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紅細胞儲存時間：心臟術後譫妄發生的風險因素

Length of red cell unit storage and risk for delirium after cardiac surgery.

Brown CH 4th1, Grega M, Selnes OA, McKhann GM, Shah AS, LaFlam A, Savage WJ, Frank SM, Hogue CW, Gottesman RF.

Anesthesia &Analgesia 2014 119 242–250

背景：輸血前紅細胞儲存的時間可能與一些術後併發症相關，雖然關於這點，現有證據是相互矛盾的。然而，紅細胞儲存的時間和術後譫妄之間的關係尚未被研究。我們認爲，輸注紅細胞的儲存時間與心臟外科術後譫妄的發生有關。

方法：我們進行了一項病例對照研究，納入了 2005 年至 2011 年在 Johns Hopkins 在體外迴圈下行冠狀動脈旁路手術、瓣膜手術以及升主動脈手術中符合准入標準的患者。如果患者未輸注紅細胞，或在住院期間輸注＞4 個單位紅細胞，在術後第一天輸注任何血製品以及同時輸注了保存≤14 天以及＞14 天的紅細胞則被排除在研究之外。符合輸血相關入組標準的患者發生了術後譫妄。對照組患者來源於符合標準的同一人群中未發生譫妄的患者，在年齡（±5 歲），手術日期在 2-2.5 年之內以及手術方式的基礎上按照 1:1 進行配對。計算了每個患者輸注的紅細胞的平均儲存時間。主要研究結果是輸注儲存＞14 天的紅細胞和輸注儲存≤14 天的紅細胞的患者發生術後譫妄比率的差別。次要研究結果是隨著紅細胞平均儲存時間的增加對術後譫妄發生率的影響。我們利用多因素回歸分析來檢驗我們的假說。

結果：在對 87 對病例-對照組的多因素回歸分子中，輸注儲存＞14 天紅細胞的患者與輸注儲存≤14 天紅細胞的患者發生術後譫妄的比率無顯著差別（比值比[OR]1.83;95%的可信區間,0.73-4.58，P=0.20）。紅細胞儲存時間＞14 天，平均儲存時間每增加 1 天，術後譫妄的發生率可增加 1.01 到 1.13 倍（OR, 1.07; P = 0.03）。紅細胞儲存時間＞21 天，平均儲存時間每增加 1 天，術後譫妄的發生率可增加 1.02 到 1.23 倍（OR, 1.12; P = 0.02）。

結論：輸注儲存時間＞14 天的紅細胞與術後譫妄發生率的增加無關。然而，紅細胞儲存＞14 或 21 天，平均儲存時間每增加 1 天，心臟手術後譫妄發生率的增加。仍需要更多的研究進一步研究術後譫妄與輸注紅細胞儲存時間之間的關係。

(杜芳譯 薛張綱校)

BACKGROUND: The time that red cell units are stored before transfusion may be associated with postoperative complications, although the evidence is conflicting. However, the association between the length of red cell unit storage and postoperative delirium has not been explored. We hypothesized that the length of storage of transfused red cell units would be associated with delirium after cardiac surgery.

METHODS: We conducted a case-control study in which patients undergoing coronary artery bypass, valve, or ascending aorta surgery with cardiopulmonary bypass at Johns Hopkins from 2005 to 2011 were eligible for inclusion. Patients were excluded if they did not receive red cell units, received >4 red cell units during hospitalization, received any transfusion after the first postoperative day, or received red cell units that were not exclusively stored for ≤14 days or >14 days. Eighty-seven patients met transfusion-related inclusion criteria and developed postoperative delirium. Controls who did not develop delirium were selected from the same source population of eligible patients and were matched 1:1 based on age (± 5 years), 2- to 2.5-year band of date of surgery, and surgical procedure. For each patient, we calculated the average storage duration of all transfused red cell units. The primary outcome was odds of delirium in patients who were transfused red cell units with exclusive storage duration >14 days compared with that of ≤14 days. Secondary outcomes were odds of delirium with each increasing day of average red cell unit

storage duration. We used conditional multivariable regression to test our hypotheses.

RESULTS: In conditional multivariable analysis of 87 case-control pairs, there was no difference in the odds of patients developing delirium if they were transfused red cell units with an exclusive storage age >14 days compared with that ≤14 days (odds ratio [OR] 1.83; 95% confidence interval, 0.73-4.58, P = 0.20). Each additional day of average red cell unit storage beyond 14 days was associated with a 1.01- to 1.13-fold increase in the odds of postoperative delirium (OR, 1.07; P = 0.03). Each additional day of average storage beyond 21 days was associated with a 1.02- to 1.23-fold increase in the odds of postoperative delirium (OR, 1.12; P = 0.02).

CONCLUSIONS: Transfusion of red cell units that have been stored for >14 days is not associated with increased odds of delirium. However, each additional day of storage >14 or 21 days may be associated with increased odds of postoperative delirium in patients undergoing cardiac surgery. More research is needed to further characterize the association between delirium and storage duration of transfused red cell units

辦公室爲基礎的麻醉——安全性與成效

Office-Based Anesthesia: Safety and Outcomes

Shapiro, Fred E. DO[*]; Punwani, Nathan MD[†]; Rosenberg, Noah M. MD[‡]; Valedon, Arnaldo MD[§]; Twersky, Rebecca MD, MPH[‖]; Urman, Richard D. MD, MBA[¶]

Anesthesia &Analgesia 2014 119 276–285

摘要 辦公室爲基礎的醫療和外科手術的數量不斷增加，推進了門診麻醉的次專科——辦公室爲基礎的麻醉（OBA）的出現。目前多種趨勢促進著 OBA 的成長，包括醫療、外科手術和麻醉藥品的創新，以及供應商報銷制度的改進，爲患者帶來了更大的便利。目前尚缺乏隨機對照試驗來評估辦公室爲基礎的手術和麻醉是否影響患者的發病率和死亡率，因此本研究屬回顧性研究。既往已有文獻開始提及辦公室爲基礎的手術和麻醉的安全性問題。然而，最近的資料表明，門診護理系統可以與醫院和門診手術中心相媲美，尤其是當辦公室已被認可、操作者已被委員會認證。辦公室爲基礎的法律訴訟檔可以從以下方面繼續提高醫護的品質，要使患者參與合適的手術和尊重患者的選擇，供應商資格認證，設備認證，並納入患者安全檢查表和專業協會的實踐指南。越來越多的地方或聯邦政府對該系統行使監管權力，以上策略在辦公室系統中對病人的發病率和死亡率愈發重要。本文旨在探討影響病人安全問題的多種趨勢，能最大限度地減少 OBA 患者併發症和死亡率的策略，以及可能會影響該領域的未來發展因素。

（江凌慧譯 薛張綱校）

The increasing volume of office-based medical and surgical procedures has fostered the emergence of office-based anesthesia (OBA), a subspecialty within ambulatory anesthesia. The growth of OBA has been facilitated by numerous trends, including innovations in medical and surgical procedures and anesthetic drugs, as well as improved provider reimbursement and greater convenience for patients. There is a lack of randomized controlled trials to determine how office-based procedures and anesthesia affect patient morbidity and mortality. As a result, studies on this topic are retrospective in nature. Some of the early literature broaches concerns about the safety of office-based procedures and anesthesia. However, more recent data have shown that care in ambulatory settings is comparable to hospitals and ambulatory surgery centers, especially when offices are accredited and their proceduralists are board-certified. Office-based suites can continue to enhance the quality of care that they deliver to patients by engaging in proper procedure and patient selection, provider credentialing, facility accreditation, and incorporating patient safety checklists and professional society guidelines into practice. These strategies aiming at patient morbidity and mortality in the office setting will be increasingly important as

more states, and possibly the federal government, exercise regulatory authority over the ambulatory setting. We explore these trends, their implications for patient safety, strategies for minimizing patient complications and mortality in OBA, and future developments that could impact the field.

凝血、絮凝和變性：麻醉學進入細胞質理論研究的世紀

Coagulation, Flocculation, and Denaturation: A Century of Research into Protoplasmic Theories of Anesthesia

Perouansky, Misha MD

Anesthesia &Analgesia 2014 119 311–320

在二十年的麻醉發現中，物化概念“膠質”和生物學概念“細胞質”已經產生。將這些概念融合進入一個理論框架，這個理論框架已被遺忘多年，它預示著基本生物學真理的揭示和“乙醚時代”之後一個世紀的麻醉理論研究。在 19 世紀 70 年代，細胞質凝固將在光學顯微鏡下觀察到的未染色組織的改變濃縮成爲一種麻醉理論。細胞質中蛋白質的構象變化產生所有麻醉效應這一根本的理論一直受人追捧到 20 世紀。目的是用基礎細胞生物框架中的物理化學變化來解釋麻醉。這個巨大的框架在脂質細胞膜理論霸權的幾十年中被遺忘，甚至在可興奮胞膜中蛋白質是麻醉快速起效的介質這一堅實的理論建立起來之後，此框架仍舊黯淡無光。現在人們的注意力越來越多的指向更好的研究（無）意識的本質，因爲在常規的病理學概念中麻醉藥的非經典結果不能解釋。本文就希望在這樣一個時刻重新回顧基於“細胞質理論”的持續已久的跨學科的研究。

(蓋曉冬譯 薛張綱校)

Within two decades of the discovery of anesthesia, the physicochemical concept of colloid and the biological concept of protoplasm had emerged. Fusion of these concepts into a theoretical framework, which has been largely forgotten decades ago, promised to uncover fundamental biological truths and determined research into anesthetic mechanisms for a century after "Ether Day." Observations of optical changes in unstained tissue were condensed into a theory of anesthesia by coagulation of protoplasm in the 1870s. The underlying hypotheses, conformational changes of proteins within the protoplasm cause all behavioral effects of anesthesia, continued to be pursued well into the 20th century. The goal was to explainanesthesia using physical chemistry within a fundamental cell biological framework. This large body of work, swept aside during the decades of lipid membrane hegemony, has remained in obscurity even after proteins in excitable membranes became firmly established as mediators of the immediate anesthetic effects. This article is a reminder of the prolonged interdisciplinary research effort dedicated to "protoplasmic theories" at a time when attention is increasingly directed toward examining the nature of (un)consciousness well as noncanonical consequences of anesthetic exposure that are not easily accounted for within conventional pharmacological concepts**.**

護士管理的程式化鎮靜與麻醉監管的安全性比較：一項對先進的內窺鏡檢查病人鎮靜的回顧性研究

The safety of nurse-administered procedural sedation compared to anesthesia care in a historical cohort of advanced endoscopy patients.

Guimaraes ES[1], Campbell EJ, Richter JM.

Anesthesia &Analgesia 2014 119 349–356

背景：2010 年 4 月，Medicare 和 Medicaid 服務中心開始對住院行內窺鏡檢查的病人深鎮靜，針對這一轉變，我科對所有行內窺鏡檢查的病人進行麻醉監管。與護士管理的程式化鎮靜相比，麻醉監管是否能降低內鏡下逆行性胰膽管造影和超

聲內鏡病人鎮靜相關併發症或提高鎮靜品質尚屬未知，因此，我們回顧了該政策變化前後 5 年內鎮靜相關併發症的發生情況。

方法：我們回顧了 2007 年 10 月至 2012 年 10 月期間某中心行內鏡下逆行性胰島管造影或超聲內鏡檢查的 9598 例成年病人的病史資料，對該政策變化前後鎮靜、內鏡檢查及總併發症的發生率進行比較，並對主要併發症的發病率和死亡率進行了比較。

結果：該政策變化前後報導的鎮靜相關併發症發生率爲 0.38%（17/4514） VS 0.08%（4/5084），該結果具有統計學差異(P = 0.002, diff = 0.3, 95% 可信區間, 0.11%-0.53%)；內鏡檢查相關併發症差異不大: 0.66% vs 0.87% (P = 0.293, diff = 0.2, 95% 可信區間，-0.16% - 0.56%)。總併發症(1.11% vs 1.00%, P = 0.618) 和主要併發症的發病率和死亡率(0.27% vs 0.33%, P = 0.581) 差異不明顯。

總結：與護士管理的程式化鎮靜相比，對行先進的內窺鏡檢查的高危人群進行麻醉監管可顯著降低鎮靜相關併發症的發生率。內窺鏡相關併發症發生率差別不大。鎮靜風險的降低並不能改善主要併發症的發生率和死亡率，對總併發症發生率的影響也不大。

（郝光偉譯 薛張綱校）

BACKGROUND: In April 2010, in response to a change in Centers for Medicare and Medicaid Services regulation placing deep sedation under hospital anesthesia services, our institution began providing anesthesia care for all advanced endoscopic procedures. Because it remains unknown whether anesthesia care reduces sedation-related complications or improves quality of care versus nurse-administered sedation for endoscopic retrograde cholangiopancreatography and endoscopic ultrasound patients, we retrospectively compared complications in a 5-year historical cohort before and after the policy change.

METHODS: We reviewed a historical cohort of 9598 consecutive endoscopic retrograde cholangiopancreatography and endoscopic ultrasound examinations for adult patients at a single institution during a 5-year period (October 2007-October 2012). We compared procedures performed before and after the policy change for the incidence of sedation, endoscopic, and total complications, and for major morbidity and mortality.

RESULTS: The incidence of reported sedation-related complications was 0.38% (17 of 4514) before the policy change and 0.08% (4 of 5084) after the policy change, which was statistically significant (P = 0.002, diff = 0.3, 95% confidence interval, 0.11%-0.53%). Endoscopic complications were not significantly different before versus after: 0.66% vs 0.87% (P = 0.293, diff = 0.2, 95% confidence interval, -0.16% to 0.56%). Total complications (1.11% vs 1.00%, P = 0.618) and major morbidity and mortality (0.27% vs 0.33%, P = 0.581) did not differ between the 2 time periods.

CONCLUSIONS: Anesthesia care for advanced endoscopy in a high-risk population significantly reduced sedation complications compared with nurse-administered sedation. Endoscopic complications were unchanged. The sedation risk reduction did not reduce major morbidity, mortality, or total complications.

基於肌電圖描記方法的肌肉鬆弛定量監測裝置在一家教學醫院麻醉科的應用

The Implementation of Quantitative Electromyographic Neuromuscular Monitoring in an Academic Anesthesia Department

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背景：雖然專家認爲定量地監測神經肌肉阻滯相當重要，尤其在麻醉蘇醒階段，但是這項監測並沒有得到廣泛應用。本文主要介紹我們科室對於應用這項監測的

歷程及經驗。

方法：在 2010 年中旬，本文的一些主要作者開始關注科室內麻醉醫生關於非去極化肌松藥的應用，研究方法主要是通過觀察和回顧科室內品質保證/不良事件資料庫。通過回顧，我們發現每年在 PACU 大約有 2-4 例的蘇醒後再插管的發生率，而這些都認爲可能與肌松藥的不完全逆轉有關。對於此，2011 年一月份，我們在所有的手術室安裝了定量監測肌肉阻滯裝置（Datex-Omeda ElectroSensor™ EMG system）。伴隨著新設備的引進，我們面臨著將設備普及的任務，但這一過程很緩慢：在 2011 中旬，監測裝置在不到 50%的全麻病人中得到應用，關於非去極化肌松藥的不良事件仍在發生。因此，從 2011 年八月及隨後的兩年，我們在 PACU 進行了五次獨立的抽樣調查，調查記錄了 409 名術中應用非去極化肌松藥的已拔出氣管導管的成年病人及 73 名術中未應用去極化肌松藥的病人的 TOF 值。每次調查的結果都要全科室通報，我們同時還進行個體病例的討論，最新文獻的回顧和使用這一裝置的再教育。

結果：在第一次 PACU 的抽樣調查中（2011 年 8 月），有 96 名病人在術中應用了非去極化肌松藥，31%的病人 TOF≤0.9，17%的病人 TOF≤0.8 和 4%的病人 TOF≤0.5。通過記錄回顧，在這些病人中只有 51%的病人應用了定量肌松監測而 23%的病人在術中未使用任何監測。在第四次抽樣調查中（2012 年 12 月），101 名病人中只有 15%的病人 TOF≤0.9，而 5%的病人 TOF≤0.8(與第一次有顯著的統計學差異)。最後一次抽樣調查（2013 年 7 月）顯示了與前次幾乎相近的資料。而在術中未應用非去極化肌松藥的病人中 TOF 的最低值爲 0.92。在過去的兩年中，本科室的麻醉醫生在術中應用羅庫溴銨及新斯的明的習慣並沒有多大改變，但由於非去極化肌松藥殘餘導致的在 PACU 的再插管卻再未發生。

討論：肌電圖描記方式爲基礎的定量肌松監測的普及需要一次持續的再教育過程及重複的 PACU 抽樣調查及使用者的回饋。然而，這些努力卻顯著減少了在 PACU 的病人肌松不完全逆轉的發生率。

（王飛譯 薛張綱校）

BACKGROUND: Although experts agree on the importance of quantitative neuromuscular blockade monitoring, particularly for managing reversal, such monitoring is not in widespread use. We describe the processes and results of our departmental experience with the introduction of such quantitative monitoring.

METHODS: In mid-2010, the senior authors became concerned about the management of nondepolarizing neuromuscular blockers (NMB) by providers within the department, based on personal observations and on a review of a departmental quality assurance/adverse event database. This review indicated the occurrence of 2 to 4 reintubations/year in the postanesthesia care unit (PACU) that were deemed to be probably or possibly related to inadequate reversal. In response, quantitative blockade equipment (Datex-Omeda ElectroSensor™ EMG system) was installed in all our main operating rooms in January 2011. This introduction was accompanied by an extensive educational effort. Adoption of the system was slow; by mid-2011, the quantitative system was being used in <50% of cases involving nondepolarizing relaxants and adverse NMB-related events continued to occur. Therefore, starting in August 2011 and extending over the next 2 years, we performed a series of 5 separate sampling surveys in the PACU in which train-of-four (TOF) ratios were recorded in 409 tracheally extubated adult patients who had received nondepolarizing NMB (almost exclusively rocuronium) as well as in 73 patients who had not received any nondepolarizing NMB. After each survey, the results were presented to the entire department, along with discussions of individual cases, reviews of the recent literature regarding quantitative monitoring and further education regarding the use of the quantitative system.

RESULTS: In the initial (August 2011) PACU survey of 96 patients receiving nondepolarizing NMBs, 31% had a TOF ratio of ≤0.9, 17% had a ratio of ≤0.8, and 4 patients (4%) had ratios of ≤0.5. A record review showed that the quantitative monitoring system had been used to monitor reversal in only 51% of these patients, and 23% of patients had no evidence of any monitoring, including qualitative TOF

assessment. By December of 2012 (after 2 interim PACU monitoring surveys), a fourth survey showed 15% of 101 monitored patients had a TOF ratio ≤0.9, and only 5% had ratios ≤0.8. ($P < 0.05$ vs August 2011). Clear documentation of reversal using the quantitative system was present in 83% of cases ($P < 0.05$ vs August 2011). A final survey in July 2013 showed nearly identical values to those from December 2012. The lowest TOF ratio observed in any patient not receiving a nondepolarizing NMB was 0.92. There were no changes in the patterns of either rocuronium or neostigmine use over the duration of the project (through December 2012), and there have been no cases of NMB-related reintubations in the PACU during the last 2 years.

DISCUSSION: Implementation of universal electromyographic-based quantitative neuromuscular blockade monitoring required a sustained process of education along with repeated PACU surveys and feedback to providers. Nevertheless, this effort resulted in a significant reduction in the incidence of incompletely reversed patients in the PACU.

麻醉期間綜合變異指數用於衡量疼痛與鎮痛之間平衡作用的精確性

Accuracy of the Composite Variability Index as a Measure of the Balance Between Nociception and Antinociception During Anesthesia

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背景：綜合變異指數（CVI）來源於對腦電圖的監測，用於評估疼痛與鎮痛之間的平衡，而腦電雙頻指數（BIS）用於評估麻醉過程中的催眠狀態。我們通過測定刺激前後的催眠深度（BIS 值）和鎮痛作用（依據瑞芬太尼的效應室濃度，CeREMI）來研究這兩個指標之間的關係。同時，我們監測在應對傷害性刺激時和體動之間的聯繫。

方法：我們將 120 位病人隨機分爲 12 組，分別設置每組不同的催眠深度（BIS 值爲 70，50,30）和 CeREMI（0, 2, 4, or 6 ng/mL）。在僞穩定狀態觀察基線值，並提供一系列刺激。根據 BIS 值、CVI 和心率（HR）以及平均動脈壓（MAP）的變化可分析催眠深度、鎮痛作用以及對刺激的體動反應。

結果：與 HR, MAP, CeREMI 以及丙泊酚的效應室濃度相比，CVI 和 BIS 值與警覺-鎮靜-有害刺激評分具有更加精確的關聯性（事後比較檢驗 $P< 0.01$）。對於監測對刺激的反應，CVI 的變化比 BIS, HR 和 MAP 更具有說服力（馬修斯相關係數示具有顯著性差異 $P < 0.001$）。相比之下，沒有一個病人的鎮痛狀態和阿片類藥物濃度以及 BIS 值監測的催眠狀態有特定的相關性。

結論：CVI 和應對傷害性刺激的體動反應具有相關性。而未接受刺激時的 CVI 更多的取決於鎮靜藥的作用而非阿片類藥物濃度。

（潘豔譯 薛張綱校）

BACKGROUND: The Composite Variability Index (CVI), derived from the electroencephalogram, was developed to assess the antinociception–nociception balance, whereas the Bispectral Index (BIS) was developed to assess the hypnotic state during anesthesia. We studied the relationships between these indices, level of hypnosis (BIS level), and antinociception (predicted remifentanil effect-site concentrations, CeREMI) before and after stimulation. Also, we measured their association with movement in response to a noxious stimulus.

METHODS: We randomized 120 patients to one of 12 groups targeting different hypnotic levels (BIS 70, 50, and 30) and various CeREMI (0, 2, 4, or 6 ng/mL). At pseudo-steady state, baseline values were observed, and a series of stimuli were

applied. Changes in BIS, CVI, heart rate (HR), and mean arterial blood pressure (MAP) between baseline and response period were analyzed in relation to level of hypnosis, antinociception, and somatic response to the stimuli.

RESULTS: CVI and BIS more accurately correlate with somatic response to an Observer Assessment of Alertness and Sedation-noxious stimulation than HR, MAP, CeREMI, and propofol effect-site concentration (Tukey post hoc tests $P < 0.01$). Change in CVI is more adequate to monitor response to stimulation than changes in BIS, HR, or MAP (as described by the Mathews Correlation Coefficient with significance level set at $P < 0.001$). In contrast, none of the candidate analgesic state indices was uniquely related to a specific opioid concentration and is extensively influenced by the hypnotic state as measured by BIS.

CONCLUSIONS: CVI appears to correlate with somatic responses to noxious stimuli. However, unstimulated CVI depends more on hypnotic drug effect than on opioid concentration.

擇期腦外科術前風險評分的使用證據:系統回顧文獻

Evidence for the use of preoperative risk assessment scores in elective cranial neurosurgery: a systematic review of the literature.

Reponen E[1], Tuominen H, Korja M.

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背景:術前風險評分通過提供預測的結果來指導病人管理。多種風險評分被用於腦外科術前評估,但對它們的臨床相關性研究還是很匱乏的。因此,目前尚不清楚這些風險評分對於腦外科預後是否是有益的或有用的。在這篇綜述中,我們總結了目前擇期腦外科使用術前風險評分的科學證據。

方法:系統回顧 MEDLINE、Embase,和 PubMed 資料庫 2013 年 11 月的 25 個相關研究,每個研究至少 30 例。研究評估術前 ASA 分級, 卡氏行爲狀態評分(KPS), 查爾森指數,標準化後的蘭金規模和性別、位置和水腫評分(SKALE)評估腦外科術的預後情況。文獻原始資料中的手術和非手術治療的併發症被分別評估。爲此,根據報告結果研究被分爲四類:手術治療結果,非手術治療結果,發病率和死亡率。作爲首選報告,系統回顧和 Meta 分析指導系統評價。

結果:研究表明 KPS 用以預測手術相關併發症最可靠。研究發現沒有任何一種術前評估能夠用以預測術後非外科相關併發症。KPS 和 ASA 分級可早期預測(≤30 天)顱內腫瘤患者的發病率。查爾森指數可適用於預測擇期手術的顱內動脈瘤患者的死亡率。在設計中只有 4 個研究具有前瞻性。

結論:我們需要大型前瞻性研究來證實術前風險評分對於腦外科手術的意義。不過看來,病人術前的生理和功能狀態可以用來預測擇期腦外科術後急性和慢性併發症。

（黃文惠譯 薛張綱校）

BACKGROUND:Preoperative risk scores are designed to guide patient management by providing a means of predicting operative outcome. Several risk scores are used in neurosurgery, but studies on their clinical relevance are scarce. Therefore, it is not clear whether these risk scores are beneficial or helpful in predicting outcome after elective cranial neurosurgery. In this review, we summarize the current scientific evidence for using preoperative risk scores in elective cranial neurosurgery.

METHODS:A systematic review of the MEDLINE, Embase, and PubMed databases in November 2013 yielded 25 relevant studies with a minimum of 30 patients per study. The studies evaluated the value of the preoperative ASA physical status classification, the Karnofsky performance score (KPS), the Charlson comorbidity score, the modified Rankin Scale and the sex, KPS, ASA physical status classification,

location, and edema (SKALE) score in assessing postoperative outcome in cranial neurosurgery. Surgery-related and nonsurgical complications were assessed separately whenever reported in the original article. For this purpose, the studies were placed into 4 categories based on the reported outcome: surgery-related outcome, nonsurgical outcome, morbidity, and mortality. The Preferred Reporting Items for Systematic reviews and Meta-analyses guidelines for systematic reviews were followed.

RESULTS:KPS has the strongest support in the literature for predicting surgery-related outcomes. There is no strong support in the literature for the use of any preoperative scores in predicting nonsurgical outcomes after elective craniotomies. KPS and ASA physical status classification seem to predict early (≤ 30-day) morbidity of intracranial tumor patients. The Charlson comorbidity score may be applicable in predicting mortality of elective intracranial aneurysm patients. Only 4 studies were prospective in design.

CONCLUSIONS:Large prospective studies are needed to validate the use of the reviewed risk scores in elective cranial neurosurgery. It appears, however, that the patient's preoperative physical and functional status can be used to predict the short- and long-term outcome in elective cranial neurosurgery.

利用多靶點探針對頑固性骶髂關節痛射頻消融：一項 60 例患者的臨床研究

Sacroiliac joint radiofrequency ablation with a multilesion probe: a case series of 60 patients.

Schmidt PC, Pino CA, Vorenkamp KE.

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摘要：此項研究是回顧性分析研究，利用多靶點探針技術對頑固性骶髂關節痛的患者行 77 次射頻消融治療。其中 16 次（20.8%）治療，患者疼痛無緩解；55 次（71.4%）治療後，可緩解超過 50%的疼痛，維持 6 周；42 次治療後（54.5%，95%可信區間，42.8%-65.8%）患者可緩解超過 50%的疼痛，維持 6 月；12 次（15.6%）治療，可緩解超過 50%的疼痛，維持一年。研究結果經與既往其他射頻消融技術研究相比，結果可靠，存在優勢。綜上所述，超過半數的頑固性骶髂關節痛患者經過此項射頻消融技術治療後，疼痛緩解可超過半年。

（王嘉興譯 薛張綱校）

This retrospective case series of patients with refractory sacroiliac joint (SIJ) pain presents our first 77 SIJ radiofrequency ablation (RFA) procedures performed with a multilesion probe. Of these, 16 (20.8%) provided no relief; 55 (71.4%) provided >50% pain relief at 6 weeks; 42 (54.5%, 95% confidence interval, 42.8%-65.8%) provided >50% pain relief at 6 months; and 12 (15.6%) continued to provide >50% pain relief at 1 year. These results compare favorably to those published using other RFA techniques. In conclusion, more than half of our patients with refractory SIJ pain received some pain relief for at least 6 months after RFA.

炎性疼痛可能與 IL-6 介導的及突觸後密度-95 相關的認知功能受損有關

Inflammatory pain may induce cognitive impairment through an interlukin-6-dependent and postsynaptic density-95-associated mechanism.

Yang L[1], Xin X, Zhang J, Zhang L, Dong Y, Zhang Y, Mao J, Xie Z.

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背景： 疼痛可能與人類認知功能障礙相關聯。然而，在臨床前模型中這種影響的特徵與潛在機制的研究在很大程度上需要進行探索。因此，我們試圖建立一個系統，以確定疼痛對認知功能的影響。

方法：將完全弗氏佐劑（CFA）注射在 5 至 8 個月大的野生型和 IL-6 基因敲除小鼠的後肢。對小鼠的學習和記憶功能，皮層和海馬的白介素-6 和突觸後密度（PSD）-95 水準進行評估。

結果：我們發現，在注射後 3 天和 7 天，小鼠對 CFA 注射引起的疼痛在音調檢測中降低了冷凍時間（30.1[16.5]對 56.8[28.1]秒，P = 0.023），這評估了與海馬無關的學習和記憶功能，但不是恐懼調節系統的環境測試（15.8[6.7]與 18.6[8.8]秒，P=0.622），後者評估了在注射 3 天后與海馬相關的學習記憶功能。小鼠在注射 CFA 後，皮層水準的白細胞介素-6 水準增加(248% [11.6] vs 100% [7.9], P < 0.0001)，PSD-95 水準下降(40% [10.0] vs 100% [20.3], P < 0.0001)，但海馬沒有(95% [8.6] vs 100% [9.3], P =0.634)。白細胞介素 6 基因敲除小鼠在 CFA 注射後既不降低皮質 PSD-95 的水準，也沒有認知損害。

結論：這些結果表明，CFA 注射引起的疼痛可能在皮層增加 IL-6 的水準，減少 PSD-95 的水準，但沒有在小鼠的海馬，導致小鼠的與海馬無關的認知損傷。這些發現需要進一步調查，以確定疼痛在認知功能中的作用。

（吳赤譯 薛張綱校）

BACKGROUND: Pain might be associated with cognitive impairment in humans. However, the characterization of such effects in a preclinical model and the investigation of the underlying mechanisms remain largely to be determined. We therefore sought to establish a system to determine the effect of pain on cognitive function in mice.

METHODS: Complete Freund's adjuvant (CFA) was injected in the hindpaw of 5- to 8-month-old wild-type and interleukin-6 knockout mice. Learning and memory function, and the levels of interleukin-6 and postsynaptic density (PSD)-95 in the cortex and hippocampus of mice were assessed.

RESULTS: We found that the CFA injection-induced pain in the mice at 3 and 7 days after injection and decreased the freezing time (30.1 [16.5] vs 56.8 [28.1] seconds, P =0.023) in the tone test, which assesses the hippocampus-independent learning and memory function, but not in a context test of Fear Conditioning System (15.8 [6.7] vs 18.6 [8.8] seconds, P =0.622), which assesses the hippocampus-dependent learning and memory function, at 3 days after injection. Consistently, the CFA injection increased interleukin-6 (248% [11.6] vs 100% [7.9], P < 0.0001) and decreased the PSD-95 (40% [10.0] vs 100% [20.3], P < 0.0001) level in the cortex, but not hippocampus (95% [8.6] vs 100% [9.3], P =0.634), in the mice. The CFA injection induced neither reduction in the cortex PSD-95 levels nor cognitive impairment in the interleukin-6 knockout mice.

CONCLUSIONS: These results suggest that pain induced by CFA injection might increase interleukin-6 levels and decrease PSD-95 levels in the cortex, but not hippocampus of mice, leading to hippocampus-independent cognitive impairment in mice. These findings call for further investigation to determine the role of pain in cognitive function.

心血管麻醉醫師協會的 35 年概述

An Essay on 35 Years of the Society of Cardiovascular Anesthesiologists

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本文于心血管麻醉醫師協會成立 35 周年之際，記述其自 1979 年成立至今所取得

的成就。其中包括爲麻醉科等醫生提供了關於心臟、胸部及血管手術病人圍術期監護的培訓方案，擁有經食管超聲心動檢查技術的認證資格及心胸麻醉的培訓資格。此外，該協會還參與《麻醉與鎮痛》雜誌的發行,並通過建立研究論壇和爲同行評議項目提供資金以支援相關研究。心血管麻醉醫師協會的第一個 35 年取得了非凡卓越的成就。

（隋永恆 譯 陳傑 校）

This is an historical account of the accomplishments of the Society of Cardiovascular Anesthesiologists from its founding in 1989 to the present. It is written on the occasion of the 35th anniversary of the founding of this organization. The society accomplishments include providing a means to educate anesthesiologists and others about the perioperative care of patients undergoing cardiac, thoracic, and vascular surgery. The society has led accreditation of transesophageal echocardiography and education in cardiothoracic anesthesia. The society publishes a section within Anesthesia & Analgesia and supports investigation by providing a forum for the discussion of research and funding peer-reviewed projects. The first 35 years of the Society of Cardiovascular Anesthesiologists has been remarkable in all that has been accomplished.

病態肥胖病人在減肥手術後額外給氧不能減少手術部位感染及癒合相關併發症的發生：一項隨機盲法研究

Supplemental Postoperative Oxygen Does Not Reduce Surgical Site Infection and Major Healing-Related Complications from Bariatric Surgery in Morbidly Obese Patients: A Randomized, Blinded Trial

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背景：病態肥胖病人有包括手術部位感染在內的圍術期併發症風險。病態肥胖病人較低的基礎動脈氧合導致了組織低氧合，這是決定感染風險的基本因素。因此本研究對術後額外給氧 12 到 16 h 可以減少手術部位感染和治療相關併發症的假說進行了驗證。

方法：接受開放式或腔鏡減肥手術的病態肥胖病人在術中給予 80%氧氣吸入。在術後，這些病人被隨機分配到兩組，在氣管導管拔除後第一組病人通過鼻插管給予 2L/min 氧氣，第二組給予大約 80%氧氣吸入，兩組治療都持續至術後第一日早晨。術後 60 天評估手術部位感染和主要治療相關併發症。

結果：在一個初始包含 400 名病人的預先計畫的中期分析中，觀察到的總體併發症發生率爲 13.3%，每個主要併發症的發生率在 0%（腹膜炎）到 8.5%（手術部位感染）之間。在糾正偏倚後，術後第一個 60 天內發生的任何至少發生 1 例的主要併發症的預估 RR 值爲 0.94（95%可信區間爲 0.52-1.68) (P = 0.80, Cochran–Mantel–Haenszel)。研究小組據此認爲研究無效而終止了實驗。

結論：術後額外給氧不能減少接受胃分流手術病人術後手術部位感染和治療相關併發症的發生。

（張帆 譯 陳傑 校）

BACKGROUND: Morbidly obese patients are at high risk for perioperative complications, including surgical site infections. Baseline arterial oxygenation is low in the morbidly obese, leading to low tissue oxygenation, which in turn is a primary determinant of infection risk. We therefore tested the hypothesis that extending intraoperative supplemental oxygen 12 to 16 hours into the postoperative period reduces the risk of surgical site infection and healing-related complications.

METHODS: Morbidly obese patients having open or laparoscopic bariatric surgery were given 80% inspired oxygen intraoperatively. Postoperatively, patients were

randomly assigned to either 2 L/min of oxygen via nasal cannula or approximately 80% supplemental inspired oxygen after tracheal extubation until the first postoperative morning. The risks of surgical site infection and of major healing-related complications were evaluated 60 days after surgery.

RESULTS: In a preplanned interim analysis based on the initial 400 patients, the overall observed incidence of the collapsed composite of major complications was 13.3%; the observed incidence of components of the composite outcome ranged from 0% (peritonitis) to 8.5% (surgical wound infection). The estimated relative risk of any ≥1 major complications occurring within the first 60 days after surgery, adjusting for study site, was 0.94 (95% confidence interval, 0.52–1.68) (P = 0.80, Cochran–Mantel–Haenszel). The Executive Committee thus stopped the trial for futility.

CONCLUSIONS: Supplemental postoperative oxygen does not reduce the risk of surgical site infection rate and healing-related postoperative complications in patients having gastric bypass surgery.

硬膜外鎮痛與降低產後抑鬱症風險的相關性:一項前瞻性佇列研究

Epidural Labor Analgesia Is Associated with a Decreased Risk of Postpartum Depression: A Prospective Cohort Study

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背景：產後抑鬱症是一種產後常見的精神疾病。病因尚不清楚,可能涉及多個因素。本試驗研究硬膜外鎮痛是否與產後抑鬱症的風險降低有關。

方法：214 名準備行經陰道分娩的產婦被納入這項前瞻性佇列研究。214 名產婦中有 107 名要求行硬膜外鎮痛。分娩後 3 天和 6 周用愛丁堡產後抑鬱量表評估產婦的精神狀態。產後抑鬱症定義爲第 6 周評分 10 分或以上。收集產婦的個人資料與圍產期參數。使用多元 logistic 回歸分析評估硬膜外鎮痛和產後抑鬱症之間的相關性。

結果：接受硬膜外鎮痛的產婦產後抑鬱症發生率爲 14.0% (15/107)，未接受硬膜外鎮痛的產後抑鬱症發生率爲 34.6%(37/107)（ P < 0.001）。使用硬膜外鎮痛與產後抑鬱症的發生率降低有關（比值比 OR=0.31，95%可信區間 CI 0.12 --0.82，P = 0.018)。懷孕期間參加分娩教育班(OR=0.30，95% CI 0.30 - 0.12，P = 0.015), 和產後持續母乳餵養 (OR=0.02，95% CI 0.02 - 0.00，P < 0.001)也與產後抑鬱症發生率降低有關。產後第三天較高的愛丁堡產後抑鬱量表得分與產後抑鬱症的發生率增加有關(OR=1.20，95% CI 1.20 - 1.05，P = 0.009)。

結論：硬膜外鎮痛與降低產後抑鬱症的發生率有關。仍需要大樣本進一步研究來評估硬膜外鎮痛對產後抑鬱症的發生率的影響。

(林雨軒 譯 陳傑 校)

BACKGROUND: Postpartum depression is a common psychiatric disorder in parturients after delivery. The etiology remains unclear, and multiple factors may be involved. In this study, we investigated whether epidural labor analgesia was associated with a decreased risk of postpartum depression development.

METHODS: Two hundred fourteen parturients who were preparing for a vaginal delivery were enrolled in this prospective cohort study. Epidural labor analgesia was performed in 107 of 214 patients on their request. Parturients' mental status was assessed with the Edinburgh Postnatal Depression Scale at 3 days and 6 weeks after delivery. A score of 10 or higher on the scale at 6 weeks was used as an indication of postpartum depression. Parturients' characteristics together with perinatal variables

were collected. Multivariate logistic regression analysis was performed to assess an association between the use of epidural analgesia and the occurrence of postpartum depression.

RESULTS: Postpartum depression occurred in 14.0% (15 of 107) of parturients who received epidural labor analgesia and in 34.6% (37 of 107) of those who did not (P < 0.001). Use of epidural labor analgesia was associated with a decreased risk of postpartum depression (odds ratio [OR] 0.31, 95% confidence interval [CI], 0.12–0.82, P = 0.018). Attendance at childbirth classes during pregnancy (OR 0.30, 95% CI, 0.12–0.79, P = 0.015) and continued breast-feeding after delivery (OR 0.02, 95% CI, 0.00–0.07, P < 0.001) were also associated with decreased risks of postpartum depression. A high Edinburgh Postnatal Depression Scale score at 3 days postpartum was associated with an increased risk of postpartum depression (OR 1.20, 95% CI, 1.05–1.37, P = 0.009).

CONCLUSIONS: Epidural labor analgesia was associated with a decreased risk of postpartum depression. Further study with a large sample size is needed to evaluate the impact of epidural analgesia on the occurrence of postpartum depression.

兒童腹橫肌平面阻滯：關於 1994 例來自 PRAN(兒童區域麻醉網路)資料庫病例的多中心安全性分析

Transversus Abdominis Plane Block in Children: A Multicenter Safety Analysis of 1994 Cases from the PRAN (Pediatric Regional Anesthesia Network) Database

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背景：目前沒有足夠證據支持腹橫肌平面阻滯用於改善兒童術後疼痛的安全性。在兒童中進行大型隨機試驗的主要障礙就是被反復提到的安全問題。目前研究的主要目的是確定在兒童中由腹橫肌平面阻滯所導致的總體及特定併發症的發生率。此外本研究對相同人群中局麻藥劑量選擇的方案進行評估。

方法：這是一項使用兒童區域麻醉網資料庫進行的觀察性研究。腹橫肌平面阻滯所導致的併發症定義爲存在以下至少一項術中和/或術後因素：腹膜或器官穿刺，血管穿刺，心血管、肺部和/或神經症狀/體征，血腫和感染。額外分析用來確定局麻藥劑量的方案。

結果：研究納入了 1994 例接受腹橫肌平面阻滯的兒童，只有兩例併發症的報導：一例爲局麻藥誤注射入血管，另一例是腹腔注內射，導致總體併發症發生率爲 0.1%(0.02%-0.03%)，特定併發症（血管注射或腹腔穿刺）發生率爲 0.05%（0.0054%-0.2000%）。這兩例併發症都不需要額外的干預措施也沒有導致後遺症。雙側腹橫肌平面阻滯時的局麻藥劑量中位數(95%區間)爲布比卡因 1.0mg/kg（0.47-2.29mg/kg），然而受試者的體重不足以解釋劑量的巨大差異。1944 例中有 135 例（6.9%；95%CI，5.8%-8.1%）所接受的劑量可能是有潛在毒性效應的。接受潛在毒性劑量的受試者年齡小於未接受潛在毒性劑量的受試者，分別爲 64（19-100）個月和 108（45-158）個月。

結論：在兒童中與腹橫肌平面阻滯相關的併發症發病率占所有併發症的 0.3%，更爲重要的是，併發症影響非常小並且不需要任何額外的干預措施。相比之下，局麻藥劑量使用時較大的差異不僅減少了腹橫肌平面阻滯可能鎮痛的優點，而且還可能導致局麻藥毒性作用。只要選擇適當的局麻劑量方案，安全問題不應該成爲在兒童中進行隨機試驗以檢測腹橫肌平面阻滯有效性的一個主要障礙。

（王筱婧 譯 陳傑 校）

BACKGROUND: Currently, there is not enough evidence to support the safety of the transversus abdominis plane (TAP) block when used to ameliorate postoperative pain in children. Safety concerns have been repeatedly mentioned as a major barrier to

performing large randomized trials in children. The main objective of the current investigation was to determine the incidence of overall and specific complications resulting from the performance of the TAP block in children. In addition, we evaluated patterns of local anesthetic dosage selection in the same population.

METHODS: This was an observational study using the Pediatric Regional Anesthesia Network database. A complication from the TAP block was defined by the presence of at least one of the following intraoperative and/or postoperative factors: puncture of the peritoneum or organs, vascular puncture, cardiovascular, pulmonary and/or neurological symptoms/signs, hematoma, and infection. Additional analyses were performed to identify patterns of local anesthetic dosage.

RESULTS: One thousand nine hundred ninety-four children receiving a TAP block were included in the analysis. Only 2 complications were reported: a vascular aspiration of blood before local anesthetic injection and a peritoneal puncture resulting in an overall incidence of complications (95% CI) of 0.1% (0.02%–0.3%) and a specific incidence of complications (vascular aspiration or peritoneal puncture) of 0.05% (0.0054%–0.2000%). Neither of these complications resulted in additional interventions or sequelae. The median (95% range) for the local anesthetic dose per weight for bilateral TAP blocks was 1.0 (0.47–2.29) mg of bupivacaine equivalents per kilogram; however, subjects' weights were not sufficient to explain much of the variability in dose. One hundred thirty-five of 1944 (6.9%; 95% CI, 5.8%–8.1%) subjects received doses that could be potentially toxic. Subjects who received potentially toxic doses were younger than subjects who did not receive potentially toxic doses, 64 (19–100) months and 108 (45–158) months, respectively ($P < 0.001$).

CONCLUSIONS: The upper incidence of overall complications associated with the TAP block in children was 0.3%. More important, complications were very minor and did not require any additional interventions. In contrast, the large variability of local anesthetic dosage used can not only minimize potential analgesic benefits of the TAP block but also result in local anesthetic toxicity. Safety concerns should not be a major barrier to performing randomized trials to test the efficacy of the TAP block in children as long as appropriate local anesthetic dose regimens are selected.

海馬 tau 蛋白磷酸化在異氟醚誘導的 APP695 轉基因小鼠認知功能障礙中的作用

The Role of Hippocampal Tau Protein Phosphorylation in Isoflurane-Induced Cognitive Dysfunction in Transgenic APP695 Mice

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背景：以往研究表明，暴露於吸入麻醉藥可誘發認知功能障礙，這表明全身麻醉可能是造成阿爾茨海默病發展的風險因素。但基本的機制仍有待闡明。本研究測試了關於增強海馬 tua 蛋白磷酸化有助於異氟醚誘發阿爾茨海默病的小鼠模型產生認知功能障礙的假設。

方法：對 54 只雄性野生型（WT）小鼠（12 月齡）和 54 只雄性澱粉樣前體蛋白 695（APP695）小鼠（12 月齡），進行 1 個 MAC 的異氟醚麻醉 4 小時或者假麻醉（對照）處理。採用 Morris 水迷宮方法來測量小鼠的學習與記憶行爲。用定量免疫印跡法分析在 Ser262 位點的海馬 tau 蛋白磷酸化水準。

結果：Morris 水迷宮測試中，WT 小鼠和轉基因 APP695 小鼠在爲期 4 天的培訓中均表現爲潛伏期縮短。異氟醚暴露可顯著的延長 WT 小鼠在第 2 天及第 3 天的潛伏期，同時 APP695 小鼠在第 3 和第 4 天的潛伏期也顯著延長（WT：第 2 天 P = 0.005 和第 3 天 P =0.002; APP695：第 3 天 P =0.001，第 4 天 P<0.0001），並且兩種小鼠的平臺象限逗留時間均減少（WT：P <0.0001; APP695：P <0.0001）。與 WP 小鼠相比，轉基因 APP695 小鼠在異氟醚暴露後顯示出學習和記憶行爲明顯落後於前者（第 4 日：逃避潛伏期測試 P =0.0005，平臺探頭測試 P=0.009）。 免

疫印跡法表明，轉基因 APP695 小鼠位於 Ser262 位點上海馬 tau 蛋白的磷酸化水準（tau[pS262]）顯著高於 WP 小鼠（P <0.0001），而在這兩種類型的小鼠中海馬 tau 蛋白[高 pS262]的水準跟異氟醚暴露時間均呈依賴性正相關，但在轉基因 APP695 小鼠（P <0.0001）中更顯著。資料還顯示，異氟醚對所有的小鼠（P≥0.54）的海馬中的總 tau 蛋白表達沒有影響。
結論：異氟醚可能通過增強在 Ser262 位點的海馬 tau 蛋白磷酸化水準而誘發認知功能障礙，並且這種影響在轉基因 APP695 小鼠身上更爲顯著。
（秦懿 譯 陳傑 校）

BACKGROUND: Previous studies have shown that exposure to inhaled anesthetics can cause cognitive dysfunction, suggesting that general anesthesia might be a risk factor for the development of Alzheimer disease. However, the underlying mechanisms remain to be elucidated. In the present study, we tested our hypothesis that enhanced tau protein phosphorylation in hippocampus contributes to isoflurane-induced cognitive dysfunction in a mouse model of Alzheimer disease.

METHODS: Fifty-four male wild-type (WT) mice (12 months old) and 54 male amyloid precursor protein 695 (APP695) mice (12 months old) were either anesthetized for 4 hours with 1.0 minimum alveolar concentration isoflurane or sham-anesthetized (control). Learning and memory behaviors were measured using the Morris Water Maze test for mice. Phosphorylation of hippocampal tau protein at Ser262 site was analyzed with quantitative Western blotting.

RESULTS: In the Morris Water Maze test, both WT and transgenic APP695 mice showed decreased latency times during a 4-day training period. Isoflurane exposure significantly increased the latency times on days 2 and 3 in WT mice as well as on days 3 and 4 in APP695 mice (WT: $P = 0.005$ for day 2 and $P = 0.002$ for day 3; APP695: $P = 0.001$ for day 3 and $P < 0.0001$ for day 4) and reduced platform quadrant times (WT: $P < 0.0001$; APP695: $P < 0.0001$) in both types of mice. Compared with WT mice, transgenic APP695 mice displayed worse learning and memory behaviors after isoflurane exposure ($P = 0.0005$ for escape latency testing on day 4 training; $P = 0.009$ for platform probe testing). Western blot analysis showed that the levels of phosphorylation of hippocampal tau protein at Ser262 site (tau[pS262]) in the transgenic APP695 mice were higher than those in WT mice ($P < 0.0001$) and that isoflurane exposure time dependently enhanced the hippocampal tau[pS262] levels in both types of mice, but this effect was much more significant in the transgenic APP695 mice ($P < 0.0001$). Our data also showed that isoflurane exposure had no effect on the expression of total tau protein in the hippocampi of all mice ($P \geq 0.54$).

CONCLUSIONS: Isoflurane may induce cognitive dysfunction by enhancing phosphorylation of hippocampal tau protein at Ser262 site, and this effect is more significant in transgenic APP695 mice.

退伍軍人膝關節鏡檢查術後阿片類藥物的延長使用情況

Prolonged Opioid Use After Knee Arthroscopy in Military Veterans

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背景：慢性術後疼痛的發生率與擇期手術具有明顯相關性。已知的危險因素包括:圍手術期疼痛和創傷後應激障礙(PTSD)。退伍軍人往往存有 PTSD 的風險,因此手術後慢性疼痛的風險可能會增加。本研究目的是確認年輕退伍軍人在實施小型擇期外科手術後發生慢性術後疼痛的風險因素,包括 PTSD 的影響。

方法：本研究回顧了 2007 到 2010 間在退伍軍人管理局普吉灣健康保健系統中，行擇期膝關節鏡檢查的退伍軍人（18–50 歲）的醫療和用藥的記錄。資料包括人

口統計學，ASA 分級，術前合併症，麻醉藥物，和術前 3.5 個月及術後 3.5 個月阿片類藥物的使用。根據病人的問題清單或者臨床記錄來確定創傷後應激障礙的存在。將術後阿片類藥物的使用時間超過 3 個月作爲確認患者存在慢性術後疼痛。

結果：145 例患者符合納入標準。年齡中位數爲 39±8 歲。其中 87%的患者爲男性。PTSD 的患病率爲 32%（95%置信區間，25%–41%）。PTSD 的發生與吸煙（P = 0.009）及術前阿片類藥物的使用（P = 0.0006）呈正相關。44%(63/145)的患者在術前使用過阿片類藥物:其中 PTSD 患者與非 PTSD 患者的分別爲 64%(30/47）與 34%（33/98），兩者差異有統計學意義（P=0.0006）。30%（43/145）的患者被確定存在慢性術後疼痛。慢性術後疼痛的最強的獨立預測因數爲術前阿片類藥物的使用（比值比= 65.3；95%置信區間，14.5–293）。對於在術前沒有使用過阿片類藥物，年齡大於 27.5 歲的患者來說，PTSD 也可能是慢性術後疼痛的危險因素。
結論：此項單中心回顧性研究表明，慢性術後疼痛發生的最重要的因素是術前阿片類藥物的使用。而術前未使用阿片類藥物的患者，創傷後應激障礙可能會增加術後阿片類藥物使用的時間以及與患者年齡相關的慢性術後疼痛的潛在風險。

（殷文 譯 陳傑 校）

BACKGROUND: Chronic postoperative pain occurs with an appreciable incidence after elective surgery. Known risk factors include perioperative pain and posttraumatic stress disorder (PTSD). Military veterans are a population at particular risk for PTSD and hence may be at increased risk for chronic pain after surgery. Our goal was to identify risk factors for chronic postoperative pain in young veterans after minor elective surgery, including the contribution of PTSD.

METHODS: We reviewed the medical and pharmacy records of veterans (18–50 years old), undergoing elective knee arthroscopy from 2007 to 2010 at the Veteran's Administration Puget Sound Health Care System. The data included demographics, ASA physical status class, comorbidities, anesthesia medications, and opioid prescriptions starting 3.5 months before surgery and ending 3.5 months after surgery. We documented the presence of PTSD based on either the patient's problem list or the clinical notes. We used prolonged postoperative opioid prescription longer than 3 months after surgery as a surrogate for chronic postoperative pain.

RESULTS: We identified 145 patients who met inclusion criteria. The median age was 39 ± 8 years old. Eighty-seven percent of the patients were men. The prevalence of PTSD was 32% (95% confidence interval, 25%–41%). PTSD was associated with increased incidence of smoking (P = 0.009) and preoperative opioid use (P = 0.0006). Preoperative opioids were prescribed in 44% (63 of 145) of the patients: in 64% (30 of 47) of patients with PTSD, compared with 34% (33 of 98) in patients without PTSD (P = .0006). Chronic postoperative pain was identified in 30% (43 of 145) of patients. The strongest independent predictor of chronic postoperative pain was an opioid prescription before surgery (odds ratio = 65.3; 95% confidence interval, 014.5–293.0). In patients older than 27.5 years who did not receive opioids before surgery, PTSD may also have been a risk factor for chronic postoperative pain.

CONCLUSIONS: This single-center retrospective study suggests that the most important predictor of chronic postoperative pain is preoperative opioid use. For patients not taking opioids preoperatively, PTSD may increase the risk of prolonged postoperative opioid prescriptions and chronic postoperative pain, potentially related to patient age.

神經周圍注射普瑞巴林在大鼠神經病理性疼痛模型中鎮痛的新應用

Novel Use of Perineural Pregabalin Infusion for Analgesia in a Rat Neuropathic Pain Model

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背景：抗驚厥類藥物普瑞巴林和加巴噴丁常全身應用於一些慢性神經病理性疾病的治療。然而，一些患者因爲嚴重的藥物副作用而終止藥物治療。本文闡述了在大鼠神經病理性疼痛模型中，普瑞巴林可能通過作用於受損神經位點阻滯神經病理性疼痛。

方法：40 只雄性 SD 大鼠隨機分爲四組：坐骨神經擠壓傷後進行普瑞巴林神經周圍處理（治療組），擠壓傷後進行鹽水神經周圍處理（鹽水對照組），擠壓傷後進行普瑞巴林皮下給藥處理（全身用藥對照組），以及假手術處理（假手術組）。實驗動物分別接受 1%普瑞巴林（治療組和全身對照組）和鹽水（鹽水對照組）持續輸注 7 天，用雙足平衡測痛儀，防禦評分和熱輻射回縮潛伏期來測定疼痛行爲學變化(Hargreaves 法)，用免疫組織化學染色檢測神經上可能介導普瑞巴林中樞性鎮痛作用的 α(2)δ-1 受體。

結果：治療組防禦評分、雙足平衡測痛儀評分均優於全身用藥對照組和鹽水對照組($P < 0.0001$、$P \leq 0.001$)，而熱輻射法表明，各組受傷動物之間痛覺遲鈍情況沒有統計學差異($P = 0.80$)。免疫組織化學染色半定量分析表明所有神經損傷動物受損的神經位點處 α(2)δ-1 鈣通道表達情況是相同的。

結論：在神經病理性疼痛模型中，普瑞巴林神經周圍用藥的鎮痛效果優於其全身用藥。普瑞巴林的神經周圍用藥可能替代其全身用藥，成爲有效治療神經病理性疼痛的新方法。

（池曉穎 譯 陳傑 校）

BACKGROUND: The anticonvulsant drugs pregabalin and gabapentin are often used systemically to treat some forms of chronic neuropathic pain. However, many patients report side effects serious enough to cause discontinuation of the drug. Here we present evidence that pregabalin may block neuropathic pain when applied to the site of nerve injury in a rat neuropathic pain model.

METHODS: Forty male Sprague Dawley rats were randomized into 4 groups: sciatic nerve crush injury with perineural pregabalin treatment (treatment), crush injury with perineural saline treatment (saline control), crush injury with subcutaneous pregabalin treatment (systemic drug control), and sham surgery (sham surgery control). Animals received either continuous infusions of 1% pregabalin for 7 days (treatment and systemic control) or saline (saline control) and were tested for pain behaviors using incapacitance meter, guarding scores, and radiant heat withdrawal latency (Hargreaves method). Nerves were studied using histology and immunohistochemistry for α(2)δ-1 receptors thought to mediate the central analgesic action of pregabalin.

RESULTS: Treatment rats had significantly better guarding scores than systemic drug controls or saline controls ($P < 0.0001$) and had significantly better incapacitance scores than systemic drug controls and saline controls ($P \leq 0.001$). Hargreaves method data showed hypoalgesia in all injured animals with no difference among injured groups ($P = 0.80$). Qualitatively, immunohistochemistry likely showed equivalent expression of the α(2)δ-1 calcium channel at the injured nerve site in all nerve-injured animals.

CONCLUSIONS: Perineural pregabalin administration produced superior analgesia compared with that of systemic pregabalin in this neuropathic pain model. Perineural pregabalin treatment may provide a useful alternative to systemic pregabalin treatment for neuropathic pain.

尼古丁對患者術後鎮痛的影響：一項系統性回顧和系統評價

Nicotine for Postoperative Analgesia: A Systematic Review and Meta-Analysis

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背景：圍術期尼古丁的使用通常是做爲一種輔助鎮痛藥和預防術後噁心嘔吐(PONV)的可能形式來研究的.我們所做的系統性回顧是來評估圍術期管理中尼古丁在術後疼痛及術後噁心嘔吐方面的影響。

方法：應用於 MEDLINE、CENTRAL、EMBASE 和 CINAHL 資料庫的文獻檢索採用隨機對照的方法來調查尼古丁相較於安慰劑在全麻術後患者的疼痛和噁心嘔吐方面影響的不同。研究中使用了隨機效應模型。最終首要目的是其累計鎮痛藥消耗量和術後 24 小時的疼痛評分。

結果：共進行了 9 項研究（662 例患者）。其中 6 項使用的是尼古丁透皮貼劑，另外 3 項是尼古丁鼻部噴霧。4 項研究中僅爲女性患者，同時 7 項研究中是不吸煙者。圍術期尼古丁使用使得術後 24 小時內累積阿片類鎮痛藥消耗量與控制組相比減少(平均差= -4.85 mg 等量嗎啡, 95% 置信區間[CI], = -9.40 到 -0.30, P = 0.04)。疼痛評分在臨床上和統計學上均沒有減少。尼古丁組的術後噁心率發生顯著增高(相對危險度= 1.26, 95% CI, = 1.05 to 1.52)同時在術後一小時需要止吐藥干預(相對危險度= 1.54, 95% CI, = 1.37 to 1.74)，術後 24 小時術後噁心發生率顯著增高(相對危險度= 1.14, 95% CI, = 1.02 to 1.28).術後 24 小時阿片類鎮痛藥的使用僅僅見於不吸煙者。當排除一組高危偏差，尼古丁仍然表現出更高的術後 24 小時噁心率(相對危險度= 1.15, 95% CI, = 1.05 to 1.25)。

結論：這項系統回顧可以看出，圍術期尼古丁的使用使得術後 24 小時阿片類藥物累計使用量減少、疼痛評分降低，二者均有顯著統計學意義，圍術期尼古丁的使用也增加了全麻患者術後噁心的發生率。阿片類藥物缺乏效應似乎僅限於不吸煙者。當前資料並不支援尼古丁在圍術期鎮痛中的使用。

（趙曉 譯 李士通 校）

BACKGROUND The perioperative adminstration of nicotine has been investigated as an analgesic adjunct and a possible modality to prevent postoperative nausea and vomiting (PONV).

We performed this systematic review to assess the impact of perioperative administration of nicotine on postoperative pain and PONV.

METHODS A literature search of MEDLINE, CENTRAL, EMBASE, and CINAHL was done for randomized controlled trials that investigated the effects of nicotine compared with placebo regarding postoperative pain and/or PONV in patients undergoing surgery under general anesthesia. A random effects model was used for analysis. The primary end points were cumulative analgesic consumption and pain scores at 24 hours after surgery.

RESULTS Nine studies (662 patients) were included. Nicotine was administered as a transdermal patch in 6 studies and as a nasal spray in 3. Four studies recruited only women while 7 recruited only nonsmokers.Perioperative nicotine administration was associated with a reduction in cumulative opioid consumption at 24 hours compared with control (mean difference = -4.85 mg morphine equivalents, 95% confidence interval [CI], = -9.40 to -0.30, P = 0.04).Pain scores were neither clinically nor statistically reduced. Nicotine was associated with a significantly higher incidence of postoperative nausea (relative risk = 1.26, 95% CI, = 1.05 to 1.52) and need for rescue antiemetics (relative risk = 1.54, 95% CI, = 1.37 to 1.74) during the first postoperative hour and significantly higher postoperative nausea at 24 hours (relative risk = 1.14, 95% CI, = 1.02 to 1.28). The 24 hours opioid sparing was only seen in nonsmokers. When excluding 1 study with high risk of bias, nicotine was still associated with more postoperative nausea at 24 hours (relative risk = 1.15, 95% CI, = 1.05 to 1.25).

CONCLUSIONS This systematic review suggests that perioperative nicotine administration was associated with a statistically significant reduction in cumulative opioid consumption at 24 hours and a statistically insignificant reduction in pain scores at 24 hours.Perioperative nicotine was also associated with an increased

incidence of postoperative nausea in patients undergoing surgery under general anesthesia. The opioid-sparing effect seemed to be limited to nonsmokers. Current data do not support a role for nicotine in perioperative analgesia.

肥胖患者的丙泊酚靶控輸注模式效能：藥代動力學和藥效動力學分析

Performance of Propofol Target-Controlled Infusion Models in the Obese: Pharmacokinetic and Pharmacodynamic Analysis

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背景：肥胖者機體發生了重要生理改變，可潛在的影響了麻醉藥物的藥代動力學（PK）和藥效動力學（PD）。我們設計這個研究來評估 5 種當前可用的丙泊酚藥代動力學模式在過度肥胖患者的預測性表現，同時找出這類群體特徵性的腦電雙頻指數（BIS）反應。

方法：研究物件爲 20 名 20~60 歲的肥胖患者（體重指數>35 kg/m），擬擇期行腹腔鏡肥胖外科手術。麻醉方案採用丙泊酚靶控輸注複合瑞芬太尼手控輸注。記錄下 BIS 數值和丙泊酚輸注方案。動脈血樣分別在開始時、維持期及術後 2 小時採集來測量丙泊酚含量。計算 MDPEs 和 MDAPEs 來監測該模型性能。研發出的 PKPD 模式使用了 NONMEM 來反映出丙泊酚在複合瑞芬太尼情況下的濃度-BIS 動態關係的特徵趨勢。

結果：20 名肥胖者（平均體重：106kg,範圍：85-141 kg；平均年齡: 33.7 歲, 範圍: 21-53 歲; 平均體重指數: 41.4 kg/m, 範圍: 35-52 kg/m）。共收集了 294 份動脈血樣本、分析了 1431 個 BIS 測量值。當全身體重（TBW）做爲患者體重來錄入，Eleveld 異速生長模式出現了最好的結果（P < 0.0001），MDPE MDPE = 18.2%、MDAPE = 27.5%。但是，5 種經過測試的藥代動力學模式，卻反映出低估丙泊酚濃度的趨勢。用經校正過的體重在 Schnider and Marsh 模式下改良了兩種模式，使其達到最低預測錯誤率(MDPE = <10% and MDAPE = <25%; all P < 0.0001)。將一個 3 隔藥代動力學模式通過一階速率常數置於反曲的禁止 Emax 藥效動力學模型能夠充分的描繪出丙泊酚濃度-BIS 數值變化。一個滯後時間參數爲 0.44 分鐘(SE = 0.04 minutes)用來解釋適當改良的 BIS 值反應時間的延長。在我們的研究中，典型的患者複合瑞芬太尼情況下，類似的靶向效應濃度爲 3.2 μg/mL (SE = 0.17 μg/mL)時預計 BIS 值爲 50.

結論：Eleveld 異速生長藥代動力學模式證實使用 TBW 時，其優於其他所有測試模式。但是，所有的模式都有低估丙泊酚濃度的傾向。傳統的 Schnider and Marsh 模式中用校正的體重替代 TBW 顯著的改進了其性能，在所有的模式中達到了最低的預測錯誤率。我們的研究認爲，肥胖患者在時間上的 BIS 反應與丙泊酚濃度-BIS 關係之間不存在相關聯繫。

（趙曉 譯 李士通 校）

BACKGROUND Obesity is associated with important physiologic changes that can potentially affect the pharmacokinetic (PK) and pharmacodynamic (PD) profile of anesthetic drugs. We designed this study to assess the predictive performance of 5 currently available propofol PK models in morbidly obese patients and to characterize the Bispectral Index (BIS) response in this population.

METHODS Twenty obese patients (body mass index >35 kg/m), aged 20 to 60 years, scheduled for laparoscopic bariatric surgery, were studied.Anesthesia was administered using propofol by target-controlled infusion and remifentanil by manually controlled infusion. BIS data and propofol infusion schemes were recorded. Arterial blood samples to measure propofol were collected during induction, maintenance, and the first 2 postoperative hours. Median performance errors (MDPEs)

and median absolute performance errors (MDAPEs) were calculated to measure model performance. A PKPD model was developed using NONMEM to characterize the propofol concentration-BIS dynamic relationship in the presence of remifentanil.

RESULTS We studied 20 obese adults (mean weight: 106 kg, range: 85-141 kg; mean age: 33.7 years, range: 21-53 years; mean body mass index: 41.4 kg/m, range: 35-52 kg/m).We obtained 294 arterial samples and analyzed 1431 measured BIS values. When total body weight (TBW) was used as input of patient weight, the Eleveld allometric model showed the best (P < 0.0001) performance with MDPE = 18.2% and MDAPE = 27.5%. The 5 tested PK models, however, showed a tendency to underestimate propofol concentrations. The use of an adjusted body weight with the Schnider and Marsh models improved the performance of both models achieving the lowest predictive errors (MDPE = <10% and MDAPE = <25%; all P < 0.0001). A 3-compartment PK model linked to a sigmoidal inhibitory Emax PD model by a first-order rate constant (ke0) adequately described the propofol concentration-BIS data. A lag time parameter of 0.44 minutes (SE = 0.04 minutes) to account for the delay in BIS response improved the fit.A simulated effect-site target of 3.2 μg/mL (SE = 0.17 μg/mL) was estimated to obtain BIS of 50, in the presence of remifentanil, for a typical patient in our study.

CONCLUSIONS The Eleveld allometric PK model proved to be superior to all other tested models using TBW. All models, however, showed a trend to underestimate propofol concentrations.The use of adjusted body weight instead of TBW with the traditional Schnider and Marsh models markedly improved their performance achieving the lowest predictive errors of all tested models. Our results suggest no relevant effect of obesity on both the time profile of BIS response and the propofol concentration-BIS relationship.

持續無創血紅蛋白監測的精確性研究：一項系統性回顧和 Meta 分析

Accuracy of Continuous Noninvasive Hemoglobin Monitoring: A Systematic Review and Meta-Analysis

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背景：無創血紅蛋白（Hb）監測裝置在臨床中應用廣泛，但其相對於中心實驗室 Hb 檢測的準確性和精確度缺少系統性回顧和 Meta 分析評估。

方法：我們對 2005 年至 2013 年 8 月間收錄於 Pubmed、Web of Science 和 Cochrane Library 的文獻進行了全面搜索，對檢索到的文獻進行回顧分析，並聯繫作者以確定無創 Hb 監測相對於中心實驗 Hb 檢驗的準確性。2 篇獨立的綜述評估了這些研究的特性。採用隨機效應模型計算這些研究的總平均差和標準差(SD)（95%置信區間）。採用 I^2 統計量評估異質性。

結果：總共 32 個研究（4425 位元受試者，樣本中位數 44，每個研究 10-569 位病人）納入 Meta 分析。總混合隨機效應平均差（無創-中心實驗室）和 SD 爲 0.10 ± 1.37 g/dL (-2.59 to 2.80 g/dL, I^2 = 95.9% for mean difference and 95.0% for SD)。亞組分析中，13 個圍術期研究的總平均差和 SD 爲 0.39 ± 1.32 g/dL (-2.21 to 2.98 g/dL, I^2 = 93.0%, 71.4%)；5 個重症監護室研究的總平均差和 SD 爲-0.51 ± 1.59 g/dL (-3.63 to 2.62 g/dL, I^2 = 83.7%, 96.4%)。

結論：儘管無創 Hb 和中心實驗室檢測之間的平均差較小，當基於無創 Hb 做臨床決定時，臨床醫生應該注意較寬的置信區間。

(江繼宏 譯 李士通 校）

BACKGROUND Noninvasive hemoglobin (Hb) monitoring devices are available in

the clinical setting, but their accuracy and precision against central laboratory Hb measurements have not been evaluated in a systematic review and meta-analysis.

METHODS We conducted a comprehensive search of the literature (2005 to August 2013) with PubMed, Web of Science and the Cochrane Library, reviewed references of retrieved articles, and contacted manufactures to identify studies assessing the accuracy of noninvasive Hb monitoring against central laboratory Hb measurements. Two independent reviewers assessed the quality of studies using recommendations for reporting guidelines and quality criteria for method comparison studies. Pooled mean difference and standard deviation (SD) (95% limits of agreement) across studies were calculated using the random-effects model. Heterogeneity was assessed using the I statistic.

RESULTS A total of 32 studies (4425 subjects, median sample size of 44, ranged from 10 to 569 patients per study) were included in this meta-analysis. The overall pooled random-effects mean difference (noninvasive-central laboratory) and SD were 0.10 ± 1.37 g/dL (-2.59 to 2.80 g/dL, I = 95.9% for mean difference and 95.0% for SD). In subgroup analysis, pooled mean difference and SD were 0.39 ± 1.32 g/dL (-2.21 to 2.98 g/dL, I = 93.0%, 71.4%) in 13 studies conducted in the perioperative setting and were -0.51 ± 1.59 g/dL (-3.63 to 2.62 g/dL, I = 83.7%, 96.4%) in 5 studies performed in the intensive care unit setting.

CONCLUSIONS Although the mean difference between noninvasive Hb and central laboratory measurements was small, the wide limits of agreement mean clinicians should be cautious when making clinical decisions based on these devices.

富氫鹽水改善心臟停搏和心肺復蘇後大鼠的存活率和神經學結果

Hydrogen-Rich Saline Improves Survival and Neurological Outcome After Cardiac Arrest and Cardiopulmonary Resuscitation in Rats

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背景：心搏驟停是人類死亡的主要原因。75%的心臟停搏病人入院前已經死亡，或者出現明顯的神經損傷。具有便攜、易於管理、安全輸送氫氣裝置特點的富氫鹽水，可以通過調節氧化應激、炎症和凋亡可以產生器官保護作用。我們在本實驗中研究富氫鹽水治療是否能夠改善心臟停搏和心肺復蘇後大鼠的存活率和神經學結果，並探索期其可能機制。

方法：SD 大鼠接受窒息產生 8 分鐘心臟停搏。心肺復蘇前 1 分鐘、自主迴圈建立後的第 6 小時和 12 小時分別通過靜脈給予大鼠不同劑量的富氫鹽水和生理鹽水。評估大鼠生存率、神經學結果、氧化應激、炎症標記物以及凋亡等指標。

結果：富氫鹽水治療劑量依賴性改善心臟停搏復蘇後大鼠生存率和神經學功能。此外，富氫鹽水治療劑量依賴性減輕心臟停搏復蘇後腦損傷，表現爲增加海馬 CA1 區神經元存活率、減輕皮層和海馬區腦水腫，保護血腦屏障完整性，以及減少血清 S100β 和神經元特異烯醇化酶。而且，我們發現富氫鹽水的有益作用與減輕血清及腦組織中的氧化產物（8-異前列腺素 F2α 和丙二醛）、炎症因數（TNF-α，IL-1β，HMGB-1）以及增加抗氧化酶（超氧化物歧化酶和過氧化氫）有關。另外，富氫鹽水治療能夠減輕心臟停搏復蘇後皮層和海馬中 caspase-3 活性。

結論：富氫鹽水治療改善心臟停搏復蘇後大鼠生存率和神經學結果，其部分通過減輕氧化應激、炎症和凋亡介導。

(江繼宏 譯　李士通 校）

BACKGROUND Sudden cardiac arrest is a leading cause of death worldwide. Three-fourths of cardiac arrest patients die before hospital discharge or experience significant neurological damage. Hydrogen-rich saline, a portable, easily administered, and safe means of delivering hydrogen gas, can exert organ-protective effects through regulating oxidative stress, inflammation, and apoptosis. We designed this study to investigate whether hydrogen-rich saline treatment could improve survival and neurological outcome after cardiac arrest and cardiopulmonary resuscitation, and the mechanism responsible for this effect.

METHODS Sprague-Dawley rats were subjected to 8 minutes of cardiac arrest by asphyxia. Different doses of hydrogen-rich saline or normal saline were administered IV at 1 minute before cardiopulmonary resuscitation, followed by injections at 6 and 12 hours after restoration of spontaneous circulation, respectively. We assessed survival, neurological outcome, oxidative stress, inflammation biomarkers, and apoptosis.

RESULTS Hydrogen-rich saline treatment dose dependently improved survival and neurological function after cardiac arrest/resuscitation. Moreover, hydrogen-rich saline treatment dose dependently ameliorated brain injury after cardiac arrest/resuscitation, which was characterized by the increase of survival neurons in hippocampus CA1, reduction of brain edema in cortex and hippocampus, preservation of blood-brain barrier integrity, as well as the decrease of serum S100β and neuron-specific enolase. Furthermore, we found that the beneficial effects of hydrogen-rich saline treatment were associated with decreased levels of oxidative products (8-iso-prostaglandin F2α and malondialdehyde) and inflammatory cytokines (tumor necrosis factor-α, interleukin-1β, and high-mobility group box protein 1), as well as the increased activity of antioxidant enzymes (superoxide dismutase and catalase) in serum and brain tissues. In addition, hydrogen-rich saline treatment reduced caspase-3 activity in cortex and hippocampus after cardiac arrest/resuscitation.

CONCLUSIONS Hydrogen-rich saline treatment improved survival and neurological outcome after cardiac arrest/resuscitation in rats, which was partially mediated by reducing oxidative stress, inflammation, and apoptosis.

Pierre Robin 序列征：一項圍術期綜述

Pierre Robin Sequence: A Perioperative Review

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臨床中三聯征小頜畸形（小下顎），舌後墜（向後，舌位置不正），氣道阻塞被定義爲 Pierre Robin 序列征（Pierre Robin Sequence ，PRS）。氣道阻塞和呼吸窘迫是臨床性標誌。病人可以表現爲喘鳴，發紺。嚴重的氣道阻塞可引起進食困難，反流，不能呼吸。治療方案依賴氣道阻塞的嚴重性，包括俯臥位，鼻咽道，舌嘴唇的粘附力，下頜骨的牽引骨生成，氣管造口術。患有 PRS 的新生嬰兒和成人的護理涉及多個專業包括麻醉學，整形學，耳鼻喉科學，語言病理學，胃腸病學，放射學，新生兒學。麻醉醫師涉及 PRS 患者的護理要和多學科臨床合作。術前訪視要與多個專業合作包括麻醉科，整形科，耳鼻咽喉科，語言科，我們就背景和 PRS 的患者臨床表現探討一下以及關於護理的爭議。

(王曉莉 譯　李士通 校）

The clinical triad of micrognathia (small mandible), glossoptosis (backward, downward displacement of the tongue), and airway obstruction defines the Pierre Robin sequence (PRS). Airway obstruction and respiratory distress are clinical hallmarks. Patients may present with stridor, retractions, and cyanosis. Severe

obstruction results in feeding difficulty, reflux, and failure to thrive. Treatment options depend on the severity of airway obstruction and include prone positioning, nasopharyngeal airways, tongue lip adhesion, mandibular distraction osteogenesis, and tracheostomy. The neonate and infant with PRS require care from multiple specialists including anesthesiology, plastic surgery, otolaryngology, speech pathology, gastroenterology, radiology, and neonatology. The anesthesiologist involved in the care of patients with PRS will interface with a multidisciplinary team in a variety of clinical settings. This perioperative review is a collaborative effort from multiple specialties including anesthesiology, plastic surgery, otolaryngology, and speech pathology. We will discuss the background and clinical presentation of patients with PRS, as well as some of the controversies regarding their care.

三種雙腔支氣管導管置換難易的模擬試驗

A Simulator Study of Tube Exchange with Three Different Designs of Double-Lumen Tubes

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背景：本文旨在探討可視喉鏡下三種雙腔支氣管導管(DLT) (Rusch, Mallinckrodt, Fuji)通過氣管導管置換器(AEC)置入氣道的難易程度。

方法：爲了方便，我們從多倫多的一個教學醫院招募了 17 名至少有三年麻醉工作經驗的麻醉科住院醫生和研究員參與我們的這個隨機交叉試驗。每個受試者向模擬人氣管裡通過 AEC 分別置入每種 DLT，並通過可視喉鏡記錄整個置入的過程。DLT 置入氣管的順序是由隨機盲目地從盒子中抽 DLT 廠家名字決定的。我們主要的觀察結果是置管時間（從可視喉鏡螢幕中見著支氣管腔到管腔進入聲門的時間）。同時記錄受試者主觀感覺置入的難易程度及失敗率（嘗試 2 分半鐘未成功置管即爲失敗）。

結果：使用 Fuji-Phycon DLT 的置管時間(平均兩秒鐘)要快於 Rusch (平均 27 秒 P = 0.0144) 和 Mallinckrodt (平均 21 秒 P = 0.0117). 把置管難易程度分爲 1-1O 分，10 分最容易，1 分最難，結果表明使用 Fuji-Phycon 被認爲是最容易的(平均 10 分) ，而 Rusch 平均 3 分,（ P = 0.0186) ，Mallinckrodt 平均 4 分（ P = 0.0123). 使用 Rusch 的置管失敗率明顯高於另外兩種 DLT（P = 0.002）。

結論：在這個模擬人試驗中，與其他雙腔支氣管導管相比，Fuji-Phycon 能更容易的通過置換器置入氣道。因此 Fuji-Phycon 雙腔支氣管導管可值得考慮應用于單肺通氣困難氣道的患者。

（王慧娟 譯　李士通 校）

BACKGROUND We sought to determine whether the design of 3 different double-lumen endobronchial tubes (DLT) (Rusch, Mallinckrodt, Fuji) has an effect on the ease of placement over an airway exchange catheter (AEC) using a video laryngoscope.

METHODS A convenience sample of 17 anesthesia residents and fellows with at least 3 years of anesthesia training was recruited from teaching hospitals in Toronto for a randomized crossover trial. Each participant passed each DLT over an AEC in an airway simulator, visualized and video recorded via a video laryngoscope (GlideScope). The order of exchange was randomized by blindly pulling the name of the manufacturer of a DLT from a box. The primary outcome was time to intubate, defined as time from the bronchial lumen entering the GlideScope view to the bronchial lumen passing the vocal cords. Also recorded were participants' subjective rating of the ease of use and failure rate, defined as an attempt >150-second duration.

RESULTS Time to intubate was faster with the Fuji-Phycon DLT (median 2 seconds) compared with both the Rusch (median 27 seconds, P = 0.0144) and Mallinckrodt

(median 21 seconds, P = 0.0117). On a scale of 1 to 10, with 10 being very easy to use and 1 being very difficult, the Fuji-Phycon was judged to be easier to use (median 10 seconds) compared with the Rusch (median 3, P = 0.0186) and the Mallinckrodt (median 4 seconds, P = 0.0123). The Rusch was associated with significantly more failures than the other DLTs, P = 0.002.

CONCLUSIONS The Fuji-Phycon DLT was easier to pass over an AEC in this simulator trial and warrants consideration in patients with difficult airways who require 1-lung ventilation

抑制在動作電位產生中起多種作用的鈉、鉀通道是利多卡因對脊髓背角神經元亞型細胞的主要作用機制

Mechanisms of Lidocaine's Action on Subtypes of Spinal Dorsal Horn Neurons Subject to the Diverse Roles of Na+ and K+ Channels in Action Potential Generation

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背景：脊髓背角淺層神經元接收來自 Aδ 神經纖維和 C 纖維的感覺資訊。根據它們對持續去極化的反應將神經元分爲三種：強直放電神經元(TFN),適應神經元(AFN)和單穗放電神經元(SSN)。在利多卡因脊麻時，這些神經元接接觸到的利多卡因的濃度是不盡相同的。本實驗探討利多卡因濃度對感覺神經元興奮性的影響。

方法：我們用全細胞膜片法記錄到的大鼠脊髓背角神經元來研究利多卡因對興奮性的影響。爲了評估被利多卡因(100 μM)封鎖的幾種電壓門控性鉀通道對不同神經元興奮性的影響，利多卡因對鈉通道和鉀通道的抑制作用依據河豚毒素和四乙基銨對其影響的機制來探討。統計分析用配對設計符號秩檢驗。

結果：在利多卡因的作用下，三種神經元的動作電位形狀都發生了變化。單個動作電位的最大振幅降低了(SSN, AFN,和 TFN 的 P 值分別爲 0.031,0.013,和 0.014)。動作電位持續時間延長了(SSN, AFN,和 TFN的P 值分別爲 0.016, 0.032, 0.031)。在使用了利多卡因後，動作電位最大正斜率(P_{SSN}= 0.016 ，P_{TFN} = 0.0010 ）和負斜率（ P_{SSN} = 0.016, P_{AFN} = 0.0025, and P_{TFN} = 0.020）都減小了。利多卡因減少了強直放電神經元的重複放電，類似於河豚毒素和四乙基銨合用時的作用。河豚毒素和利多卡因對單穗放電神經元的作用相仿。

結論：低濃度利多卡因通過作用於電壓門控鉀通道對強直放電神經元有抑制作用，而對適應性神經元影響是通過抑制電壓門控鈉通道。然而單穗放電神經元的放電模式未受到利多卡因的影響。 對低濃度的鈉通道阻滯劑尤其是鉀通道阻滯劑的敏感性不同說明可能對於不同的脊髓背角神經元需用不同的阻滯劑。

（王慧娟 譯　李士通 校）

BACKGROUND:Superficial dorsal horn neurons of the spinal cord receive sensory information from Aδ and C fibers. According to their response to sustained depolarization, these cells can be divided into 3 groups: tonic (TFN), adapting (AFN), and single spike firing (SSN) neurons. During spinal and systemic administration of lidocaine, these neurons are exposed to different concentrations of the local anesthetic lidocaine. In this study, we explored its effect on the excitability of sensory neurons.

METHODS:Whole-cell patch-clamp recordings from dorsal horn neurons of Wistar rats were used to study the action of lidocaine on firing properties. To estimate the impact of a blockade of voltage-gated potassium channels by lidocaine (100 μM) on the firing properties of different neurons, the sodium and potassium channel inhibition of lidocaine was investigated in the light of the effects of tetrodotoxin (TTX, 10 nM) and tetraethylammonium (10 mM). For statistical analysis, the Wilcoxon

matched-pairs signed rank test was used throughout.

RESULTS:All 3 types of neurons responded to lidocaine with changes in the shape of their action potentials. The peak amplitude of the single action potentials was decreased (P = 0.031, P = 0.013, and P = 0.014 for SSN, AFN, and TFN neurons, respectively), and the duration of the action potentials was increased (P = 0.016, P = 0.032, and P = 0.031 for SSN, AFN, and TFN neurons, respectively). The maximum positive slope (P = 0.016 and P = 0.0010 for SSN and AFN, respectively) and the negative slope (P = 0.016, P = 0.0025, and P = 0.020 for SSN, AFN, and TFN neurons, respectively) decreased after application of lidocaine. In tonically firing neurons, lidocaine reduced the repetitive firing (P = 0.0016), and this effect was mimicked by a combination of TTX and tetraethylammonium. In AFN, TTX mimicked the action of lidocaine.

CONCLUSIONS:Lidocaine at low concentrations suppresses tonic firing neurons by interacting with voltage-gated potassium channels. The effects on adapting firing neurons can be explained by an interaction with voltage-gated sodium channels. In contrast, the firing pattern of SSN is not affected at the administered concentrations. This different sensitivity to low concentrations of sodium and particularly of potassium channel blockers might represent a novel approach for a differentiated blockade of different spinal dorsal horn neurons.

局麻藥對坐骨神經雙重阻滯的起始時間及持續時間的影響：一個預期的、隨機的、單盲的研究

Effect of Local Anesthetic Dilution on the Onset Time and Duration of Double-Injection Sciatic Nerve Block: A Prospective, Randomized, Blinded Evaluation

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背景：在所有影響成功率的因素中，周圍神經阻滯的起始時間和持續時間仍然不確定。在這項預期的、隨機的、單盲的研究中，我們主要評估改變固定劑量的甲呱卡因溶液的稀釋濃度是否會影響坐骨神經阻滯的起始時間和持續時間。

方法：90 個 ASA 評分 I-II 級行足部手術的患者被隨機收集來分別接受用 12ml 2% 甲呱卡因（45 人）和 24ml 1%甲呱卡因（45 人）誘導的坐骨神經雙重阻滯。神經刺激器設置的初始值爲 2Hz，0.1 毫秒,1mA。局麻藥的總量（240mg）保持不變被平均分配到腓骨和脛骨神經。所有的病人都接受一個超聲引導下膕坐骨神經導管植入術來行術後鎮痛。記錄手術準備、效能維持及局麻藥補充的次數。 我們最主要的終點事件是確定各組間局麻藥消耗時間的差異。我們用連續變數來表示中值並將它與 Wilcoxon-Mann-Whitney U 測試相比較。WMWodds 和他們 95% 的可信區間一起被報導。

結果：所有研究中坐骨神經阻滯的成功率爲 99%。第 I 組人群中作用時間爲 120s，比第 II 組人群的作用時間（150s）縮短。第 I 組人群坐骨神經感覺和運動阻滯的起始時間爲 4 分鐘，第 II 組爲 6 分鐘。而第 I 組感覺阻滯的維持時間爲 235 分鐘，第 II 組爲 240 分鐘。

結論：我們沒有發現證據表明改變一個固定總劑量甲呱卡因的體積和濃度會改變坐骨神經阻滯的起始時間和持續時間。考慮我們的 WMWodds 結果,可能不同的起始時間和持續時間與性能之間的差異不能排除。

（王曉莉 譯　李士通 校）

BACKGROUND: Among the various factors influencing the success rate, onset time, and duration of peripheral nerve blocks, the role of local anesthetics concentration remains uncertain. In this prospective, randomized, single-blinded study, we evaluated

whether varying the dilution of a fixed dose of mepivacaine solution influenced onset time and duration of sciatic nerve block.

METHODS: Ninety ASA physical status I to II patients scheduled for foot surgery were randomly allocated to receive a double-injection Labat sciatic nerve block with 12 mL mepivacaine 2% (group concentration I = 45 patients) or 24 mL of mepivacaine 1% (group volume II = 45 patients). The nerve stimulator was initially set at 2 Hz, 0.1 millisecond, 1 mA. The total amount of local anesthetic (240 mg) was kept constant and equally divided between the peroneal and tibial nerves. All patients also received an ultrasound-guided popliteal sciatic nerve catheter for postoperative analgesia. Times to readiness for surgery, performance, and offset of local anesthetic were recorded. Our primary end point was to determine a possible difference in offset time between groups. Continuous variables were expressed as median (IQR) and compared with the Wilcoxon-Mann-Whitney U test; WMWodds are reported together with their 95% confidence interval.

RESULTS: The overall success rate of sciatic nerve block was 99%. Time of performance was shorter in group I, 120 seconds (90–150 seconds), than that in group II, 150 seconds (120–180 seconds) (P = 0.0048; WMWodds 2.26 [1.35–4.34]). The onset time of sensory and motor sciatic nerve block was 4 minutes (2–9 minutes) in group I and 6 minutes (4–10 minutes) in group II (P = 0.41; WMWodds 1.21 [0.77–1.95]), while the duration of sensory block was 235 minutes (203–250 minutes) in group I, and 240 minutes (218–247 minutes) in group II respectively (P = 0.51; WMWodds 1.20 [0.69–2.16]).

CONCLUSIONS: We found no evidence that varying volume and concentration while maintaining a fixed total dose of mepivacaine alters the onset time and duration of double-injection sciatic nerve block. Considering our WMWodds results, possible differences in onset time and duration comparable to differences in the performance time between groups cannot be excluded.