currently monitoring 110 pregnant women with evidence of Zika infection. The University of Miami/Jackson Memorial Hospital is uniquely positioned just north of downtown Miami and within the vicinity of Liberty City, Little Haiti, and Miami Beach, which are currently "hot spots" for Zika virus exposure and transmissions. As the FDH works fervently to prevent a Zika epidemic in the region, health care providers at the University of Miami and Jackson Memorial Hospital prepare for the clinical spectrum of ZIKV effects as well as the safe perioperative care of the parturients and their affected newborns. In an effort to meet anesthetic preparedness for the care of potential Zika-positive patients and perinatal management of babies born with ZIKA Congenital Syndrome, this review highlights the interim guidelines from the Centers for Disease Control and Prevention and also suggest anesthetic implications and recommendations. In addition, this article reviews guidance for the evaluation and anesthetic management of infants with congenital ZIKV infection. To better manage the perioperative care of affected newborns, this article also reviews the comparative anesthetic implications of babies born with related congenital malformations.

7.進行電休克治療的患者的個體化麻醉管理：現行實踐回顧

Individualized Anesthetic Management for Patients Undergoing Electroconvulsive Therapy: A Review of Current Practice

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電休克治療（ECT）仍然是嚴重精神疾病不可或缺的治療方法。它在美國和世界各地廣泛使用，但麻醉醫師幾乎沒有與這種常規治療方法相關的指南。麻醉醫師和程式師之間的溝通對於 ECT 尤其重要，因為麻醉藥物的選擇和癲癇治療時生理後遺症的管理能夠直接影響治療的功效和安全性。 在本次綜述中，作者調查了關於 ECT 麻醉管理的文獻。 隨意的或“一刀切”的方法可能導致不太理想的結果; 制定每位患者的麻醉管理至關重要，可顯著提高治療成功率和患者滿意度。

（高浩 譯　陳傑　校）

Electroconvulsive therapy (ECT) remains an indispensable treatment for severe psychiatric illness. It is practiced extensively in the United States and around the world, yet there is little guidance for anesthesiologists involved with this common practice. Communication between the anesthesiologist and the proceduralist is particularly important for ECT, because the choice of anesthetic and management of physiologic sequelae of the therapeutic seizure can directly impact both the efficacy and safety of the treatment. In this review, we examine the literature on anesthetic management for ECT. A casual or "one-size-fits-all" approach may lead to less-than-optimal outcomes; customizing the anesthetic management for each patient is essential and can significantly increase treatment success rate and patient satisfaction.

8. 鎖骨上路臂叢神經阻滯時神經旁注射局麻藥複合右美托咪定比複合可樂定更有效：一項系統回顧和 Meta 分析

Perineural Dexmedetomidine Is More Effective Than Clonidine When Added to Local Anesthetic for Supraclavicular Brachial Plexus Block: A Systematic Review and Meta-analysis

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背景：可樂定是一種α-2 受體激動劑，長期被用作局部麻醉輔劑，具有延長末梢神經阻滯時間的功效。右美托咪定是一個新的α-2 受體激動劑，具有良好藥效學和安全特性，然而其作為輔劑與可樂定比較的資料存在爭議。作者試圖通過比較 2 種α-2 受體激動劑在上肢手術的外周神經阻滯特徵差異來評價兩者的臨床療效。

方法：初步搜索發現，絕大多數比較右美托咪定與可樂定在上肢手術中作用的隨機對照研究設定為鎖骨上路臂叢阻滯（SCB）。因此，作者對比較右美托咪定與可樂定作為輔劑神經旁單次注射 SCB 的隨機對照研究進行了系統性回顧和 Meta 分析。分析感覺和運動阻滯持續時間和起效時間、鎮痛時長、α-2 受體激動劑副作用及阻滯併發症。主要預後指標為感覺阻滯時間。資料結合使用隨機效應模型，並用均值比來分析結果。

結果：共納入 14 個臨床研究的 868 例患者進行分析。與可樂定相比，右美托咪定組感覺阻滯時間延長（均值比 [95% 置信區間 {CI}]） 為 1.2（1.2-1.3）；P<.00001）。其運動阻滯時間和鎮痛時間也延長（分別為 1.2 [1.1-1.3; P < .00001]；1.2 [1.1-1.3; P < .00001]）。該組加快感覺阻滯起效時間（0.9[0.8-1.0；P<.00001]）和運動阻滯起效時間(0.9[0.9-1.0；P=.002])。右美托咪定與短暫的心動過緩和術後鎮靜發生增加相關

（比值比[% CI]分別為： 7.4[1.3-40.8]；P=.003 和 11.8[1.9-73.6]; P=.0005）。其他α-2 受體激動劑相關副作用或阻滯相關併發症兩組無明顯性差異。

結論：與可樂定相比，作為一種 SCB 單次注射阻滯的局麻藥輔劑，神經旁給予右美托咪定能增強感覺、運動阻滯和鎮痛特性。這些收益應與短暫性心動過緩增加的風險相權衡。

（李東星　譯　陳傑　校）

BACKGROUND: Clonidine, an α-2 agonist, has long been used as a local anesthetic adjunct with proven efficacy to prolong peripheral nerve block duration. Dexmedetomidine, a newer α-2 agonist, has a more favorable pharmacodynamic and safety profile; however, data comparing its efficacy as an adjunct to that of clonidine are inconsistent. We sought to compare the clinical efficacy of these 2 α-2 agonists by examining their effects on peripheral nerve block characteristics for upper extremity surgery.

METHODS: A preliminary search found that the overwhelming majority of randomized controlled trials comparing perineural dexmedetomidine to clonidine for upper extremity surgery were in the setting of supraclavicular brachial plexus block (SCB). Therefore, we performed a systematic review and meta-analysis of randomized controlled trials comparing dexmedetomidine with clonidine as perineural adjuncts to single-injection SCB. Sensory and motor block duration and onset, analgesic duration, α-2 agonist side effects, and block

complications were analyzed. Sensory block duration was designated as a primary outcome. Data were combined using random-effects modeling, and ratio-of-means was used to analyze the results.

RESULTS: A total of 868 patients from 14 clinical studies were included in the analysis. Compared with clonidine, dexmedetomidine prolonged the duration (ratio of means [95% confidence interval {CI}]) of sensory block by an estimate of 1.2 (1.2-1.3; P< .00001). It also prolonged the duration (ratio of means [99% CI]) of motor block by an estimate of 1.2 (1.1-1.3; P < .00001), and analgesia by an estimate of 1.2 (1.1-1.3; P < .00001). It also hastened the onset of sensory block by an estimate of 0.9 (0.8-1.0; P < .00001) and motor block by an estimate of 0.9 (0.9-1.0; P = .002). Dexmedetomidine was associated with an increased odds ratio (99% CI) of transient bradycardia by an estimate of 7.4 (1.3-40.8; P = .003) and postoperative sedation by an estimate of 11.8 (1.9-73.6; P = .0005). There were no differences in other α-2 agonist-related side effects or block-related complications.

CONCLUSIONS: Compared with clonidine as a local anesthetic adjunct for single-injection SCB, perineural dexmedetomidine enhances sensory, motor, and analgesic block characteristics. These benefits should be weighed against the increased risk of transient bradycardia.

9.運動結合超聲波治療減弱大鼠神經病理性疼痛的機制與下調 IL-6 和 TNF-α 以及上調 IL-10 有關

Exercise Combined With Ultrasound Attenuates Neuropathic Pain in Rats Associated With Downregulation of IL-6 and TNF-, but With Upregulation of IL-10

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背景：儘管有證據表明超聲（TU）或平板運動（TE）對神經損傷相關性疼痛有治療效果，但是其分子機制仍不清楚。作者旨在探究 TU 和/或 TE 對坐骨神經慢性縮窄性損傷（CCI）誘發的神經病理性疼痛的作用，及其對促炎和抗炎細胞因數的影響。

方法：將大鼠隨機分組（每組 10 例），分為假手術組（sham）、CCI 術後進行 TU 空白處理組（CCI + TU0）、CCI 術後進行 TU 空白處理和 TE 處理組（CCI + TU0 + TE）、單純 CCI 手術組（CCI）、CCI 術後進行 TU 處理組（CCI + TU）、CCI 術後進行 TE 處理組（CCI + TE）、CCI 術後同時進行 TU 和 TE 處理組（CCI + TU + TE）。TU 和 TE 處理從術後第 8 天（POD8）開始，每天一次，持續 3 周。在 POD14 和 POD28 評估機械痛敏和熱痛敏，同時檢測坐骨神經中腫瘤壞死因數-α（TNF-α）、白細胞介素-10（IL-10）和 IL-6 的含量。重複測量的資料採用單因素、雙因素和三因素方差分析進行統計分析。

結果：干預後，所有評價指標在組間均有統計學意義（P≤0.0001），實驗組優勢明顯：機械痛縮爪閾值平均 4.2s（95%可信區間，1.8-7.6），熱痛撤爪時間平均 4.8s（95%置信區間，2.2-8.1）。TU 和/或 TE 處理明顯增加 CCI 大鼠的機械痛縮爪閾值和熱

痛撤爪時間。TU+TE 同時處理比單獨治療更能有效逆轉痛覺超敏反應。在 POD14 和 POD28，CCI 大鼠坐骨神經中 TNF-α 和 IL-6 的達均明顯上調，而 TU 或 TE 單獨處理或 TU+TE 同時應用可以逆轉以上兩種指標的上調。此外，結果顯示 TU 和/或 TE 處理組大鼠坐骨神經中 IL-10 的表達上調。

討論：通過本研究作者發現，TU+TE 同時應用優於 TU 或 TE 單獨治療神經性疼痛的效果。TU 和/或 TE 用於疼痛管理的機制可能與減少 TNF-α 和 IL-6 表達以及增加 IL-10 表達直接相關。

(邵甲雲　譯　陳傑　校)

BACKGROUND: Although there are several evidences that suggest efficacies of therapeutic ultrasound (TU) or treadmill exercise (TE) to alleviate nerve injury-associated pain, molecular mechanisms are less clear. We aimed to investigate the impact of TU and/or TE on neuropathic pain induced by chronic constriction injury (CCI) of the sciatic nerve and their roles of proinflammatory and anti-inflammatory cytokines.

METHODS: Rats were randomly divided into (n = 10 per group) sham operation (sham), CCI procedure followed by false application of TU (CCI + TU0), CCI procedure followed by false application of TU and TE (CCI + TU0 + TE), CCI, and CCI procedure followed by TU alone (CCI + TU), TE alone (CCI + TE), or both TU and TE (CCI + TU + TE) groups. TU and TE were administered daily, starting on postoperative day 8 (POD 8) for 3 weeks. Mechanical and thermal hypersensitivity, tumor necrosis factor-α (TNF-α), interleukin-10 (IL-10), and IL-6

in the sciatic nerve were assessed on PODs 14 and 28. Data were analyzed by 1-way, 2-way, or 3-way analysis of variance of repeated measures or 1-way analysis of variance.

RESULTS: After the interventions, there was statistical significance (all $P \leqslant .0001$) between the groups for all outcome parameters, all in favor of the experimental group: 4.2 for mean mechanical withdrawal thresholds (95% confidence interval, 1.8-7.6) and 4.8 for mean thermal withdrawal latencies (95% confidence interval, 2.2-8.1). TU and/or TE provoked an increase in mechanical withdrawal thresholds and thermal withdrawal latencies in CCI rats. TU + TE was more effective to reverse pain hypersensitivity than having each treatment alone. On PODs 14 and 28, the CCI rats exhibited an upregulation of sciatic TNF-α and IL-6 expression, whereas TU or TE alone or TU + TE combination prevented the upregulation. TU and/or TE also showed the upregulation of less IL-10 expression in the sciatic nerve.

DISCUSSION: We found that TU + TE is better than TU or TE alone for treating neuropathic pain. TU and/or TE for pain management may be straightly associated with less TNF-α and IL-6 expression and more IL-10 expression.

10.利多卡因能夠在間歇性牙周炎大鼠中抑制氧化應激引起的血管內皮功能障礙

Lidocaine Prevents Oxidative Stress-Induced Endothelial Dysfunction of the Systemic Artery in Rats With Intermittent Periodontal Inflammation

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背景：牙周炎能夠引起全身動脈系統血管內皮功能障礙。但是在牙科治療中使用局麻藥物是否對會牙周炎症以及血管內皮功能障礙起到抑制作用仍然不清。本研究旨在探索在脂多糖（LPS）引起的間歇性牙周炎大鼠中通過牙槽或全身給予利多卡因能否抑制氧化應激引起的血管內皮功能障礙。

方法：8-11 周齡的一些大鼠在一周內接受 1500μg LPS 牙槽內注射（LPS 組）。利多卡因（3 mg/kg），LPS+利多卡因(3 mg/kg)，LPS+利多卡因(1.5 mg/kg)和 LPS+利多卡因（3 mg/kg，腹腔內注射）組，同樣接受牙槽內 1.5 或 3mg/kg 或 3 mg/kg 腹腔內注射利多卡因。對大鼠主動脈和下頜骨進行組織學變化評估，血管環張力描記檢測，活性氧水準檢測和免疫印跡分析。

結果：對照組，LPS 組，LPS+利多卡因(3 mg/kg)和利多卡因組(3 mg/kg)組中平均壓和心率無明顯變化。注射 LPS 能夠顯著減少 ACh 引起的主動脈環舒張作用（在 Ach 3 × 10 mol/L 水準，29%的差異，P = .01）牙槽內注射利多卡因(1.5 and 3 mg/kg)能夠劑量依賴性的抑制 LPS 引起的內皮功能障礙（在 Ach 3 × 10 mol/L 水準，24.5%-31.1%的差異，P = .006 或.001）。與牙槽內注射相似，腹腔內注射 3 mg/kg 利多卡因能夠恢復 LPS 抑制的 ACh 產生的內皮細胞依賴性主動脈環舒張作用（在 Ach 3 × 10 mol/L 水準，27.5 的差異，P <.001）。在 LPS 組中活性氧水準成倍增加(P < .001)，但是使用聚乙二醇過氧化氫酶、牙槽內注射利多卡因(3 mg/kg)或聯合使用均能夠抑制活性氧水準的增加。LPS 能夠引起牙周組織中 TNF-α 增加 4 倍（P < .001），但是如果同時

給予利多卡因，能夠部分降低其水準。利多卡因也能夠降低 NADPH 氧化酶亞基 p47phox 的表達，而牙槽內注射 LPS 能夠使其 5-6 倍增加（$P < .001$）。

結論：利多卡因在牙周炎大鼠中通過對 NADPH 氧化酶和 TNF-α 引起的 ROS 水準抑制來保護血管內皮功能。研究結果顯示在牙周疾病的治療過程中進行局麻藥物使用或許能夠對血管內皮功能起到有益的作用。

（吳瑋　譯　陳傑　校）

BACKGROUND: Periodontal inflammation causes endothelial dysfunction of the systemic artery. However, it is unknown whether the use of local anesthetics during painful dental procedures alleviates periodontal inflammation and systemic endothelial function. This study was designed to examine whether the gingival or systemic injection of lidocaine prevents oxidative stress-induced endothelial dysfunction of the systemic artery in rats with intermittent periodontal inflammation caused by lipopolysaccharides (LPS).

METHODS: Some rats received 1500 μg LPS injections to the gingiva during a week interval from the age of 8 to 11 weeks (LPS group). Lidocaine (3 mg/kg), LPS + lidocaine (3 mg/kg), LPS + lidocaine (1.5 mg/kg), and LPS + lidocaine (3 mg/kg, IP) groups simultaneously received gingival 1.5 or 3 mg/kg or IP 3 mg/kg injection of lidocaine on the same schedule as the gingival LPS. Isolated aortas or mandibles were subjected to the evaluation of histopathologic change, isometric force recording, reactive oxygen species, and Western immunoblotting.

RESULTS: Mean blood pressure and heart rate did not differ among the control, LPS, LPS + lidocaine (3 mg/kg), and lidocaine (3 mg/kg) groups. LPS application reduced acetylcholine (ACh, 10 to 10 mol/L)-induced relaxation(29% difference at ACh 3 × 10 mol/L, P = .01), which was restored by catalase. Gingival lidocaine (1.5 and 3 mg/kg) dose dependently prevented the endothelial dysfunction caused by LPS application (24.5%-31.1% difference at ACh 3 × 10 mol/L, P = .006 or .001, respectively). Similar to the gingival application, the IP injection of lidocaine (3 mg/kg) restored the ACh-induced dilation of isolated aortas from rats with the LPS application (27.5% difference at ACh 3 × 10 mol/L, P < .001). Levels of reactive oxygen species were double in aortas from the LPS group (P < .001), whereas the increment was abolished by polyethylene glycol-catalase, gingival lidocaine (3 mg/kg), or the combination. The LPS induced a 4-fold increase in the protein expression of tumor necrosis factor-α in the periodontal tissue (P < .001), whereas the lidocaine (3 mg/kg) coadministration partly reduced the levels. Lidocaine application also decreased the protein expression of the nicotinamide adenine dinucleotide phosphate oxidase subunit p47phox, which was enhanced by the gingival LPS (5.6-fold increase; P < .001).

CONCLUSIONS: Lidocaine preserved the aortic endothelial function through a decrease in arterial reactive oxygen species produced by nicotinamide adenine dinucleotide phosphate oxidase and periodontal tumor necrosis factor-α levels in rats with periodontal inflammation. These results suggest the beneficial effect of the gingival application of local anesthetics on the treatment of periodontal diseases on endothelial function of systemic arteries.

一項關於在機器人根治性膀胱切除術中，一種無閥套管針對呼吸力學影響的前瞻性的、隨機的臨床試驗研究

A Prospective, Randomized, Clinical Trial on the Effects of a Valveless Trocar on Respiratory Mechanics During Robotic Radical Cystectomy: A Pilot Study

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背景：長時間的氣腹和特倫伯格體位在機器人輔助根治性膀胱切除術（RARC）中對於優化手術區域的視野是至關重要的，儘管它們對血流動力學和呼吸功能有不利影響。我們的假設是，使用一種無閥套管針(VT)可以改善呼吸系統。

方法：在這項前瞻性的、平行試驗中，將 ASAⅡ－Ⅲ、準備接受機器人根治性膀胱切除術的患者隨機分為 2 組：在 VT 組中，氣腹壓力由 VT 維持控制；在對照組中，氣腹由普通套管針維持（ST 組）。氣道平臺壓（Pplat）、肺靜態順應性（Cstat）、分鐘通氣量（MV）、潮氣量（Vt）、二氧化碳（CO_2）清除率都在這些時間裡記錄：麻醉誘導後的 15 分鐘（T0）、第一次與機器人對接後的 10 分鐘（T1）和 60 分鐘（T2）的，第一次分離後的 10 分鐘（T3）、第二次與機器人對接後的 10 分鐘（T4）和 60 分鐘（T5），第二次分離後的 10 分鐘（T6），拔管前 10 分鐘（T7）。該研究的主要目的是對 T1 到 T6 氣道平臺壓平均值的評估。

結果：一共對 56 例患者進行了評估：VT 組和 ST 組各 28 例。VT 組有較低的氣道平臺壓（均值和標準差，VT 組 30 [0.66]和 ST 組 34 [0.66] cm H_2O，估計平均值和 95%置信區間，-4.1[-5.9 到 -2.2],P <.01），較低的 MV（均值和標準差，VT 組 8.2 [0.22]與 ST 組 9.8 [0.21] L min，P<.01），較低的 CO2 清除率（均值和標準差，VT

組 4.2 [0.25]和 ST 組 5.4 [0.24] mL/kg min，P<.01），較低的呼氣末二氧化碳（ETCO2）（均值和標準差，VT 組 28.8 [0.48]與 ST 組 31.3 [0.46] mm Hg，P<.01），較高的肺順應性（均值和標準差，VT 組 26 [0.9]和 ST 組 22.1[0.9]mL cm H2O，P<.01）。這兩個組有相似的 Vt（P =.24）。

結論：在機器人根治性膀胱切除術中，使用無閥套管針與顯著降低的氣道平臺壓和其他呼吸機參數的改善有關。

（俞泳譯 李士通校）

BACKGROUND: Prolonged pneumoperitoneum and Trendelenburg positioning for robot-assisted radical cystectomy (RARC) are essential for optimizing visualization of the operative field, although they worsen hemodynamic and respiratory function. Our hypothesis is that the use of a valveless trocar (VT) may improve respiratory mechanics.

METHODS: *In this prospective, 2-arm parallel trial, patients ASA II to III undergoing RARC were randomly assigned into 2 groups: in the VT group, the capnoperitoneum was maintained with a VT; in the control group, the capnoperitoneum was maintained with a standardtrocar (ST group). Inspiratory plateau pressure (Pplat), static compliance (Cstat), minute volume (MV), tidal volume (Vt), and carbon dioxide (CO2) elimination rate were recorded at these times: 15 minutes after anesthesia induction (T0), 10 minutes (T1) and 60 minutes (T2) after first robot docking, 10 minutes before first undocking (T3), 10 minutes (T4) and 60 minutes (T5) after second docking, 10 minutes before second undocking (T6), and 10 minutes before extubation (T7). The primary end point of the study was the assessment of Pplat mean value from T1 to T6.*

RESULTS: *A total of 56 patients were evaluated: 28 patients in the VT group and 28 in the ST group. VT group had lower Pplat (means and standard error, VT group 30 [0.66] versus ST group 34 [0.66] cm H2O, with estimated mean difference and 95% confidence interval, -4.1 [-5.9 to -2.2], P < .01), lower MV (means and standard error, VT group 8.2 [0.22] versus ST group 9.8 [0.21] L min, P < .01), lower CO2 elimination rate (means and standard error, VT group 4.2 [0.25] versus ST group 5.4 [0.24] mL kg min, P < .01), lower end-tidal CO2 (ETCO2) (means and standard error, VT group 28.8 [0.48] versus ST group 31.3 [0.46] mm Hg, P < .01), and higher Cstat (means and standard error, VT group 26 [0.9] versus ST group 22.1 [0.9] mL cm H2O, P < .01). Both groups had similar Vt (P = .24).*

CONCLUSIONS: *During RARC, use of a VT was associated with a significantly lower Pplat and improvement in other respiratory parameters.*

吸入氧濃度對無創血紅蛋白測量的影響：2 台監測儀的並行性評估

Influence of Fraction of Inspired Oxygen on Noninvasive Hemoglobin Measurement: Parallel Assessment of 2 Monitors.

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背景：早前的報告已經對病人的氧合與使用光學感測器對血紅蛋白(Hb)的無創性測量準確度的關係進行了特別的關注。本研究的目的是，與傳統的微創性技術相比，使用兩種不同的無創性監測設備，前瞻性地評估吸入氧濃度(FIO_2)與 Hb 測量偏差之間的關係。

方法：按預期納入四十四名患者。在每個病例中，通過把探針放在病人同一只手的兩個手指上，通過無創性監測設備 Pronto-7（Masimo 公司、爾灣、CA）和（Orsense 公司、Petah Tikva、以色列）測定 Hb 水準。為此我們進行了三組處理，一組是呼吸空氣，其他兩組分別是氧濃度上升至 50%±5%和 90±5%。同時，一位護士採集靜脈血標本，並立即送往血液學實驗室進行 Hb 測量。主要結果指標是無創測量和有創測量之間的 NMB-200MP 平均偏差。

結果：結果顯示，當使用 Pronto-7 時，平均偏差[四分位範圍]沒有變化（從氧濃度 21%時的 1.1 g/dL [0.0-2.0]到氧濃度 100%時的 1.0 g/dL [0.2-1.5]），但使用 NMB-200MP 時，平均偏差隨氧濃度的升高而逐漸降低（從氧濃度 21%時的-0.3 g/dL [-1.3 to 0.3]到氧濃度 100%時的-0.8 g/dL [-1.5 to -0.1]，P = .04）。

討論：本研究表明，當使用監測設備 NMB-200MP 時，對 Hb 的無創性測定可能受到氧濃度的影響。

（俞泳譯 李士通校）

BACKGROUND: *Previous reports have brought specific attention to the relationship between oxygenation of the patient and the accuracy of noninvasive measurement of hemoglobin (Hb) using an optical sensor. This study aimed to assess prospectively the relationship betweenfraction of inspired oxygen (FIO2) and the bias of the measurement of Hb by the use of 2 differentnoninvasive monitors compared with the classic invasive technique.*

METHODS: *Forty-four patients were included prospectively. In each individual, Hb level was determined noninvasively by monitor Pronto-7™ (Masimo Corporation, Irvine, CA) and by monitor NBM-200MP™ (OrSense Ltd, Petah-Tikva, Israel), with the probe placed on 2 fingers on the same hand of the patient. Three measures were performed, first under breathing air and 2 others when fraction of expired oxygen rose to 50% ± 5% and to 90 ± 5%. Simultaneously, a nurse collected a venous blood sample, which was sent immediately to the hematology laboratory for Hbmeasurement. The main outcome measurement was the mean bias between noninvasive and invasive measurements.*

RESULTS: *Results show no change in median bias [interquartile range] with FIO2 for Pronto-7 (from 1.1 g/dL [0.0-2.0] in FIO2 21% to 1.0 g/dL [0.2-1.5] in FIO2 100%), but increasingly negative median bias with increasing FIO2 for NBM-200MP (from -0.3 g/dL [-1.3 to 0.3] in FIO2 21% to -0.8 g/dL [-1.5 to -0.1] in FIO2 100%, P = .04).*

DISCUSSION: *This study showed that noninvasive measurement of Hb could be influenced byinspired fraction of oxygen when the monitor NBM-200MP is used.*

比較重症監護室病人順行性和逆行性的外周靜脈置管：評估血栓的形成

Comparison Between Retrograde and Antegrade Peripheral Venous Cannulation in Intensive Care Unit Patients: Assessment of Thrombus Formation

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背景：*順行性的外周靜脈置管是慣例。導管和靜脈壁之間或在其尖端的血液瘀滯，除了靜脈炎之外，還可能會引發血栓形成。使用與血液流動的方向逆行性的腦室頸靜脈分流術減少靜脈血栓形成的發生率，這鼓勵我們比較了逆行和傳統的順行性周圍靜脈置管。*

方法：*單中心的非雙盲前瞻性觀察性佇列研究，40 個重症監護室的患者接收 2 個上肢的外周靜脈導管，1 個按血液流動的方向置入(順行性置管)，另外 1 個按血流流動相反的方向(逆行置管)。每日的超聲評估導管和血管壁之間的角度以檢測血栓形成的發生和發展。*

結論： *該研究納入 40 例患者，平均年齡為 46.7±10.132 歲。這兩種技術的血栓形成的發生率是 100% 。導管和血管牆之間血栓開始形成的時間，逆行置管者（四分位數間距(範圍))6 天 (5-6.75[4-8])和 95% 可信區間(CI) 5.58-6.42 天）明顯長於順行性置管 (四分位數間距(範圍))3 天 (3 - 4[2 - 5])和 95% 可信區間(2.76-3.24)天)，P 值<0.001。由超聲波測定的最近產生血栓到達導管尖端所需的時間，逆行性置管者（四分位數間距(範圍))9 天(8 - 9[7-10])，95% 可信區間（8.76-9.24）天）顯著長於順行性置管（四分位數間距(範圍))4 天(4-5[3-6])和 95% 可信區間 (3.76-4.24)天)，P 值<0.001。*

結果：*逆行置管沒有降低血栓形成的發生率，但相比傳統的順行性置管，顯著延長了血栓形成發病的時間及新形成的血栓到達導管尖端的時間。*

（吳昕菀譯 李士通校）

BACKGROUND: *Antegrade cannulation of peripheral veins is the usual practice. Blood stasis between a catheter and the wall of the vein or at its tip in addition to catheter-induced phlebitis may initiate a thrombosis. The use of retrograde ventriculojugular shunts against the direction of the blood flow with resultant decrease in the incidence of venous thrombosis encouraged us to compare retrograde versus conventional antegrade peripheral venous cannulation.*

METHODS: *Monocentric, nonblinded, prospective observational cohort of 40 intensive care unit patients receiving 2 peripheral venous catheters in upper limbs, 1 inserted in the direction of blood flow (antegrade cannula) and the other inserted in an opposite direction to blood flow (retrograde cannula). Daily ultrasound assessment of the angle between the catheter and the vascular wall was done to detect onset and progression of thrombus formation.*

RESULTS: *The study included 40 patients, aged 46.7 ± 10.132 years. The incidence of thrombus formation was 100% in both techniques. The onset time of thrombus formation between the catheter and the wall of a vein was significantly longer with the retrograde catheters than with the antegrade catheters with median time (interquartile range [range]) 6 days (5-6.75 [4-8]) with 95% confidence interval (CI), 5.58-6.42 vs 3 days (3-4 [2-5]) with 95% CI (2.76-3.24), respectively, with a P value <.001. The time needed by the recently detected thrombus to reach the catheter tip determined by ultrasound with or without catheter failure was significantly longer in the retrograde catheters than in the antegrade catheter with median time (interquartile range [range]) 9 days (8-9 [7-10]) with 95% CI, 8.76-9.24 vs 4 days (4-5 [3-6]) with 95% CI, 3.76-4.24, respectively, with a P value <.001.*

CONCLUSIONS: *Retrograde cannulation did not decrease the incidence of thrombus formation, but significantly increased the onset time until thrombus formation and prolonged the time needed by the newly formed thrombus to reach the catheter tip compared with conventional antegrade cannulation.*

應用 Web of Science 和 Scopus 資料庫分析困難氣道方面的產出、影響以及科學合作

Analysis of Production, Impact, and Scientific Collaboration on Difficult Airway Through the Web of Science and Scopus (1981-2013)

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背景： 文獻計量學，統計分析已出版的文章，是一個越來越受歡迎的科學活動的評估方法。文獻計量學幫助研究人員評估某個領域或研究的影響，已經被用來決定研究資金的資助。通過文獻計量分析，我們假設困難氣道研究的文獻計量分析研究將證明相關的文章和作者與日俱增。

方法：應用 Web of Science 和 Scopus 資料庫，我們搜索了從 1981 年 1 月至 2013 年 12 月間發表的關於困難氣道的文章。刪除重複的文章後，我們確定了 2412 篇文章。然後將這些文章作為一個群組來評估這個時期內的產出、科學協作和影響力。

結果：我們發現，在研究的時間段內，產出增加， 1981 年至 1990 年之間發表了 37 篇文章，2001 年和 2010 年之間發表了 1268 篇文章 ($P < 0.001$)。困難氣道研究論文增長速度比總的麻醉學相關論文快，自 1999 年，Web of Science 和 Scopus 資料庫中困難氣道相關文章的 CAGR(累積平均增長率)均大於 9%，而麻醉學作為一個整體，CAGR 在 Web of Science 上為 0.64%，在 Scopus 資料庫為 3.30%。此外，我們發現每位作者發表的論文數量和共同作者論文的數量之間存在正相關($P < 0.001$)。我們還發現共同作者發表的論文數量增加，機構間國際合作增加，每篇文章引用次

數也增加。我們也發現，對每一位作者而言，每篇文章的引用次數和發表論文的數量之間正相關($P < 0.001$)。

結論：隨著時間的發展，我們發現困難氣道相關論文比總的麻醉相關研究增加量更大。我們發現作者之間的合作會增加的影響力並且增加合作會增加引用率。用英語或在某些特定的期刊上出版，與某些特定的作者和機構合作，會增加這一領域文章發表的可見性。

（吳昕菀譯 李士通校）

BACKGROUND: Bibliometrics, the statistical analysis of written publications, is an increasingly popular approach to the assessment of scientific activity. Bibliometrics allows researchers to assess the impact of a field, or research area, and has been used to make decisions regarding research funding. Through bibliometric analysis, we hypothesized that a bibliometric analysis of difficult airway research would demonstrate a growth in authors and articles over time.

METHODS: *Using the Web of Science (WoS) and Scopus databases, we conducted a search of published manuscripts on the difficult airway from January 1981 to December 2013. After removal of duplicates, we identified 2412 articles. We then analyzed the articles as a group to assess indicators of productivity, collaboration, and impact over this time period.*

RESULTS: *We found an increase in productivity over the study period, with 37 manuscripts published between 1981 and 1990, and 1268 between 2001 and 2010 ($P < 0.001$). The difficult airway papers growth rate was bigger than that of anesthesiology research in general, with CAGR (cumulative average growth rate) since 1999 for difficult airway >9% for both WoS and Scopus, and CAGR for anesthesiology as a whole =0.64% in WoS, and =3.30% in Scopus. Furthermore, we found a positive correlation between the number of papers published per author and the number of coauthored manuscripts ($P < 0.001$). We also found an increase in the number of coauthored manuscripts, in international cooperation between institutions, and in the number of citations for each manuscript. For any author, we also identified a positive relationship between the number of citations per manuscript and the number of papers published ($P < 0.001$).*

CONCLUSIONS: *We found a greater increase over time in the number of difficult airway manuscripts than for anesthesiology research overall. We found that collaboration between authors increases their impact, and that an increase in collaboration increases citation rates. Publishing in English and in certain journals, and collaborating with certain authors and institutions, increases the visibility of manuscripts published on this subject.*

剖宮產的麻醉方式選擇：一項來自國家臨床麻醉結果登記的分析

Choice of Anesthesia for Cesarean Delivery: An Analysis of the National Anesthesia Clinical Outcomes Registry

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Anesthesia & Analgesia: 2017 124 1914–1917

區域麻醉應用于剖宮產開始增長於 20 世紀 80 年代，反之全麻的使用率開始下降。在這篇簡要報告中，我們使用了國家臨床麻醉結果登記資料分析了最近產科麻醉的實施模式。在 2010 年至 2015 年間，約有 218285 例剖宮產病人進行登記。在所有剖宮產中，全麻占了 5.8%，而在緊急剖宮產中全麻占了 14.6%。在大學附屬醫院、下班後及週末這段時間、以及產婦 ASA 分級 III 級及以上、或者產婦年齡小於等於 18 歲這群人中，剖宮產的全麻率較高。

（廖汝婷譯 李士通校）

Neuraxial anesthesia use in cesarean deliveries (CDs) has been rising since the 1980s, whereas general anesthesia (GA) use has been declining. In this brief report we analyzed recent obstetric anesthesia practice patterns using National Anesthesiology Clinical Outcomes Registry data. Approximately 218,285 CD cases were identified between 2010 and 2015. GA was used in 5.8% of all CDs and 14.6% of emergent CDs. Higher rates of GA use were observed in CDs performed in university hospitals, after hours and on weekends, and on patients who were American Society of Anesthesiologists class III or higher and 18 years of age or younger.

聽覺或胸廓阻抗技術用於有呼吸抑制風險的患兒術後呼吸功能的監測的比較

Comparison of Postoperative Respiratory Monitoring by Acoustic and Transthoracic Impedance Technologies in Pediatric Patients at Risk of Respiratory Depression

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Anesthesia & Analgesia: 2017 124 1937–1942

背景：運用胸廓阻抗技術(TI)、二氧化碳濃度測量以及手工法計數對小兒進行術後呼吸頻率的監測有局限性。彩虹聲學監測（RAM）能通過不同的方法持續監測呼吸頻率。我們的主要目的是比較 RAM 及 TI 計數方法與手工計數方法的一致性與準確性。再者比較其耐受性及對報警事件的分析。

方法:本實驗收集了62名行扁桃體切除術及進行術後患者自控鎮痛的2~16歲兒童。通過 RAM，TI 及手工計數每隔一段時間對呼吸頻率進行測量。每次 RAM 及 TI 報警都將進行臨床評價以區分是否正確。為了評價 RAM 及 TI 計數方法與手工計數方法是否一致及準確，我們使用 Bland-Altman 分析來顯示均差及一致性範圍。並對 RAM 及 TI 呼吸頻率報警的敏感性及特異性進行分析。

結果：收集的 58 名扁桃體摘除術後兒童及 4 名患者術後自控鎮痛使用者中，年齡為 6.5 ± 3.4 歲，體重為 35.3 ± 22.7 kg（BMI 為 76.6 ± 30.8）。平均每位患者監測時間為 15.9 ± 4.8 小時。在總的監測過程中 RAM 的耐受性為 87%。TI 與手工計數顯著不同(P = .007)，平均差±標準差為 1.39 ± 10.6；但 RAM 與手工計數相比卻沒有明顯不同(P = .81)，平均差±標準差為 0.17 ± 6.8。在所有測量呼吸頻率的時間差異大於 4 次呼吸中，TI 占了 22%,RAM 占了 11%。總共檢測到 276 次報警（平均每位病人占 4.5 次）。RAM 中平均每位病人的報警次數為 1.58 ± 2.49 次，TI 為 2.87 ± 4.32 次。RAM 的平均錯誤報警次數為 0.18 ± 0.71 次，TI 為 1.00 ± 2.78 次。RAM 敏感性為 46.6% (95% 置信區間 [CI]為 0.29-0.64)，特異性為 95.9% (95% CI 為 0.90-1.00)， 陽性預測值為 88.9% (95% CI, 0.73-1.00)， 陰性預測值為 72.1% (95% CI, 0.61-0.84)，然而 TI 監測的敏感性為 68.5% (95% CI, 0.53-0.84)，特異性為 72.0% (95% CI, 0.60-0.84)， 陽性預測值為 59.0% (95% CI, 0.44-0.74)， 陰性預測值為 79.5% (95% CI, 0.69-0.90)。

結論：在對術後有呼吸抑制風險患兒的呼吸頻率監測當中，RAM 監測技術與手工計數無明顯不同。與 TI 相比，RAM 技術有更好的耐受性及更低的假報警發生率，

且有更好的特異性及陽性預測值。陰性預測值的嚴格評估對 RAM 的術後呼吸監測有著非常重要的作用。

（廖汝婷譯 李士通校）

BACKGROUND：In children, postoperative respiratory rate (RR) monitoring by transthoracic impedance (TI), capnography, and manual counting has limitations. The rainbow acoustic monitor (RAM) measures continuous RR noninvasively by a different methodology. Our primary aim was to compare the degree of agreement and accuracy of RR measurements as determined by RAM and TI to that of manual counting. Secondary aims include tolerance and analysis of alarm events.
METHODS: Sixty-two children (2-16 years old) were admitted after tonsillectomy or receiving postoperative patient/parental-controlled analgesia. RR was measured at regular intervals by RAM, TI, and manual count. Each TI or RAM alarm resulted in a clinical evaluation to categorize as a true or false alarm. To assess accuracy and degree of agreement of RR measured by RAM or TI compared with manual counting, a Bland-Altman analysis was utilized showing the average difference and the limits of agreement. Sensitivity and specificity of RR alarms by TI and RAM are presented.
RESULTS: Fifty-eight posttonsillectomy children and 4 patient/parental-controlled analgesia users aged 6.5 ± 3.4 years and weighting 35.3 ± 22.7 kg (body mass index percentile 76.6 ± 30.8) were included. The average monitoring time per patient was 15.9 ± 4.8 hours. RAM was tolerated 87% of the total monitoring time. The manual RR count was significantly different from TI (P = .007) with an average difference ± SD of 1.39 ± 10.6 but were not significantly different from RAM (P = .81) with an average difference ± SD of 0.17 ± 6.8. The proportion of time when RR measurements differed by ≥4 breaths was 22% by TI and was 11% by RAM. Overall, 276 alarms were detected (mean alarms/patient = 4.5). The mean number of alarms per patient were 1.58 ± 2.49 and 2.87 ± 4.32 for RAM and TI, respectively. The mean number of false alarms was 0.18 ± 0.71 for RAM and 1.00 ± 2.78 for TI. The RAM was found to have 46.6% sensitivity (95% confidence interval [CI], 0.29-0.64), 95.9% specificity (95% CI, 0.90-1.00), 88.9% positive predictive value (95% CI, 0.73-1.00), and 72.1% negative predictive value (95% CI, 0.61-0.84), whereas the TI monitor had 68.5% sensitivity (95% CI, 0.53-0.84), 72.0% specificity (95% CI, 0.60-0.84), 59.0% positive (95% CI, 0.44-0.74), and 79.5% negative predictive value (95% CI, 0.69-0.90).
CONCLUSIONS: In children at risk of postoperative respiratory depression, RR assessment by RAM was not different to manual counting. RAM was well tolerated, had a lower incidence of false alarms, and had better specificity and positive predictive value than TI. Rigorous evaluation of the negative predictive value is essential to determine the role of postoperative respiratory monitoring with RAM.

帕瑞昔布用於補充嗎啡鎮痛減少老年患者髖關節/膝關節置換術後譫妄發生率：一項隨機對照試驗

Parecoxib Supplementation to Morphine Analgesia Decreases Incidence of Delirium in Elderly Patients After Hip or Knee Replacement Surgery: A Randomized Controlled Trial

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Anesthesia & Analgesia: 2017 124 1992–2000

背景：嚴重的疼痛和高劑量的阿片類藥物用量均會增加患者術後譫妄的風險。作者研究了使用帕瑞昔布來減少靜脈嗎啡鎮痛用量，是否可以降低老年患者全髖/全膝關節置換術後譫妄的發生率。

方法：在一項隨機、雙盲、雙中心的試驗中， 60 歲以上擇期行全髖或膝關節置換術的老年患者以 1:1 的比例隨機分為兩組，一組手術結束後給予帕瑞昔布 40mg，且術後 3 天每 12 小時追加一次，另一組患者則以相同方式給予安慰劑（生理鹽水）。所有患者術中均採取腰硬聯合麻醉，術後使用嗎啡鎮痛。本研究主要觀察結果是患者術後 5 天內譫妄的發生率。

結果：在 2011 年 1 月至 2013 年 5 月間，共計 620 名患者納入本次試驗及安全性分析。與安慰劑組譫妄發生率的 11%（34 / 310）相比，帕瑞昔布譫妄的發生率顯著降低，為 6.2%（19 / 310），其中相對危險度 0.56，95%置信區間 0.33-0.96，P =0. 031。帕瑞昔布組患者術後 24，48 和 72 小時疼痛的嚴重程度及嗎啡累積消耗量，顯著低於安慰劑組（P 均＜0.001），但兩組患者差異並不大。在術後併發症發生率方面，

兩組患者之間沒有差異(安慰劑組 12.3% [38 / 310]；帕瑞昔布組 11.6% [36 / 310]；P = 0.80）。

結論：對於低風險的擇期行全髖或全膝關節置換術的老年患者，使用帕瑞昔布鈉以減少靜脈嗎啡用量，可降低患者術後譫妄的發生率，且不增加不良事件的發生率。

（陸曉斐譯 李士通校）

BACKGROUND: Severe pain and high-dose opioids are both associated with increased risk of postoperative delirium. The authors investigated whether parecoxib-supplemented IV morphine analgesia could decrease the incidence of delirium in elderly patients after total hip or knee replacement surgery.
METHODS: In a randomized, double-blind, 2-center trial, patients of 60 years or older who underwent elective total hip or knee replacement surgery were assigned in a 1:1 ratio to receive either parecoxib (40 mg at the end of surgery and then every 12 hours for 3 days) or placebo (normal saline). All patients received combined spinal-epidural anesthesia during surgery and IV morphine for postoperative analgesia. The primary outcome was the incidence of delirium within 5 days after surgery.
RESULTS: Between January 2011 and May 2013, 620 patients were enrolled and were included in the intention-to-treat and safety analyses. The incidence of delirium was significantly reduced from 11.0% (34/310) with placebo to 6.2% (19/310) with parecoxib (relative risk 0.56, 95% confidence interval 0.33-0.96, P = .031). The severity of pain and the cumulative consumptions of morphine at 24, 48, and 72 hours after surgery were significantly lower with parecoxib than with placebo (all P < .001), although the differences were small. There was no difference in the incidence of postoperative complications between the 2 groups (12.3% [38/310] with placebo versus 11.6% [36/310] with parecoxib; P = .80).
CONCLUSIONS: For low-risk elderly patients undergoing elective total hip or knee replacement surgery, multidose parecoxib supplemented to IV morphine decreased the incidence of postoperative delirium without increasing adverse events.

鞘內注射嗎啡與硬膜外緩釋注射嗎啡用於小兒後路脊柱融合術術後鎮痛的比較

Intrathecal Morphine Versus Extended-Release Epidural Morphine for Postoperative Pain Control in Pediatric Patients Undergoing Posterior Spinal Fusion

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Anesthesia & Analgesia: 2017 124 2030–2037

背景：脊柱側凸後路融合術是小兒最痛苦的擇期手術之一。良好的術後鎮痛可使患兒早期下床活動和進食。在小兒患者這一人群種，鎮痛的選擇一直不太理想。我們假設與鞘內注射(IT)嗎啡相比，通過硬膜外緩釋注射嗎啡(EREM)可以提供更好的術後鎮痛，且副作用較少。

方法：本次研究主要觀察結果是患者術後 0-48 小時的嗎啡消耗總量。次要結果包括患者第一次自控鎮痛（PCA）需求的時間，疼痛評分，和阿片類藥物的副作用。經過機構審查委員會批准後，本次研究共納入 71 名因特發性脊柱側凸行後路脊柱融合術的患者。受試者被隨機分配到兩組，一組鞘內注射嗎啡 7.5 μg/kg (IT 組)，另一組硬膜外注射嗎啡 150 μg/kg (EREM 組)。其中 IT 組和 EREM 組各包含 37 名和 34 名受試者。術後疼痛通過給予嗎啡 PCA，酮咯酸，口服羥考酮和對乙醯氨基酚來治療。每 4 小時評估受試者的嗎啡消耗量、疼痛評分、噁心嘔吐、皮膚瘙癢和呼吸抑制的情況。在術後第一天，由患兒家長完成患兒照顧者疼痛控制方案的問卷調查。

結果：兩組患者受試者術後 48 小時內嗎啡消耗總量沒有差異，其中 EREM 組：中位數 42.2mg，區間 5.5–123mg；IT 組中位數 34mg，區間 4.5–128.8mg，P =0.27。兩組患者 PCA 第一次鎮痛需求的時間和術後 8～24 小時疼痛評分也無明顯差異。與 IT 組相比，EREM 組的患者術後 28 至 36 小時的疼痛評分較低，且患兒皮膚瘙癢的發生率也較低。

結論：鞘內注射嗎啡與硬膜外緩釋注射嗎啡對於患兒嗎啡消耗總量及 PCA 第一次鎮痛需求的時間無顯著差異。而硬膜外緩釋注射嗎啡對脊柱側凸行後路脊柱融合術的

患者所提供的鎮痛持續時間較長，進而可能減少由於阿片類藥物所導致的皮膚瘙癢。

（陸曉斐譯 李士通校）

BACKGROUND: Posterior spinal fusion for scoliosis is one of the most painful elective pediatric surgeries. Good postoperative pain control allows early ambulation and return of ability to tolerate oral intake. Options for analgesia in this patient population are suboptimal. We hypothesized that extended-release epidural morphine (EREM) would provide better pain control and less adverse effects compared to intrathecal (IT) morphine.
METHODS: The primary outcome was total IV morphine consumption during 0–48 hours postoperatively. Secondary outcomes included time until first patient-controlled analgesia (PCA) demand, pain scores, and adverse opioid effects. After institutional review board approval, 71 subjects undergoing posterior spinal fusion for idiopathic scoliosis completed the study. The subjects were randomly allocated to 7.5 μg/kg IT morphine or 150 μg/kg EREM. The final IT morphine and EREM groups contained 37 and 34 subjects, respectively. Postoperative pain was treated with morphine PCA, ketorolac, oral oxycodone, and acetaminophen. Morphine consumption, pain scores, nausea and vomiting, pruritus, and respiratory depression were measured every 4 hours. Parents completed a caregiver questionnaire about their child's pain control regimen after the first postoperative day.
RESULTS: There was no difference in total morphine consumption over the first 48 hours between subjects in the EREM and IT morphine groups: median (range) 42.2 (5.5–123.0) and 34.0 (4.5–128.8) mg, respectively (P = .27). EREM and IT morphine groups had no difference in time until first PCA demand. Pain scores were no different between the groups from 8 to 24 hours after surgery. Compared to IT morphine, EREM subjects had lower pain scores from 28 to 36 hours after surgery. The reported incidence of pruritus was lower in the EREM subjects.
CONCLUSIONS: There was no difference in total morphine consumption or time until first PCA demand between the EREM and IT morphine groups. EREM provides a longer duration of analgesia after posterior spinal fusion for scoliosis and may be associated with less opioid-induced pruritus.

NR2B-CREB-miR212/132-CRTC1-CREB 信號網路在體外和體內疼痛調節中的作用

The Role of NR2B-CREB-miR212/132-CRTC1-CREB Signal Network in Pain Regulation In Vitro and In Vivo

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背景：疼痛是一種會使人類健康衰弱的威脅，而且它的分子機制尚未確定。之前的研究表明 cAMP 效應元件結合蛋白（CREB）在疼痛調節中具有關鍵作用；CREB 調節轉錄共啟動因數 1（CRTC1）和 microRNA212 / 132（miR212 / 132）在突觸可塑性中也至關重要。然而這些因素在疼痛狀態下的相互作用我們卻瞭解的很少。我們進行這項實驗主要是為了確定CREB，CRTC1 和 miR212 / 132 在體外的相互關係。我們探討了當給予 CREB 相關腺病毒載體，CRTC1 相關腺病毒載體和 miR212 / 132-鎖定核酸（LNA）時，體內慢性縮窄性損傷（CCI）小鼠痛覺過敏的變化。

方法：我們在小鼠胚胎的脊髓中培養原代神經元。將外源性谷氨酸加入到培養的神經元中以模擬體內疼痛過程。 即時定量聚合酶鏈反應用於測定 mRNA 水準下 NR2B，CRTC1，CREB 和 miR212 / 132 的變化。 蛋白質印跡用於檢測 p-NR2B，p-CREB 和 CRTC1 的蛋白質水準。Von Frey 纖毛被用於研究小鼠 CCI 模型中的機械性痛覺過敏。 CREB-miR（腺病毒載體干擾 CREB 基因），CREB-AD（過表達 CREB 基因的腺病毒載體）; 鞘內注射 CRTC1-miR（腺病毒載體干擾 CRTC1 基因），CRTC1-AD（過表達 CRTC1 基因的腺病毒載體）和 miR212 / 132-LNA。

結果：體外，100μmol/ L 谷氨酸誘導 p-CREB 和 miR212 / 132-LNA。 CRTC1 蛋白由 CREB-miR 和 miR212 / 132-LNA 下調。 CRTC1 mRNA 由 CREB-AD 上調，CREB-miR 和 miR212-LNA 下調。 P-CREB 被 CRTC1-AD 上調並被 miR212 / 132 下調。 CREB mRNA 由 CRTC1-AD 上調並被 CRTC1-miR 下調。 MiR212 / 132 被

CRTC1-AD 和 CREB-AD 上調; 由 CREB-miR 下調。 體內，CRTC1-miR，CREB-miR 和 miR212 / 132-LNA 在不同程度上提高爪退縮機械閾值。

結論：NR2B-CREB-miR212 / 132-CRTC1-CREB 信號網路在調節疼痛中起重要作用。與該信號網路中的任何分子進行干預可以減輕疼痛感覺。

（張秋麗譯 李士通校）

BACKGROUND: Chronic pain is a debilitating threat to human health, and its molecular mechanism remains undefined. Previous studies have illustrated a key role of cAMP response element-binding protein (CREB) in pain regulation; CREB-regulated transcription coactivator 1 (CRTC1) and microRNA212/132 (miR212/132) are also vital in synaptic plasticity. However, little is known about the interaction among these factors in pain condition. We conducted this experiment mainly to determine the crosstalk between CREB, CRTC1, and miR212/132 in vitro. Moreover, we explored the changes in hyperalgesia on chronic constrictive injury (CCI) mouse in vivo when given CREB-related adenovirus vectors, CRTC1-related adenovirus vectors, and miR212/132-locked nucleic acid (LNA).
METHODS: We cultured primary neurons in the spinal cord of mouse embryos. Exogenous glutamate was added to cultured neurons to simulate in vivo pain process. Real-time quantitative polymerase chain reaction was used to determine changes of NR2B, CRTC1, CREB, and miR212/132 at the mRNA level; Western blot was used to detect p-NR2B, p-CREB, and CRTC1 at protein level. Von Frey cilia were used to study mechanical hyperalgesia in a murine model of CCI. CREB-miR (adenovirus vector interfering CREB gene), CREB-AD (adenovirus vector overexpressing CREB gene); CRTC1-miR (adenovirus vector interfering CRTC1 gene), CRTC1-AD (adenovirus vector overexpressing CRTC1 gene), and miR212/132-LNA were injected intrathecally.
RESULTS: In vitro, 100 μmol/L glutamate induced p-CREB and miR212/132-LNA. CRTC1 protein was downregulated by CREB-miR and miR212/132-LNA. CRTC1 mRNA was upregulated by CREB-AD and downregulated by CREB-miR and miR212-LNA. P-CREB was upregulated by CRTC1-AD and downregulated by miR212/132. CREB mRNA was upregulated by CRTC1-AD and downregulated by CRTC1-miR. MiR212/132 was upregulated by CRTC1-AD and CREB-AD; downregulated by CREB-miR. In vivo, CRTC1-miR, CREB-miR, and miR212/132-LNA increased paw withdrawal mechanical threshold in various degrees.
CONCLUSIONS: The NR2B-CREB-miR212/132-CRTC1-CREB signal network plays an important role in the regulation of pain. Intervening with any molecule in this signal network would reduce pain perception.