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溫度降低對凝血酶生成影響的電腦分析：低體溫在凝血功能障礙中所起的作用

Computational Analysis of the Effects of Reduced Temperature on Thrombin Generation: The Contributions of Hypothermia to Coagulopathy

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背景：由組織低灌注、軀體暴露和輸注低溫復蘇液引起的低體溫，是導致創傷和手術期間凝血功能障礙的主要因素。儘管進行了大量研究，但低體溫引起凝血功能受損的機制尚未完全明確。本研究利用動力學模型探究低體溫對凝血酶生成的影響。

方法：研究採用一經驗證的電腦模型預測和分析了低體溫（伴隨或不伴隨血液稀釋）對凝血酶生成和其量化指標的影響。電腦模型反映了關於凝血酶生成生化機制的機理說明的現有知識。研究對“每個”受試者進行分析，包括 472 例來自“萊頓血栓形成研究”對照組中的受試者。

結果：計算和分析了數以千計的動力學曲線，這些曲線特徵性反映了凝血酶生成和凝血酶原複合物（TAT）的形成。在任何類比情況下，31℃ 至 36℃ 的低體溫時，凝血酶生成逐漸減緩，可通過凝血時間、凝血酶高峰時間和凝血酶原時間所反映，這些指標在所有受試者中均延長($P < 10^{-5}$)。凝血酶曲線的最大斜率逐漸減小，曲線下面積在低體溫狀態下增大($P < 10^{-5}$)；凝血酶峰值高度幾乎不受影響。TAT 形成時間明顯延長($P < 10^{-5}$)，但最終 TAT 水準無顯著影響。影響凝血酶生成的參數中，酶折疊方式在較低體溫時改變更大。儘管實驗組差異很大，但此與參數本身和受試者凝血因數組成成分無關。低體溫和血液稀釋對凝血酶生成有關的參數的影響呈相加作用。

結論：此項電腦策略可被用於類比改變溫度對生化系統的動力學影響，並被用於分析低體溫對凝血酶生成的影響。研究發現在不同血漿組成的個體中，即使在輕

度低體溫時，凝血酶生成受損也很明顯。研究指出凝血酶生成障礙的機制，這可能是由低體溫引起和血液稀釋參與的凝血功能障礙的主要因素。
（諸琳婕　譯　陳傑　校）

BACKGROUND: Hypothermia, which can result from tissue hypoperfusion, body exposure, and transfusion of cold resuscitation fluids, is a major factor contributing to coagulopathy of trauma and surgery. Despite considerable efforts, the mechanisms of hypothermia-induced blood coagulation impairment have not been fully understood. We introduce a kinetic modeling approach to investigate the effects of hypothermia on thrombin generation.

METHODS: We extended a validated computational model to predict and analyze the impact of low temperatures (with or without concomitant blood dilution) on thrombin generation and its quantitative parameters. The computational model reflects the existing knowledge about the mechanistic details of thrombin generation biochemistry. We performed the analysis for an "average" subject, as well as for 472 subjects in the control group of the Leiden Thrombophilia Study.

RESULTS: We computed and analyzed thousands of kinetic curves characterizing the generation of thrombin and the formation of the thrombin–antithrombin complex (TAT). In all simulations, hypothermia in the temperature interval 31℃ to 36℃ progressively slowed down thrombin generation, as reflected by clotting time, thrombin peak time, and prothrombin time, which increased in all subjects ($P < 10^{-5}$). Maximum slope of the thrombin curve was progressively decreased, and the area under the thrombin curve was increased in hypothermia ($P < 10^{-5}$); thrombin peak height remained practically unaffected. TAT formation was noticeably delayed ($P < 10^{-5}$), but the final TAT levels were not significantly affected. Hypothermia-induced fold changes in the affected thrombin generation parameters were larger for lower temperatures, but were practically independent of the parameter itself and of the subjects' clotting factor composition, despite substantial variability in the subject group. Hypothermia and blood dilution acted additively on the thrombin generation parameters.

CONCLUSIONS: We developed a general computational strategy that can be used to simulate the effects of changing temperature on the kinetics of biochemical systems and applied this strategy to analyze the effects of hypothermia on thrombin generation. We found that thrombin generation can be noticeably impaired in subjects with different blood plasma composition even in moderate hypothermia. Our work provides mechanistic support to the notion that thrombin generation impairment may be a key factor in coagulopathy induced by hypothermia and complicated by blood plasma dilution.

一項關於芳香療法用於治療術後噁心的隨機化研究

Aromatherapy as Treatment for Postoperative Nausea: A Randomized Trial

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背景：術後噁心(PON)是麻醉和手術的一項常見併發症。針對高危患者使用止吐藥物能減少但無法可靠阻止 PON 的發生。本試驗探索芳香療法是否可作爲門診手術後病人出現 PON 的一種治療手段。主要假設是與吸入安慰劑的比較，吸入薑味香精油或者薑、綠薄荷、胡椒薄荷和豆蔻的混合物或異丙醇能顯著減少 PON 的發生。次要假設是芳香療法的有效性依賴於特定藥物的使用。

方法：在某一門診手術中心對在麻醉後監護室報告發生噁心的患者實施一項芳香療法的隨機試驗。入組標準是成人，有知情同意能力，且無凝血障礙或香薰劑過敏史。在手術前，收集人口統計學和風險因素資料。給口述性量表（0-3）中，有噁心水準 1～3 級的患者一塊含有隨機選擇芳香劑的紗布，並深吸氣 3 次； 5 分鐘後再次測量噁心水準（0-3）。預防性和噁心後應用止吐藥需醫生醫囑或病人要求。

結果：共有 1151 例患者進入篩查；303 例報告噁心(26.3%)者納入，其中對符合協議標準的 301 例進行分析(26.2%)。與生理鹽水組相比較，噁心水準具有顯著變化，混合物組(P < 0.001)、和生薑組(P = 0.002)的噁心水準有明顯變化，而酒精組則無差異(P < 0.76)。與生理鹽水組相比，混合物組和生薑組在止吐劑應用次數方面也顯著減少 (分別爲 P = 0.002 和 P < 0.001)。

結論：芳香療法可能是一種有效的 PON 治療方法。在此研究結果基礎上,未來應進一步評估芳香療法。芳香療法作爲針對 PON 的一種廉價無創治療方法，並可由患者根據需要進行管理和自控，是非常有前景的。

（孫曉瓊　譯　陳傑　校）

BACKGROUND: Postoperative nausea (PON) is a common complication of anesthesia and surgery. Antiemetic medication for higher-risk patients may reduce but does not reliably prevent PON. We examined aromatherapy as a treatment for patients experiencing PON after ambulatory surgery. Our primary hypothesis was that in

comparison with inhaling a placebo, PON will be reduced significantly by aromatherapy with (1) essential oil of ginger, (2) a blend of essential oils of ginger, spearmint, peppermint, and cardamom, or (3) isopropyl alcohol. Our secondary hypothesis was that the effectiveness of aromatherapy will depend upon the agent used.

METHODS: A randomized trial of aromatherapy with patients who reported nausea in the postanesthesia care unit was conducted at one ambulatory surgical center. Eligibility criteria were adult, able to give consent, and no history of coagulation problems or allergy to the aromatherapy agents. Before surgery, demographic and risk factors were collected. Patients with a nausea level of 1 to 3 on a verbal descriptive scale (0–3) received a gauze pad saturated with a randomly chosen aromatherapy agent and were told to inhale deeply 3 times; nausea (0–3) was then measured again in 5 minutes. Prophylactic and postnausea antiemetics were given as ordered by physicians or as requested by the patient.

RESULTS: A total of 1151 subjects were screened for inclusion; 303 subjects reporting nausea were enrolled (26.3%), and 301 meeting protocol were analyzed (26.2%). The change in nausea level was significant for the blend ($P < 0.001$) and ginger ($P = 0.002$) versus saline but not for alcohol ($P < 0.76$). The number of antiemetic medications requested after aromatherapy was also significantly reduced with ginger or blend aromatherapy versus saline ($P = 0.002$ and $P < 0.001$, respectively).

CONCLUSION: The hypothesis that aromatherapy would be effective as a treatment for PON was supported. On the basis of our results, future research further evaluating aromatherapy is warranted. Aromatherapy is promising as an inexpensive, noninvasive treatment for PON that can be administered and controlled by patients as needed.

七氟醚麻醉和異丙酚麻醉下禁食大鼠的葡萄糖利用

Glucose Use in Fasted Rats Under Sevoflurane Anesthesia and Propofol Anesthesia

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背景: 之前報導了七氟醚麻醉與異丙酚麻醉對餵養大鼠葡萄糖利用的影響有顯著差別，但未能解釋造成這種差異的機制。

方法: 本次研究中試驗動物爲禁食大鼠。在七氟醚麻醉下行手術準備後,大鼠分爲以下三組:清醒組、七氟醚麻醉組、異丙酚麻醉組。對所有大鼠進行靜脈葡萄糖耐量測試（IVGTT），靜脈注射 0.5g/kg 的葡萄糖。在進行 IVGTT 之前，部分大鼠進行格列本脲或氯甲苯噻嗪預處理。在注入葡萄糖之前，通過測量大鼠的葡萄糖和胰島素水準計算了胰島素敏感性校對指數（QUICKI）；在進行 IVGTT 時測量了所有大鼠的葡萄糖、胰島素、腫瘤壞死因數-α（TNF-α）以及高分子量脂聯素水準。

結果：在注入葡萄糖之前，與清醒組相比,七氟醚麻醉組表現出相似程度的葡萄糖、胰島素水準，但 QUICKI 顯著升高；與清醒組相比,異丙酚麻醉組表現出相似程度的葡萄糖水平、顯著升高的胰島素水準和顯著降低的 QUICKI。注入葡萄糖之後，與清醒組相比,七氟醚麻醉組表現出顯著升高的葡萄糖水準和相似程度的胰島素水準；而與清醒組相比，異丙酚麻醉組表現出相似程度的葡萄糖水準和顯著升高的胰島素水準。在注入葡萄糖之前，七氟醚麻醉組和異丙酚麻醉組的 TNF-α 水準與清醒組水準相近似。注入葡萄糖之後，在所有清醒組及七氟醚麻醉組中均檢測不到 TNF-α，而在所有異丙酚麻醉組中均檢測到了 TNF-α；異丙酚麻醉組的 TNF-α 水準顯著高於清醒組。在整個試驗期間，七氟醚麻醉組和異丙酚麻醉組中的高分子量脂聯素水準與清醒組中的相近似。七氟醚麻醉下的大鼠，格列本脲顯著降低了葡萄糖水平，並顯著升高了胰島素水準；然而氯甲苯噻嗪對葡萄糖及胰島素水準並不造成顯著影響。異丙酚麻醉下的大鼠，格列本脲顯著降低了葡萄糖水平，並顯著升高了胰島素水準；氯甲苯噻嗪顯著的降低了葡萄糖水平而沒有改變胰島素水準。

結論：七氟醚麻醉抑制了葡萄糖誘導的胰島素分泌而不影響基礎胰島分泌，而異丙酚麻醉增強了胰島素分泌並增強了胰島素抵抗狀態，而七氟醚麻醉沒有削弱胰島素敏感性；在異丙酚麻醉下，TNF-α 可能與胰島素抵抗狀態有關。

（王苑　譯　陳傑　校）

BACKGROUND: We previously reported the marked differences in the effects of sevoflurane anesthesia and propofol anesthesia on glucose use in fed rats; however, we could not elucidate mechanisms underlying the differences.

METHODS: We used fasted rats in this study. After surgical preparation under sevoflurane anesthesia, rats were divided into 3 groups: awake rats, rats under sevoflurane anesthesia, and rats under propofol anesthesia. All rats underwent the IV glucose tolerance test (IVGTT); 0.5 g/kg glucose was administered IV to rats. Just before IVGTT, some rats were pretreated with glibenclamide or diazoxide. We measured glucose, insulin, tumor necrosis factor-α (TNF-α), and high molecular weight adiponectin levels during IVGTT and calculated the quantitative insulin sensitivity check index (QUICKI) using glucose and insulin levels before glucose administration in each rat.

RESULTS: Before glucose administration, rats under sevoflurane anesthesia showed similar glucose and insulin levels with significantly higher QUICKI compared with awake rats, while rats under propofol anesthesia showed similar glucose levels and significantly higher insulin levels with significantly lower QUICKI compared with awake rats. After glucose administration, rats under sevoflurane anesthesia showed significantly higher glucose levels and similar insulin levels compared with awake rats, while rats under propofol anesthesia showed similar glucose levels and significantly higher insulin levels compared with awake rats. Before glucose administration, TNF-α levels in rats under sevoflurane anesthesia and rats under propofol anesthesia were similar to those in awake rats. After glucose administration, TNF-α was undetectable in all awake rats and all rats under sevoflurane anesthesia, whereas TNF-α was detectable in all rats under propofol anesthesia; TNF-α levels in rats under propofol anesthesia were significantly higher than those in awake rats. High molecular weight adiponectin levels in rats under sevoflurane anesthesia and rats under propofol anesthesia were similar to those in awake rats throughout the experimental period. In rats under sevoflurane anesthesia, glibenclamide significantly decreased glucose levels and significantly increased insulin levels; however, diazoxide produced no significant effects on glucose and insulin levels. In rats under propofol anesthesia, glibenclamide significantly decreased glucose levels and significantly increased insulin levels, while diazoxide significantly decreased glucose levels without changing insulin levels.

CONCLUSIONS: Sevoflurane anesthesia attenuates glucose-induced insulin secretion without affecting basic insulin secretion, while propofol anesthesia enhances insulin secretion. Propofol anesthesia exaggerates insulin-resistive conditions, whereas sevoflurane anesthesia dose not impair insulin sensitivity; there may be a possible association of TNF-α with insulin-resistive conditions under propofol anesthesia.

簡報：在手術室進行肺部聽診：一項比較電子和傳統聽診器的前瞻性隨即雙盲對照實驗

Brief Report: Pulmonary Auscultation in the Operating Room: A Prospective Randomized Blinded Trial Comparing Electronic and Conventional Stethoscopes

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背景: 此研究比較了兩種聽診器(Holtex Ideal® 和 Littmann Cardiology III®)和一種電子聽診器(Littmann 3200®)在手術室中的主觀肺部聽診品質。
方法: 在 100 例行機械通氣的病人中進行一項前瞻性雙盲隨機對照研究。每例經過體檢後，聽診者使用一個數字量表（0-10）來評估聽診品質。使用對單因素分析中顯著因素校正後，伴有隨機截距（操作者效應）的多層混合線性回歸的方法來比較不同聽診器的聽診品質。P<0.05 時，差異有統計學意義。
結果: 共進行 100 例肺部聽診的比較性評估。電子聽診器的聽診品質值在 8.2 ± 1.6，Littmann Cardiology III 的值爲 7.4 ± 1.8，而 Holtex Ideal 爲 4.6 ± 1.8。與 Holtex Ideal 相比，另外 2 組聽診器的聽診品質更高 (P < 0.0001)。與 Littmann Cardiology III 相比， Littmann 3200 電子聽診器的聽診品質更高(β = 0.9 [95% 可信區間, 0.5–1.3])。
結論: 與傳統聽診器相比，在手術室中使用電子聽診器可提供更好的肺部聽診品質，但提升效果有限。這是否能轉化爲臨床上的受益還需要進一步研究。
（瞿亦楓 譯 陳傑 校）

BACKGROUND: We compared the subjective quality of pulmonary auscultation between 2 acoustic stethoscopes (Holtex Ideal® and Littmann Cardiology III®) and an electronic stethoscope (Littmann 3200®) in the operating room.
METHODS: A prospective double-blind randomized study with an evaluation during mechanical ventilation was performed in 100 patients. After each examination, the listeners using a numeric scale (0–10) rated the quality of auscultation. Auscultation quality was compared in patients among stethoscopes with a multilevel mixed-effects linear regression with random intercept (operator effect), adjusted on significant factors in univariate analysis. A significant difference was defined as P < 0.05.
RESULTS: One hundred comparative evaluations of pulmonary auscultation were performed. The quality of auscultation was rated 8.2 ± 1.6 for the electronic stethoscope, 7.4 ± 1.8 for the Littmann Cardiology III, and 4.6 ± 1.8 for the Holtex Ideal. Compared with Holtex Ideal, auscultation quality was significantly higher with other stethoscopes (P < 0.0001). Compared with Littmann Cardiology III, auscultation

quality was significantly higher with Littmann 3200 electronic stethoscope (β = 0.9 [95% confidence interval, 0.5–1.3]).

CONCLUSIONS: An electronic stethoscope can provide a better quality of pulmonary auscultation than acoustic stethoscopes in the operating room, yet with a magnitude of improvement marginally higher than that provided with a high performance acoustic stethoscope. Whether this can translate into a clinically relevant benefit requires further studies.

二種硬膜外嗎啡劑量在剖宮產後鎮痛中的應用：一項隨機非劣性實驗

The Efficacy of 2 Doses of Epidural Morphine for Postcesarean Delivery Analgesia: A Randomized Noninferiority Trial

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背景：硬膜外單次給予嗎啡能有效減輕剖宮產後疼痛，但也伴隨一些副作用。此研究嘗試：作爲剖宮產後多模式鎮痛的一部分，給予傳統硬膜外嗎啡的一半劑量，是否能產生非劣性鎮痛效果和更少的副作用。

方法：將 90 名接受硬膜外麻醉下剖腹產手術的產婦納入此項隨機，雙盲，非劣性研究。產婦被隨機分成兩組，一組接受 3mg 硬膜外嗎啡，另一組接受 1.5mg 硬膜外嗎啡。另外實驗物件定時靜脈給予酮咯酸和對乙醯氨基酚。當疼痛難以忍受時給予補救性鎮痛（口服羥考酮）。主要預後指標是兩組第一個 24 小時內的嗎啡消耗量（採用靜脈注射嗎啡等效劑量的中位數來測量）。3.33mg 是預先設定非劣性劑量的邊界值。次要預後指標包括：嗎啡在第二個 24 小時中的消耗量，數值標定量表疼痛評分，第一次補救鎮痛的時間間隔，總體疼痛緩解，產婦滿意度，恢復品質和副作用。

結果：資料分析來自於 87 名受試者。通過測定 1.5mg 和 3mg 硬膜外給予嗎啡後 24 小時內嗎啡消耗量的中位數差異是 0mg（包含 1 的 95%可信區間，2.5mg）證實了非劣性的判斷，這遠小於預期的非劣性劑量 3.33mg。在第二個 24 小時或者整個 48 小時內，嗎啡的消耗量在兩組之間無顯著差異。第二個 24 小時的疼痛評分、總體疼痛緩解，產婦滿意度在兩組之間無顯著差異。1.5mg 硬膜外嗎啡組在

術後 6-12 小時有更低的中重度瘙癢發生率（相對危險度，0.44,95%可信區間，0.2-0,9;相對危險度，0.41,95%可信區間，0.2-0.8）,並在術後 6 小時有更少的噁心嘔吐發生率（相對危險度，0,22,95%可信區間,0.05-0.9）。在術後 12 周的平均疼痛評分中，兩組無顯著差異。

結論：作爲剖宮產術後多模式鎮痛的一部分，較 3mg 硬膜外的嗎啡劑量，1.5mg 硬膜外嗎啡在鎮痛方面具有非劣性，而且副作用更少。

（鄭華容　譯　陳傑　校）

BACKGROUND: A single dose of epidural morphine is effective in reducing pain after cesarean delivery but is associated with adverse effects. In this study, we sought to establish whether half the traditional dose of epidural morphine, when administered as part of a multimodal analgesia regimen after cesarean delivery, was associated with noninferior analgesia and fewer adverse effects.

METHODS: Ninety term parturients undergoing cesarean delivery under epidural anesthesia were enrolled in this randomized, double-blinded, noninferiority study. Patients were randomly allocated to receive either 3 mg epidural morphine or, half this dose, 1.5 mg epidural morphine. In addition, subjects received regular systemic ketorolac and acetaminophen. Rescue analgesia (oral oxycodone) was administered for breakthrough pain. The primary outcome was the difference between groups in total opioid consumption (measured in median IV morphine equivalents) within the first 24 hours. A prespecified noninferiority margin of 3.33 mg was used. Secondary outcomes included total opioid consumption from 24 to 48 hours, numerical rating scale pain scores, time to first request for analgesics, overall pain relief, maternal satisfaction, quality of recovery, and adverse effects.

RESULTS: Data were analyzed for 87 participants. Noninferiority was demonstrated as the difference in median 24-hour opioid consumption between the 1.5 mg epidural morphine (EM) and 3 mg EM groups was 0 mg (1-sided 95% confidence interval [CI], 2.5 mg), which was less than the prespecified noninferiority margin of 3.33 mg. No significant differences were found between groups in the median 24- to 48-hour opioid consumption or the median total opioid consumption within 48 hours. Pain scores, overall pain relief, and satisfaction at 24 and 48 hours were not significantly different between groups. The 1.5 mg EM group had a lower incidence of moderate and severe pruritus at 6 and 12 hours (relative risk [RR] 0.44, 95% CI, 0.2–0.9 and RR 0.41, 95% CI, 0.2–0.8, respectively) and had less nausea and vomiting at 6 hours (RR 0.22, 95% CI, 0.05–0.9). There was no difference in average pain scores at 12 weeks between the 2 groups.

CONCLUSION: When used as part of a multimodal analgesia regimen, 1.5 mg epidural morphine provided noninferior postcesarean analgesia and caused fewer adverse effects compared with 3 mg epidural morphine.

簡報：測定大腦灌注壓的臨床實際和實驗研究比較：文獻綜述和從業者調查

Brief Report: A Comparison of Clinical and Research Practices in Measuring Cerebral Perfusion Pressure: A Literature Review and Practitioner Survey

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背景：本研究目的爲確定如何通過平均動脈壓來測算大腦灌注壓在基礎文獻和多中心臨床實踐兩者間是否有差異。

方法：通過回顧基礎文獻以及向多個神經重症監護學會的成員醫院發送電子郵件進行調查研究。

結果：共有 32 篇文章報導了大腦灌注壓資料，其中共有 16 篇參考了平均動脈壓：10 篇是心臟來源，6 篇是中腦來源。臨床調查回饋率爲 14.3%。回饋來自 34 家美國神經學會認可的下屬神經重症監護學會成員醫院中的 31 所（91%），大多數參考心臟來源動脈壓（74%），中腦占 16%。10%的回饋顯示矛盾結果。

結論：在如何通過平均動脈壓測算大腦灌注壓的問題上，不管是文獻報導還是臨床實踐都確實存在差異。

（陸秉瑋　譯　陳傑　校）

BACKGROUND: Our objective was to determine whether there is variability in the foundational literature and across centers in how mean arterial blood pressure is measured to calculate cerebral perfusion pressure.

METHODS: We reviewed foundational literature and sent an e-mail survey to members of the Neurocritical Care Society.

RESULTS: Of 32 articles reporting cerebral perfusion pressure data, the reference point for mean arterial blood pressure was identified in 16: 10 heart and 6 midbrain. The overall survey response rate was 14.3%. Responses from 31 of 34 (91%) United Council for Neurologic Subspecialties fellowship-accredited Neurointensive Care Units indicated the reference point was most often the heart (74%), followed by the midbrain (16%). Conflicting answers were received from 10%.

CONCLUSIONS: There is substantive heterogeneity in both research reports and clinical practice in how mean arterial blood pressure is measured to determine cerebral perfusion pressure.

靜脈給予右旋糖減少術後止吐治療需要和術後住在監護室的時間

Intravenous Dextrose Administration Reduces Postoperative Antiemetic Rescue Treatment Requirements and Postanesthesia Care Unit Length of Stay

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背景：術後噁心嘔吐（PONV）仍是最常見的術後併發症，可引起病人滿意度降低，延長術後住院時間，及引起意想不到的住院。有些有限的資料表明右旋糖可減少噁心嘔吐。在這項試驗中，我們試圖確定是否可通過術後右旋糖單劑量靜脈內注射來減少 PONV 的發生率。

方法：爲了檢驗術後給予右旋糖對 PONV 發生率的影響，我們進行了一項雙盲、隨機、安慰劑對照試驗。我們招募了 62 名非糖尿病、ASA I 或 II 級、不抽煙、計畫行婦科腹腔鏡和宮腔鏡手術的患者。病人被隨機分爲兩組：治療組在術後立即給予加入 5%右旋糖的乳酸林格液，對照（安慰劑）組在術後立即給予乳酸林格液。所有病人接受了標準化全身麻醉及麻醉蘇醒前半小時給予一個劑量的止吐藥。在麻醉後監護室（PACU）每間隔半小時記錄一次 PONV 分數、止吐劑解救的用藥情況、鎮靜劑的用量和離開 PACU 的時間。

結果:這兩組在年齡、體重、焦慮度評分、以前的 PONV 史、禁食狀況、術前葡萄糖、麻醉持續時間、術中麻醉性鎮痛藥的使用以及基於體重的總輸液量這些方面是相似的。對這一段時間反復測定的值 Bonferroni 糾正之後的術後噁心分數在右旋糖組和對照組沒有明顯差別（P > 0.05）。然而，給予乳酸林格液中加入 5%右旋糖的病人比對照組的病人用更少的解救止吐藥(比率平均差異 0.56,95%可信區間 0.39-0.82；P=0.02），並且在 PACU 逗留的時間短些（比率平均差異 0.80；95%可信區間，0.66-0.97；P=0.03）。

結論：在這個試驗中，麻醉後靜脈給予右旋糖減少止吐藥的解救需要量和在 PACU 逗留的時間，所以確定其引起 PONV 管理的改善，這是值得進一步研究的。由於它的易行性、低風險及對病人護理和滿意度方面的好處，可以考慮用這項治療措施。

（王曉莉 譯　馬皓琳 李士通 校）

BACKGROUND: Postoperative nausea and vomiting (PONV) remains the most common postoperative complication, and causes decreased patient satisfaction, prolonged postoperative hospital stays, and unanticipated admission. There are limited data that indicate that dextrose may reduce nausea and vomiting. In this trial, we attempted to determine whether the rate of PONV can be decreased by postoperative administration of IV dextrose bolus.
METHODS: To test the effect of postoperative dextrose administration on PONV rates, we conducted a double-blind, randomized, placebo-controlled trial. We enrolled 62 nondiabetic, ASA class I or II nonsmoking outpatients scheduled for gynecologic laparoscopic and hysteroscopic procedures. Patients were randomized into 2 groups: the treatment group received dextrose 5% in Ringer lactate solution, and the control (placebo) group received Ringer lactate solution given immediately after surgery. All patients underwent a standardized general anesthesia and received 1 dose of antiemetic a half hour before emergence from anesthesia. PONV scores, antiemetic rescue medications, narcotic consumption, and discharge time were recorded in the postanesthesia care unit (PACU) in half-hour intervals.
RESULTS: The 2 groups were similar with regard to age, weight, anxiety scores, prior PONV, non per os status, presurgical glucose, anesthetic duration, intraoperative narcotic use, and total weight-based fluid volume received. Postoperative nausea scores were not significantly different in the dextrose group compared with the control group ($P > 0.05$) after Bonferroni correction for repeated measurements over time. However, patients who received dextrose 5% in Ringer lactate solution consumed less rescue antiemetic medications (ratio mean difference, 0.56; 95% confidence interval, 0.39–0.82; $P = 0.02$), and had a shorter length of stay in the PACU (ratio mean difference, 0.80; 95% confidence interval, 0.66–0.97; $P = 0.03$) compared with patients in the control group.
CONCLUSION: In this trial, postanesthesia IV dextrose administration resulted in improved PONV management as defined by reductions in antiemetic rescue medication requirements and PACU length of stay that are worthy of further study. In light of its ease, low risk, and benefit to patient care and satisfaction, this therapeutic modality could be considered.

比較甘草和糖水漱口預防術後咽喉痛及拔管後咳嗽作用的隨機雙盲研究

A Randomized, Double-Blind Comparison of Licorice Versus Sugar-Water Gargle for Prevention of Postoperative Sore Throat and Postextubation Coughing

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背景：一個小的研究表明，在麻醉誘導前用甘草漱口可以減少術後咽喉痛的發生率。雙腔導管大，故而特別容易引起咽喉痛。因此，我們檢驗假設外科手術前，用甘草溶液漱口可以預防用雙腔導管插管後的咽喉痛及拔管後嗆咳反應。
方法：我們徵集了 236 名需要進行雙腔氣管導管插管的擇期胸外科手術患者。患者被隨機分配到以下兩組，在麻醉誘導前 5 分鐘，分別用（1）Liquiritiae Fluidum 浸出液（甘草 0.5g）；或者（2）單一糖漿（糖 5g）漱口 1 分鐘；分別溶解在 30ml 水中。分別在到達復蘇室後 30min、90min 和 4h 時以及術後第一天上午，由不知道分組情況的研究者使用 11 點利克特量表評估咽喉痛和拔管後咳嗽。
結果：甘草漱口組的術後咽喉痛的發生率較糖水組明顯降低：30min 時，分別爲 19%和 36%；1.5h 時，分別爲 10%和 35%；4h 時，分別爲 21%和 45%。相應的估計治療效果（相對危險度）爲 0.54（95%可信區間，0.30-0.99，甘草對比糖水；P=0.005），0.31（0.14-0.68）（P<0.001），及 0.48（0.28-0.83）（P<0.001）。
結論：甘草漱口使咽喉痛的發生率減少一半。誘導前用甘草漱口看來是預防一個常見且令人煩惱的併發症的簡便方法。
（董靜 譯　馬皓琳 李士通 校 ）

BACKGROUND: One small study suggests that gargling with licorice before induction of anesthesia reduces the risk of postoperative sore throat. Double-lumen tubes are large and thus especially likely to provoke sore throats. We therefore tested the hypothesis that preoperative gargling with licorice solution prevents postoperative sore throat and postextubation coughing in patients intubated with double-lumen tubes.
METHODS: We enrolled 236 patients having elective thoracic surgery who required intubation with a double-lumen endotracheal tube. Patients were randomly assigned to gargle 5 minutes before induction of anesthesia for 1 minute with: (1) Extractum Liquiritiae Fluidum (licorice 0.5 g); or (2) Sirupus Simplex (sugar 5 g); each diluted in 30 mL water. Sore throat and postextubation coughing were evaluated 30 minutes, 90 minutes, and 4 hours after arrival in the postanesthesia care unit, and the first postoperative morning using an 11-point Likert scale by an investigator blinded to treatment.

RESULTS: The incidence of postoperative sore throat was significantly reduced in patients who gargled with licorice rather than sugar-water: 19% and 36% at 30 minutes, 10% and 35% at 1.5 hours, and 21% and 45% at 4 hours, respectively. The corresponding estimated treatment effects (relative risks) were 0.54 (95% CI, 0.30–0.99, licorice versus sugar-water; P = 0.005), 0.31 (0.14–0.68) (P < 0.001), and 0.48 (0.28–0.83) (P < 0.001).
CONCLUSION: Licorice gargling halved the incidence of sore throat. Preinduction gargling with licorice appears to be a simple way to prevent a common and bothersome complication.

布比卡因和羅呱卡因對原代鼠細胞培養物中肌管和永生細胞系的肌毒性作用

The Myotoxic Effect of Bupivacaine and Ropivacaine on Myotubes in Primary Mouse Cell Culture and an Immortalized Cell Line

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背景：兩個局部麻醉藥（LAs）布比卡因和羅呱卡因對不同組織有急性的細胞毒性作用。在這方面，局麻藥導致的肌毒性已經有很多研究；然而確切的機制仍未完全闡明。出於可行性考慮，大多數離體研究應用永生細胞系。因此，建立一個原代細胞系可能得到更精確的結果。在這項研究中，我們檢驗了永生化對布比卡因和羅呱卡因導致的肌毒性離體研究的影響。
方法：我們建立了相同組織和物種的永生細胞系（N = 6）和原代細胞系（N = 8），並誘導分化爲肌管。細胞分別被暴露在濃度遞增的布比卡因和羅呱卡因中 1 或 2 小時。處理後 24 和 48 小時，應用流式細胞儀測量死亡和存活細胞的比例。通過單因素方差分析和 post hoc Dunnett T3 檢驗法來檢驗顯著性。用 T 檢驗來比較資料集配對的中位數。
結果：遞增濃度的兩個局麻藥均導致了兩種細胞系中細胞存活的減少（例如，在兩種細胞系中 5000 ppm 布比卡因培養 1 或 2 小時及 24 小時恢復後 P < 0.001）。在相同局麻藥濃度下，永生細胞系培養的存活率明顯較高（例如，2500 ppm 羅呱卡因培養 1 小時及 24 小時恢復後 P < 0.001）。除此之外，相同濃度的布比卡因較羅呱卡因導致了明顯減少的存活細胞（例如，2500 ppm 羅呱卡因培養 1 小時及恢復 24 小時後 P = 0.032）。2 小時的培養較 1 小時的培養導致細胞死亡率

明顯增高（例如，C2C12 細胞暴露於 2500 ppm 布比卡因及恢復 24 小時後 P = 0.004）。

結論：原代骨骼肌細胞較永生細胞對局麻藥更易損。在體研究中布比卡因較羅呱卡因有較高的肌毒潛在性，可以在離體培養中再現。暴露時間對細胞存活有影響。（張怡 譯　馬皓琳 李士通 校）

BACKGROUND: The 2 local anesthetics (LAs) bupivacaine and ropivacaine have acute cytotoxic effects on different tissues. In this respect, LA-induced myotoxicity has been subject to various studies; however, the exact mechanisms are still not fully understood. Most in vitro studies use immortalized cell lines because of feasibility. Thus, establishing a primary cell line might result in more accurate results. In this study, we examined the effects of immortalization on bupivacaine- and ropivacaine-induced myotoxicity in vitro.

METHODS: An immortalized (N = 6) and a primary cell line (N = 8) of the same tissue and species were established, and differentiation in myotubes was induced. Cells were exposed to increasing concentrations of bupivacaine and ropivacaine for 1 or 2 hours, respectively. Twenty-four and 48 hours after treatment, the fractions of dead and vital cells were measured using flow cytometry. Significance was tested through 1-way analysis of variance with post hoc Dunnett T3 test. Medians of dataset pairs were compared by T test.

RESULTS: In both cell lines, increasing concentrations of both LAs resulted in decreased cell survival (e.g., $P < 0.001$ for 5000 ppm bupivacaine, 1 or 2 hours of incubation, and 24 hours recovery in both cell lines). For the same LA concentrations, survival was significantly higher in the immortalized cell culture (e.g., $P < 0.001$ for 2500 ppm ropivacaine, 1 hour of incubation, and 24 hours recovery). In addition, equal concentrations of bupivacaine resulted in significantly fewer vital cells compared with ropivacaine (e.g., $P = 0.032$ for 2500 ppm ropivacaine, 1 hour of incubation, and 24 hours recovery). Two hours of incubation resulted in a significantly higher rate of dead cells compared with 1 hour of incubation (e.g., $P = 0.004$ for C2C12 cells, 2500 ppm bupivacaine, and 24 hours recovery).

CONCLUSIONS: Primary skeletal muscle cells are more vulnerable to LAs than immortalized cells. The higher myotoxic potential of bupivacaine compared with ropivacaine in vivo can be reproduced in vitro. Incubation time has an influence on cell survival.

血管內皮多糖包被：肺水腫和急性肺損傷中的新概念

The Endothelial Glycocalyx: Emerging Concepts in Pulmonary Edema and Acute Lung Injury

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血管內皮多糖包被是一種位於血管內皮管腔表面的大分子動態層，涉及到體液的平衡和調節。它在血管通透性和水腫形成中的作用正在浮現，但還不十分明瞭。在這篇特別的文章中，我們著重闡述了內皮功能障礙中關於多糖包被的關鍵概念，並對多糖包被作爲肺水腫和急性肺損傷進展重要過程中的一個調節物質提供了新的見解。
（邢怡安 譯　馬皓琳 李士通 校）
The endothelial glycocalyx is a dynamic layer of macromolecules at the luminal surface of vascular endothelium that is involved in fluid homeostasis and regulation. Its role in vascular permeability and edema formation is emerging but is still not well understood. In this special article, we highlight key concepts of endothelial dysfunction with regards to the glycocalyx and provide new insights into the glycocalyx as a mediator of processes central to the development of pulmonary edema and lung injury.

局麻藥注射後的周圍神經損傷

Peripheral Nerve Injury After Local Anesthetic Injection

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背景：周圍神經阻滯的常見併發症之一是周圍神經損傷，可由穿刺針或所用的藥物毒性導致。本研究旨在確定不同常用局麻藥束內注射所致損傷的程度。
方法：16 只 Lewis 大鼠分別接受鹽水（對照組）或三種局麻藥（布比卡因、利多卡因或羅呱卡因）之一的坐骨神經束內注射（n = 4）。兩周後取坐骨神經作組織形態學及電鏡分析。

結果：接受束內局麻藥注射的動物比對照組損傷更嚴重，尤其表現在大直徑神經纖維計數顯著減少（所有局麻藥組 P < 0.01），神經嚴重損傷區域和非損傷區域剩餘纖維面積之比顯著減少（所有局麻藥組 P < 0.01）。損傷程度存在分層，距注射部位最近的損傷最重，距損傷部位最遠的無損傷。布比卡因對大直徑纖維的損傷比另外兩種局麻藥更嚴重。所有試驗組均發現穿刺針造成的神經束橫斷損傷。電鏡證實了神經損傷。

結論：常規濃度的常用局麻藥對周圍神經存在一定毒性，可損傷周圍神經。任何合併的運動和/或感覺後遺症可能由於不同神經束的分佈造成。

（陳彬彬 譯， 馬皓琳、李士通 審校）

BACKGROUND: A well-known complication of peripheral nerve block is peripheral nerve injury, whether from the needle or toxicity of the medication used. In this study, we sought to determine the extent of damage that results from intrafascicular injection of various commonly used local anesthetics (LAs).

METHODS: Sixteen Lewis rats received an intrafascicular injection of saline (control) or 1 of 3 LAs (bupivacaine, lidocaine, or ropivacaine) into the sciatic nerve (n = 4). At a 2-week end point, the sciatic nerves were harvested for histomorphometric and electron microscopic analysis.

RESULTS: Animals that received intrafascicular LA injections showed increased severity of injury as compared with control. In particular, there was a significant loss of large-diameter fibers as indicated by decreased counts (P < 0.01 for all LAs) and area (P < 0.01 for all LAs) of remaining fibers in severely injured versus noninjured areas of the nerve. There was a layering of severity of injury with most severely injured areas closest to and noninjured areas furthest from the injection site. Bupivacaine caused more damage to large fibers than the other 2 LAs. In all groups, fascicular transection injury from the needle was observed. Electron microscopy confirmed nerve injury.

CONCLUSIONS: Frequently used LAs at traditional concentrations are toxic to and can injure the peripheral nerve. Any combination of motor and/or sensory sequelae may result due to the varying fascicular topography of a nerve.

經前列腺切除器刺激預測膀胱腫瘤切除術中阻滯內收肌收縮反應的需要

Trans-Resectoscope Stimulation Predicts the Need to Block Adductor Response During Bladder Tumor Resection

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背景：對行經尿道切除膀胱下側腫瘤的患者施行閉孔神經阻滯以防止股內收肌收縮。但除了腫瘤位置以外，我們沒有標準來判斷是否所有病人都有這個阻滯的必要。而且，術前很難預測閉孔神經阻滯的有效性。爲解決這些難題，我們已經設計了一個經前列腺切除器刺激技術，通過前列腺切除器將一些單個顫搐電刺激傳遞到膀胱內壁來引發股內收肌的收縮。

方法：對泌尿科醫生要求閉孔神經阻滯的 45 個病人的 51 次手術中實施經前列腺切除器刺激。如果在經前列腺切除器刺激下，沒有觀察到股內收肌收縮（即，陰性結果），在不考慮其他因素，實施腫瘤切除手術。如果觀察到陽性結果，則實施閉孔神經阻斷或給予病人一個肌松藥，直到結果轉陰。記錄對最初的經前列腺切除器刺激的陽性或陰性結果及隨後腫瘤切除術中的股內收肌收縮。

結果：51 例病例中有 29 例（57%）最初的經前列腺切除器刺激結果爲陰性。在這些病例中，允許開始腫瘤切除，且未發生股內收肌收縮（發生率[95%置信區間]：0%[0%-5.7%]）。在最初的經前列腺切除器刺激結果爲陽性的病例中（22/51 或 43%），我們實施了閉孔神經阻滯或給予一個肌松藥後，再次刺激以在術前驗證內收肌沒有反應，在腫瘤切除手術中沒有觀察到病人股內收肌收縮現象。

結論：經前列腺切除器刺激不但有益於預測膀胱腫瘤切除手術中阻滯股內收肌收縮的必要性，還能避免不必要的閉孔神經阻滯。

(趙曉 譯 馬皓琳 李世通 校)

BACKGROUND: Obturator nerve block is performed on patients who undergo transurethral resection of inferolateral bladder tumors to prevent thigh adductor muscle contraction. However, other than the tumor site, we have no criteria to judge whether this block is necessary in all patients. Moreover, it is difficult to predict the efficacy of obturator nerve block before resection. To solve these problems, we have devised a trans-resectoscope stimulation technique that involves delivering several single-twitch electrical stimuli to the inside wall of the bladder via a resectoscope to elicit contraction of the thigh adductor muscle.

METHODS: Trans-resectoscope stimulation was performed in 51 cases on 45 patients for which urologists had requested obturator nerve block. If no thigh adductor muscle contraction was observed with trans-resectoscope stimulation (i.e., negative result), tumor resection was performed without further investigation. If the result was positive, we performed obturator nerve block or administered a muscle relaxant until the result turned negative. Positive or negative responses to the initial trans-resectoscope stimulation and thigh adductor muscle contraction during subsequent resection were recorded.

RESULTS: The initial trans-resectoscope stimulation result was negative in 29 of the 51 cases (57%). In these cases, tumor resection was allowed to proceed, and no thigh adductor muscle contraction occurred (rate of incidence [95% confidence interval]: 0% [0%–5.7%]). In cases with a positive initial trans-resectoscope stimulation result (22/51 or 43%), we performed an obturator nerve block or administered a muscle relaxant after which we once again stimulated to verify the lack of adductor response before proceeding with the resection, and no thigh adductor muscle contraction was observed during resection.
CONCLUSIONS: Trans-resectoscope stimulation is beneficial not only to predict the need to block the contraction of the thigh adductor during tumor resection but also to avoid unnecessary obturator nerve block.

庫存血小板預熱後功能不下降

Stored platelet functionality is not decreased after warming with a fluid warmer

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背景：手術中靜脈補液和血液製品常規加熱後輸注以維持正常體溫。雖然缺乏文獻證據，依然有一些當前指南反對對血小板預熱。我們的初步研究目的是探究血小板預熱對其功能的影響。
方法：我們從輸血服務中心取得了 10 個單位 3 天前採集的富血漿血小板。在預熱前從每個單位的血小板中取 5mL 樣品。其餘的血小板用預熱裝置預熱 2 分鐘。在預熱裝置的流出端採集預熱後的血小板樣品。分別對對照組和預熱組測定血小板凝集試驗。試驗用二磷酸腺苷、膠原蛋白和花生四烯酸作爲激動劑。此外還做了血栓彈力圖試驗。
結果：對照組的平均溫度是 22.4℃ ± 0.5℃，預熱組的平均溫度是 37.8℃ ± 2.3℃。所有血小板凝集試驗和血栓彈力圖中各項指標的 P 值沒有顯著性差異(所有 P 值≥ 0.13)。只有 1 項參數的平均值下降 5%(用 5μM 二磷酸腺苷爲激動劑的血小板凝集，95%置信區間爲-115% to 105%)。用花生四烯酸爲激動劑的血小板凝集試驗觀察值變化最大，上升了 116%(95%置信區間-91% to 323%)。
結論：儘管樣本量小，該試驗不支持禁止預熱血小板的主張。加熱後血小板啓動的研究仍需深入。
(陳實玉譯 薛張綱校)

BACKGROUND: Warming of IV-administered fluids and blood products is routinely performed in the operating room to help maintain normothermia. Current guidelines recommend against the warming of platelets (PLTs), although there is no evidence for this prohibition in the literature. Our goal in this pilot study was to determine whether the warming of stored PLTs had any effect on their function.
METHODS: Ten units of 3-day-old, PLT-rich plasma-derived whole blood PLTs were acquired from the transfusion service. A 5-mL aliquot was taken from each unit before warming (control samples). The remainder of the unit was then passed into a blood-warming device and held there for 2 minutes. Postwarming (warmed) PLT samples were then collected from the effluent end of the warming device. PLT aggregometry assays with adenosine diphosphate, collagen, and arachidonic acid as agonists were performed on the control and warmed samples. Thromboelastography tests were also performed on the control and warmed samples from 6 of the 10 PLT units.
RESULTS: The mean temperature of the control and warmed samples was 22.4°C ± 0.5°C and 37.8°C ± 2.3°C, respectively. There was no significant difference (all $P \geq 0.13$) in any of the PLT aggregometry assays or in the maximum amplitude of the thromboelastography test between the control and the warmed samples. The observed mean of only 1 parameter decreased (PLT aggregometry with 5 μM adenosine diphosphate) by 5% (95% confidence interval, -115% to 105%). The maximum change observed was PLT aggregometry with arachidonic acid as agonist, which increased by 116% (95% confidence interval, -91% to 323%).
CONCLUSION: Although small in size, the results of this study do not support the prohibition against mechanical PLT warming. Studies of PLT activation after warming are also warranted.

圍術期戒煙的有效性研究：一項隨機臨床試驗

The effectiveness of a perioperative smoking cessation program: a randomized clinical trial.

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背景：吸煙會增加手術患者的併發症，特別是圍手術期的呼吸問題以及傷口癒合不良。在本研究中，研究者試圖證明一個專爲忙碌的住院前門診設計的戒煙干預是否能成功的降低吸煙率以及術中和術後併發症的發生率。

方法：該項隨機對照實驗是在一所位於加拿大安大略倫敦市的大學附屬醫院進行的。在住院前門診就診的患者至少提前三周被隨機分爲對照組（84 人）以及干預組（84 人）。對照組的患者不接受任何特別的戒煙干預。干預組的患者將受到（1）入院前護士的簡短的輔導，（2）戒煙小手冊，（3）被介紹給加拿大癌症協會的吸煙者熱線，以及（4）免費提供 6 周透皮尼古丁替代治療。所有手術當日的結果評估者以及照顧者對於患者分組皆盲。主要的評估結果是通過呼出一氧化碳呼氣測試確定的戒煙率。次要評估標準包括圍手術期併發症以及術後 30 日的吸煙情況。

結果：在 2010 年 10 月至 2012 年 4 月間，有 168 名患者被納入該研究。干預組中有 12 名患者戒煙（14.3%）,對照組有 3 名患者戒（3.6%），（相對危險 4.0，98%可信區間[CI]，1.2-13.7;P=0.03）。干預組和對照組之間術中和術後併發症的整體聯合率無顯著差別（分別爲 13.1%和 16.7%,相對危險 0.79；95%CI, 0.38-1.63;P=0.67）。術後連續 30 日內，干預組有 22 名患者戒煙（28.6%），對照組有 8 名患者戒煙（11%）（相對危險 2.6, 95% CI 1.2-5.5; P=0.008）。

結論：對於反對在住院前門診廣泛使用戒煙干預的意見之一其過於勞動密集。該研究結果顯示，旨在減少醫生或護理的額外時間，戒煙干預可以減少手術當日吸煙率以及促進術後 30 日的戒煙。

（陳婉南譯 薛張綱校）

BACKGROUND：Cigarette smoking by surgical patients is associated with increased complications, particularly perioperative respiratory problems and poor wound healing. In this study, we sought to determine whether a pragmatic perioperative smoking cessation intervention designed for a busy preadmission clinic would be successful in reducing smoking rates and intraoperative and immediate postoperative complications.

METHODS: This randomized controlled trial was conducted at a university-affiliated hospital in London, Ontario, Canada. Patients seen in the preadmission clinic at least 3 weeks preoperatively were randomized to either the control group (84 patients) or the intervention group (84 patients). The control group received no specific smoking cessation intervention. The intervention group received (1) brief counseling by the preadmission nurse, (2) brochures on smoking cessation, (3) referral to the Canadian Cancer Society's Smokers' Helpline, and (4) a free 6-week supply of transdermal nicotine replacement therapy. All outcome assessors and caregivers on the operative day were blinded to group assignment. The primary outcome was the rate of smoking cessation as confirmed by exhaled carbon monoxide

breath test. Secondary outcomes included perioperative complications and smoking status at 30 days postoperatively.

RESULTS: Between October 2010 and April 2012, 168 patients were recruited into the study. Smoking cessation occurred in 12 patients (14.3%) in the intervention group as compared with 3 patients (3.6%) in the control group (relative risk 4.0; 95% confidence interval [CI], 1.2-13.7; P = 0.03). The overall rate of combined intraoperative and immediate postoperative complications was not significantly different between intervention and control groups (13.1% and 16.7%, respectively; relative risk 0.79; 95% CI, 0.38-1.63; P = 0.67). At follow-up 30 days postoperatively, smoking cessation was reported in 22 patients (28.6%) in the intervention group compared with 8 patients (11%) in controls (relative risk 2.6; 95% CI, 1.2-5.5; P = 0.008).

CONCLUSIONS：One of the objections to widespread use of smoking cessation interventions in the preadmission clinic is that it is too labor-intensive. The results of this study show that a smoking cessation intervention, designed to minimize additional use of physician or nursing time, results in decreased smoking rates on the day of surgery and promotes abstinence 30 days postoperatively.

簡報：食管探測時的洩漏可以導致正壓通氣時跨肺間壓在通氣裝置的錯誤設置

Brief report: leaking esophageal probe may lead to false ventilator settings when guiding positive end-expiratory pressure by transpulmonary pressure.

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食管的壓力（Pes）代表了胸腔的壓力。在正壓通氣時通過食管壓力的測定來調整跨肺間壓(PL)，可以提高急性呼吸窘迫綜合征時的供氧和預後。在病態肥胖的病人中，我們觀察到了跨肺間壓的逐漸增高，但是氣道壓力(Paw)、腹內壓、病人的位置都沒有變化。在以後的測試裡，我們決定在食道壓探測洩露時逐漸人工增高跨肺間壓，這將導致低估食管內壓和高估跨肺間壓，這個結果源於一個等式PAW-PES=PL。

（蔣鑫梅譯 薛張綱校）

Esophageal pressure (Pes) is a surrogate for intrapleural pressure. Measuring Pes during mechanical ventilation allows for positive end-expiratory pressure adjustments by transpulmonary pressure (PL), which has been shown to improve oxygenation and outcome in acute respiratory distress syndrome patients. In morbidly obese patients,

we saw progressively increasing PL measurements, although airway pressure (Paw), intra-abdominal pressure, and patient position did not change. On further examination, we determined that the gradual increases of PL were artifacts caused by a leak in the pressure probes, which resulted in underestimation of Pes and overestimation of PL as derived from the equation Paw - Pes = PL.

智利人群中椎管內麻醉和晚期卵巢癌預後的關係

The relationship between neuraxial anesthesia and advanced ovarian cancer-related outcomes in the chilean population.

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背景：各項已發表的證據表明腫瘤外科手術中局部麻醉的使用可以減少腫瘤復發並改善總的生存期。我們研究全身麻醉複合硬膜外麻醉在晚期卵巢癌切除過程中及之後，對腫瘤復發和總生存期的影響。
方法： 本研究通過前瞻性臨床註冊，共獲取 80 例晚期卵巢癌患者（國際婦產科聯合會分期 III C 期和 IV 期），手術時間 2000 年 1 月至 2011 年 3 月。在控制選擇偏倚後，使用一般健康狀態評分（PS 評分系統，配對和負加權）來比較施行硬膜外麻醉和未施行硬膜外麻醉兩組患者的復發時間和總生存期。
結果：CNAP 相較 IAP 總的準確度(偏倚)爲收縮壓-6.3 ± 18.9, 舒張壓 7.4 ± 10.5, 平均壓 4.0 ±11.3mm Hg(mean ± SD)。嚴重低血壓時偏倚增加爲收縮壓 11.8 ± 14.5, 舒張壓 13.8 ± 12.4, 平均壓 12.9 ± 12.4 mm Hg.CNAP 對應的 IAP 兩組血壓差值小於 15mmHg 定義爲一致性(95%可信限),總的一致性爲舒張壓 58.5% (57.9-58.6), 舒張壓 75.8% (75.5-76.0), 平均壓 82.2% (81.9-82.4);快速起搏時一致性爲收縮壓 56.4% (54.2-58.9; P = 0.71), 舒張壓 53.2%* (51.1-56.0), 平均壓 57.4%* (56.3-59.1; *P < 0.001) . CNAP 和 IAP 平均值的相關性較好,在快速起搏各時相差別不顯著. EA 組和非 EA 組的中位復發時間分別爲 1.6 年和 0.9 年（P=0.02）。使用 PS 評分系統進行配對後 EA 組和非 EA 組的中位復發時間分別爲 1.6 年和 1.4 年（P=0.3）。相類似的，PS 評分系統加權後也未證明硬膜外麻醉對腫瘤復發時間的改善。在 PS 配對樣本中使用 COX 比例風險模型分析，EA 暴露的估算損害比（0.72，95%CI：0.40-1.33），實質上不能改變化療的估算損害比（0.73，95%CI：0.40-1.31）。使用 PS 加權可得到類似結果。EA 組和非 EA 組的生存期分別爲 3.3 年和 1.9 年（P=0.01）。PS 配對後 EA 組和非 EA 組的中位生存期分別爲 3.3

年和 2.7 年（P=0.37）。相類似的，PS 加權後也未能證明硬膜外麻醉對生存期的改善。PS 配對樣本 EA 暴露的估算損害比（0.74，95%CI：0.36-1.49），實質上不能改變化療的估算損害比，使用 PS 加權可得到類似結果。

結論：通過 PS 配對和加權，我們沒有發現晚期卵巢癌（IFGO IIIc 期和 IV 期）瘤體減滅術中及術後使用硬膜外麻在總體生存期和復發時間上的改善。

（李春譯 薛張綱校）

BACKGROUND: Mixed evidence has been published relating the use of regional anesthesia during oncologic surgery to a decrease in time to cancer recurrence and improvement in overall survival. We investigated whether the use of epidural anesthesia, in addition to general analgesia during and/or after surgical removal of advanced ovarian cancer, has an impact on time to recurrence and overall survival.

METHODS: Patients were identified from a prospective clinical registry. Eighty patients with advanced ovarian cancer (International Federation of Gynecologists and Obstetricians, stage IIIC and IV) undergoing surgery between January 2000 and March 2011 were studied. Propensity scoring (PS) methods (matching and inverse weighting) were used to compare the time to recurrence and overall survival of patients who did and did not receive epidural anesthesia and/or analgesia (EA), after controlling for selection bias.

RESULTS: The median time to recurrence was 1.6 and 0.9 years for the EA and no EA groups, respectively (P = 0.02). After PS matching, the median time to recurrence was 1.6 and 1.4 years for the EA and no EA groups, respectively (P = 0.30). Similarly, PS weighting did not demonstrate an improvement in time to recurrence with the use of EA. Using a Cox proportional hazards model in the PS-matched sample, the estimated hazard ratio for EA exposure (0.72; 95% confidence interval [CI], 0.40-1.33) did not change substantially after adjusting for chemotherapy (0.73; 95% CI, 0.40-1.31). Similar results were obtained using PS weighting. The median survival time was 3.3 and 1.9 years for the EA and no EA groups, respectively (P = 0.01). After PS matching, the median survival time was 3.3 and 2.7 years for the EA and no EA groups, respectively (P = 0.37). Similarly, PS weighting did not demonstrate an improved survival with the use of EA. The estimated hazard ratio (0.74; 95% CI, 0.36-1.49) in the PS matched sample did not change substantially after adjusting for chemotherapy, with similar results when PS weighting was applied.

CONCLUSIONS: After PS matching and weighting, we found no benefit in overall survival or time to recurrence in patients with advanced stages (International Federation of Gynecologists and Obstetricians IIIC and IV) of ovarian cancer after the use of EA during and after tumor debulking surgery.

焦點綜述：重度子癇前期患者的脊髓麻醉

Focused review: spinal anesthesia in severe preeclampsia.

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當未留置硬膜外導管或存在神經脊髓麻醉禁忌時，腰麻被廣泛認爲是重度子癇前期患者行剖宮產手術的合理麻醉選擇。與健康產婦相比，重度子癇前期患者較少發生腰麻後的嚴重低血壓。在重度子癇前期的患者，腰麻比硬膜外麻醉有更高的低血壓發生率，然而這種低血壓通常是容易治療和短暫的，且臨床結局的差別無顯著相關性。在這篇綜述中，我們描述了對重度子癇前期患者進行腰麻的優點和局限性，以及指導術中血流動力學管理的證據。
（凌曉敏譯 薛張綱校）

Spinal anesthesia is widely regarded as a reasonable anesthetic option for cesarean delivery in severe preeclampsia, provided there is no indwelling epidural catheter or contraindication to neuraxial anesthesia. Compared with healthy parturients, those with severe preeclampsia experience less frequent, less severe spinal-induced hypotension. In severe preeclampsia, spinal anesthesia may cause a higher incidence of hypotension than epidural anesthesia; however, this hypotension is typically easily treated and short lived and has not been linked to clinically significant differences in outcomes. In this review, we describe the advantages and limitations of spinal anesthesia in the setting of severe preeclampsia and the evidence guiding intraoperative hemodynamic management.

局部布比卡因的禁忌-減輕術後微球體帶來的有毛髮的皮膚切口處的劇烈疼痛感。

Inhibition by local bupivacaine-releasing microspheres of acute postoperative pain from hairy skin incision.

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背景：術後劇烈的疼痛會引起身體虛弱且恢復緩慢。臨床目標在於實現手術過去幾天後，可以通過局部麻醉劑來減少疼痛感，這一目標是靠新配方來實現，此處彙報一下以動物來試驗的情況。

方法：我們給老鼠皮下注射新型的乳酸聚合物微球，在手術之前的兩個小時爲老鼠背部提供 96 小時以上穩定的藥物釋放。我們先在老鼠身上割一道 1.2 釐米長的皮膚切口，然後將皮膚鈍性分離出底層筋膜，再縫合 2 針，最後是 14 天的測試。手術前兩個小時，局部注射包含 5，10，20 和 40 毫克布比卡因的微球體；無布比卡因的微球體是媒介控制，布比卡因 HCL 溶液（0.5%）是陽性對照。通過撥弄尼龍單絲（觸覺測量套件），施加 4 到 15 克的力，分別對觸摸疼、痛覺過敏和針刺疼進行測試，然後由局部肌肉收縮的頻率決定機械靈敏度。

結論：布比卡因微球體（40 毫克藥品）注射入未受損的皮膚能降低對 15 克觸覺測量套件的反應，作用時間爲 6 小時，對於針刺能起 36 小時作用。鹽酸布比卡因分別減少的時間爲 3 小時和 2 小時。皮膚切口和單獨解剖導致 14 天的機械性痛覺異常和痛覺過敏。包含 20 或 40 毫克布比卡因的微球體，最多 3 天會壓制手術後的超敏性，減少整體疼痛異常（回應與時間關係曲線區域），在手術後 1 到 5 天內 7 以 51%+/-20%(中間值+/-SE)和 78%+/-12%的比例，用分別的劑量，以 55%+/-13%和 64%+/-11%的比例減少整體疼痛儘管有 40mg 布比卡因注射到切口兩側，微球體中 5mg 和 10mg 布比卡因以及 0.5%布比卡因溶液對減少術後過敏沒有效果。

結論：在完整皮膚，緩釋布比卡因製劑對術後疼痛的抑制作用持久。這些發現論證了完善術後鎮痛可以預防因急性疼痛轉化爲慢性疼痛。

（劉毅譯 薛張綱校）

BACKGROUND: Acute postoperative pain causes physiological deficits and slows recovery. Reduction of such pain by local anesthetics that are delivered for several days postoperatively is a desirable clinical objective, which is approached by a new formulation and applied in animal studies reported here.

METHODS: We subcutaneously injected a new formulation of poly-lactic-co-glycolic acid polymer microspheres, which provides steady drug release for 96+ hours into rats at the dorsal region 2 hours before surgery. A single 1.2-cm-long skin incision was followed by blunt dissection of skin away from the underlying fascia, and closed by 2 sutures, followed by 14 days of testing. Microspheres containing 5, 10, 20, and 40 mg bupivacaine were injected locally 2 hours before surgery; bupivacaine-free microspheres were the vehicle control, and bupivacaine HCl solution (0.5%), the positive control. Mechanical sensitivity was determined by the frequency of local muscle contractions to repeated pokes with nylon monofilaments (von Frey hairs) exerting 4 and 15 g forces, testing, respectively, allodynia and hyperalgesia, and by pinprick.

RESULTS: Injection of bupivacaine microspheres (40 mg drug) into intact skin reduced responses to 15 g von Frey hairs for 6 hours and to pinprick for 36 hours. Respective reductions from bupivacaine HCl lasted for 3 and 2 hours. Skin incision and dissection alone caused mechanical allodynia and hyperalgesia for 14 days. Microspheres containing 20 or 40 mg bupivacaine suppressed postoperative hypersensitivity for up to 3 days, reduced integrated allodynia (area under curve of response versus time) over postoperative days 1 to 5 by 51% ± 20% (mean ± SE) and 78% ± 12%, and reduced integrated hyperalgesia by 55% ± 13% and 64% ± 11%, for the respective doses. Five and ten milligrams bupivacaine in microspheres and the 0.5% bupivacaine solution were ineffective in reducing postoperative hypersensitivity, as were 40 mg bupivacaine microspheres injected contralateral to the incision.
CONCLUSIONS: Significant suppression of postoperative pain by the slow-release bupivacaine preparation outlasts its anesthetic action on intactskin. These findings demonstrate preventive analgesia and indicate the importance of acute processes in the development of chronic postoperativepain.