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通過對突觸前和突觸後具有高度特異性作用的毒素評估發現四個成串電刺激和強直刺激後衰減並非僅是突觸前效應

Train-of-Four and Tetanic Fade Are Not Always a Prejunctional Phenomenon as Evaluated by Toxins Having Highly Specific Pre- and Postjunctional Actions

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Anesth Analg May 2013 116:994-1000

背景：肌肉的神經刺激後衰減被普遍認爲是由於神經末梢突觸前乙醯膽鹼受體（AchRs）被阻滯而產生的突觸前現象，而顫搐張力的降低被認爲是由於肌肉 AchRs 被阻滯而產生的突觸後效應。本研究通過使用具有特異性突觸前或觸突後效應的配體，考察衰減並非僅是一個突觸前現象的假設。

方法：給予大鼠肌注（2.5U）或靜注（12U）肉毒桿菌毒素（Botx），或僅靜脈注射 α-金環蛇毒素(α-BTX)後測定神經肌肉功能。同樣測定單獨靜脈注射二氫 β 刺桐定(DhβE，2mg/kg)以及同時給予 α-BTX 後的急性神經肌肉效應。BTX 減少 Ach 的囊泡釋放，α-BTX 僅結合突觸前煙鹼樣 AchRs，而 DHβE 僅僅特異性結合突觸前 α3β2 AchRs。由於 Botx 即使在靜脈注射後 2h 內也缺乏急性效應，因此評估其肌注(0.6U)24h 後的神經肌肉效應，並與肌注 α-BTX（25 μg/kg）或肌注生理鹽水 24h 後的效應進行比較。對坐骨神經-脛骨肌施加四個成串電刺激和強直刺激進行神經肌肉效應的在體試驗。

結果：靜脈注射和肌注 Botx 後 2h 並未發現神經肌肉效應。靜脈注射 α-Botx 後幾分鐘內產生了顫搐抑制，並在 75%的基線顫搐張力時有顯著的衰減(P = 0.002)；這些效應持續至 2h 的觀察期結束。單純靜脈注射 DHβE 對單次顫搐刺激（P = 0.899）或四個成串電刺激（P = 0.394）並不產生顯著的變化，但顯著增強了靜脈注射 α-BTX 後的衰減（P = 0.001，75%基線顫搐張力時）。肌注 Botx 或 α-Botx24 小時後,產生了單次顫搐和強直收縮張力的降低（P<0.0001），但 Botx 並未造成衰減，而 α-Botx 在注射後 24h 引起了顯著衰減（P<0.0001）。24h 後脛骨肌重量以及 AChRα1 亞單位的蛋白表達（western blots）在 Botx, α-BTX 和生理鹽水注射組之間無差別，但在去神經支配的肌肉中則增加（陽性對照）。

結論：Botx 誘導的 ACh 釋放減少並不導致衰減但導致了絕對張力的下降。 α-BTX 導致的功能性突觸後 AchRs 的減少引起了衰減。DHβE 對於 α3β2 AChRs 突觸前衰減效應僅在聯合應用 α-BTX 引起安全邊際下降時體現出來。因此，重複刺激下的衰減並非總是突觸前現象，也可能反映了神經傳遞安全閾值的下降，後者是單純由於突觸後 AChRs 阻滯或由於突觸前後 AChRs 的雙重阻滯。單純阻滯突觸前 α3β2 AChRs 並非衰減的充分必要條件。

（瞿亦楓　譯　陳傑　校）

BACKGROUND: Nerve-stimulated fade in muscle is generally accepted as a prejunctional phenomenon mediated by block of prejunctional acetylcholine receptors (AChRs) at the nerve terminal, whereas decrease of twitch tension is considered a postjunctional effect due to block of muscle AChRs. Using ligands with specific pre- or postjunctional effects only, we tested the hypothesis that fade is not necessarily a prejunctional phenomenon.

METHODS: Neuromuscular function in rats was evaluated after IM (2.5 U) or IV (12.0 U) injection of botulinum toxin (Botx), or IV (250 μg/kg) α-bungarotoxin (α-BTX) alone. The acute neuromuscular effects of IV 2 mg/kg dihydro-β-erythroidine (DHβE), alone and in combination with α-BTX, were also tested. Botx decreases vesicular release of ACh, and α-BTX binds to postjunctional nicotinic AChRs only, whereas DHβE binds specifically to prejunctional α3β2 AChRs only. In view of the lack of acute effects of Botx even at 2 hours after IV injection, its neuromuscular effects were also evaluated at 24 hours after IM injection (0.6 U) and compared with IM injection of α-BTX (25 μg/kg) or saline also given 24 hours earlier. The sciatic nerve-tibialis muscle preparation, during train-of-four and tetanic stimulation, was used to test neuromuscular effects in vivo.

RESULTS: IV and IM Botx had no observable neuromuscular effects at 2 hours. IV α-BTX caused twitch depression within a few minutes, and significant fade (P = 0.002) at 75% of baseline twitch tension; these effects persisted until the end of the observation period of 2 hours. IV DHβE alone caused no significant change in single twitch (P = 0.899) or train-of-four ratio (P = 0.394), but significantly enhanced the fade of IV α-BTX (P = 0.001 at 75% of baseline twitch tension). IM Botx or α-BTX, at 24 hours after their injection, resulted in a significant decrease of single twitch and tetanic tensions (P < 0.0001), but Botx did not cause fade, whereas α-BTX caused significant (P < 0.0001) fade at 24 hours. The tibialis muscle weights and protein expression of α1 subunit of AChR (Western blots) did not differ between Botx, α-BTX and saline-injected groups at 24 hours but increased in denervated muscle (positive control).

CONCLUSIONS: Botx-induced decreased ACh release in and of itself does not cause fade but does cause decrease of absolute tensions. Decrease of available (functional) postjunctional AChRs by α-BTX did induce fade. The prejunctional fade effects of DHβE on α3β2 AChRs become manifest only when the margin of safety was decreased by concomitant administration of α-BTX. Thus, fade during repetitive stimulation is not always a prejunctional phenomenon and may also reflect the decreased margin of safety of neurotransmission, which can be due to a pure postjunctional AChRs block or to a combination of both pre- and postjunctional AChRs block. Block of prejunctional α3β2 AChRs alone is not necessary and sufficient to cause fade.

使用簡潔、無菌、一次性使用的壓力感測器放置中心靜脈導管的一項多中心評估

A Multicenter Evaluation of a Compact, Sterile, Single-Use Pressure Transducer for Central Venous Catheter Placement

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Anesth Analg May 2013 116:1018-1023

背景：大口徑中心靜脈導管（CVC）在嘗試放置期間發生不慎置入動脈的幾率爲0.1%至1.0%，並可能導致出血，假性動脈瘤，中風甚至死亡。超聲引導或觀察血液的顏色及搏動並不是避免這些嚴重併發症的可靠方法。在導絲置入前測量針或塑膠導管的壓力已被證明是比較可靠的方法，但傳統的壓力測量方法較爲不便。最近一種簡潔數字顯示、無菌、一次性使用的壓力感測器可供選擇。這項研究評估了這種新裝置的性能(Compass® Vascular Access)。
方法：在這個前瞻性觀察研究中，在 4 個教學醫療中心共放置了 298 個中心靜脈導管。在插入導絲前後使用 Compass® 感測器測量壓力。其他操作細節由臨床醫生決定。收集中心靜脈導管放置記錄和任何併發症的資料。
結果：298例中心靜脈導管置管中的279例由實習生放置。286例採用超聲引導方法。有7例操作在重症監護病房進行，其餘的在手術室。10例爲鎖骨下靜脈置管，其餘爲頸內靜脈置管。298例中心靜脈導管中的274例在右側。置入導絲前後的靜脈壓測定分別爲7.2±4.3mmHg（標準差）和6.5±4.3mmHg（標準差）（P = 0.03）。操作醫生的滿意度評分爲8.0±2.1（標準差，視覺類比評分1-10，10爲最滿意）。有5例不慎刺破動脈（1.7%）。這5例都採用了超聲引導。所有的誤入動脈事件在導絲插入前都經 Compass® 感測器測量動脈血壓來識別。未曾發生導絲或 CVC 導管置入動脈的情況。
結論：在 4 個教學醫療中心共完成 298 例應用 Compass® 壓力感測器放置中心靜脈導管。儘管採用超聲引導，仍有 5 例不慎刺破動脈，所有這些事件均可通過使用 Compass® 進行壓力測量而識別。學員易於使用該設備，使用者都表現出很高的滿意度。
（諸琳婕　譯　陳傑　校）

BACKGROUND: Inadvertent arterial placement of a large-bore catheter during attempted placement of a central venous catheter (CVC) occurs at a rate of 0.1% to 1.0% and may result in hemorrhage, pseudoaneurysm, stroke, or death. Ultrasound guidance or observation of color and pulsatility of blood are not reliable methods for avoiding this serious complication. Measurement of pressure in the needle or short plastic catheter before insertion of the guidewire has been shown to be highly reliable; however, traditional pressure measurement methodology is cumbersome. Recently a compact, sterile, single-use pressure transducer with an integrated digital display has become available. In this study, we evaluated the performance of this new device (Compass® Vascular Access).
METHODS: In this prospective, observational study at 4 academic medical centers 298 CVCs were placed. Pressure was measured using the Compass transducer before and after guidewire insertion. Other details of the procedure were at the discretion of the clinician. Data describing the CVC placement and any complications were collected.
RESULTS: Trainees placed 279 of 298 CVCs. Ultrasound guidance was used for 286 of 298 CVCs. Seven of the CVC placements occurred in the intensive care unit, with the balance occurring in the operating room. Ten of the CVCs were placed in a subclavian vein, with the balance being internal jugular vein. Two hundred seventy-four of 298 CVCs were placed on the

right side. Venous pressure measured before and after guidewire insertion was 7.2 ± 4.3 (SD) and 6.5 ± 4.3 (SD) mm Hg respectively (P = 0.03). The satisfaction score recorded by the physician performing the procedure was 8.0 ± 2.1 (SD; visual analog scale 1–10, 10 being most satisfying). There were 5 inadvertent arterial punctures (1.7%). Ultrasound guidance was used in all 5 cases of arterial puncture. All of the arterial punctures were recognized before guidewire insertion by measurement of arterial pressure with the Compass transducer. No guidewires or CVC catheters were placed in arteries.

CONCLUSION: The Compass pressure transducer for CVC placement performed as intended in 298 cases from 4 academic medical centers. There were 5 inadvertent arterial punctures despite the use of ultrasound guidance, all of which were correctly identified by pressure measurement using the Compass. The device was easily used by trainees, and users expressed a positive level of satisfaction.

根據瞳孔測量法來評估分娩疼痛，一項前瞻性觀察研究

Assessment of Pain During Labor with Pupillometry: A Prospective Observational Study

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Anesth Analg May 2013 116:1057-1062

背景：疼痛的強烈程度通常是由病人通過數位評價量表(NRS)自我評定的，但這種量表不能被用於無法交流的病人。在麻醉的病人中，實驗性傷害刺激增加瞳孔直徑(PD)、瞳孔對光反射振幅(PLRA)和光刺激前後的瞳孔直徑差異。分娩疼痛是一種急性而強烈的非試驗性刺激，能被硬膜外鎮痛有效緩解。在這項前瞻性觀察研究中，描述分娩疼痛和用硬膜外鎮痛來緩解疼痛對 PD 和 PLRA 的影響，評估後兩者與疼痛強度的關係，並考察單次 PD 或 PLRA 測量值對疼痛評估的能力。

方法：第一產程，在 4 個時間點（硬膜外鎮痛前後，宮縮前後）測定 26 名分娩產婦的疼痛程度（11 分值 NRS）、PD 和 PLRA。比較 4 個時間點的瞳孔大小，使用 r^2 值來評估疼痛絕對值與 PD 或 PLRA 之間，宮縮前後疼痛值與 PD 或 PLRA 變化之間的相關性。第二產程，此方法應用於 104 名分娩產婦。使用 r^2 值來評估疼痛與 PD 或 PLRA 之間的相關性。同時評估 PD 或 PLRA 辨別疼痛（NRS 大於 4 分）的能力。

結果：第一產程，宮縮期間觀察到疼痛評分、PD、PLRA 均有顯著增加，而硬膜外鎮痛後消失。代表宮縮前後疼痛與 PD 或 PLRA 變化之間相關性的 r^2 值(分別爲 0.25 [95% 可信區間, 0.07–0.46] ； 0.34 [0.14–0.56])，比代表疼痛與 PD 或 PLRA 絕對值之間相關性的 r^2 值（分別爲 0.14 [0.04–0.28])； 0.22 [0.10–0.37])要更高，表明變化比數值本身有更強的相關性。第二產程中, PD 和 PLRA 與疼痛相關的 r^2 值分別爲 0.23 [0.10–0.38]和 0.26 [0.11–0.40] ，兩者的受試者操作特徵曲線下面積分別是 0.82 [0.73–0.91] 和 0.80 [0.71–0.89]。

結論：宮縮前後引起的 PD 和 PLRA 變化可作爲評估無法交流患者疼痛的一種方法。

（詹愷誕　譯　陳傑　校）

BACKGROUND: Pain intensity is usually self-rated by patients with a numeric rating scale (NRS) but this scale cannot be used for noncommunicating patients. In anesthetized patients,

experimental noxious stimulus increases pupillary diameter (PD) and pupillary light reflex amplitude (PLRA), the difference between PD before and after light stimulation. Labor pain is an intense acute nonexperimental stimulus, effectively relieved by epidural analgesia. In this prospective observational study, we therefore describe the effects of labor pain and pain relief with epidural analgesia on PD and PLRA, determine their association with pain intensity and determine the ability of a single measurement of PD or PLRA to assess pain.

METHODS: In the first stage, pain (11-point NRS), PD, and PLRA were measured in 4 conditions in 26 laboring women: before and after epidural analgesia and in the presence and absence of a uterine contraction. Pupillometry values among the 4 conditions were compared, and the strength of the association between absolute values of pain and PD or PLRA and between pain and changes in PD or PLRA brought about by uterine contraction was assessed with r^2. In the second stage, 1 measurement was performed in 104 laboring women. The strength of the association between pain and PD or PLRA was assessed with r^2. The ability of PD or PLRA to discriminate pain (NRS > 4) was also assessed.

RESULTS: In the first stage, a statistically significant increase in pain, PD, and PLRA was observed during a contraction, and this change was abolished after epidural analgesia. The r^2 for the association between pain and changes in PD (r^2 = 0.25 [95% confidence interval, 0.07–0.46] or PLRA (r^2 = 0.34 [0.14–0.56]) brought about by a uterine contraction was higher than the r^2 for the association between pain and absolute values of PD (r^2 = 0.14 [0.04–0.28]) or PLRA (r^2 = 0.22 [0.10–0.37]) suggesting a stronger association for changes than for absolute values. In the second stage, r^2 was 0.23 [0.10–0.38] for PD and 0.26 [0.11–0.40] for PLRA and the area under the receiver operating characteristics curve was 0.82 [0.73–0.91] and 0.80 [0.71–0.89], respectively.

CONCLUSIONS: Changes in PD and PLRA brought about by a uterine contraction may be used as a tool to assess analgesia in noncommunicating patients.

綜述：非甾體抗炎藥在孕期和哺乳初期的使用

Review Article: Nonsteroidal Anti-Inflammatory Drugs During Pregnancy and the Initiation of Lactation

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Anesth Analg May 2013 116:1063-1075

摘要：非甾體抗炎藥（NSAIDs）和阿司匹林在大部分國家都是作爲非處方藥物銷售並且廣泛用於孕婦和處於哺乳期的婦女。它們是一類被廣泛用於經陰道分娩及剖腹產術後的非阿片類鎮痛藥物。此外，非甾體抗炎藥還常用於先兆早產的安胎治療，而低劑量的阿司匹林對先兆子癇和抗磷脂綜合征患者的復發性流產有預防作用。非甾體抗炎藥和阿司匹林可能影響生育並且增加妊娠早期流產的風險。在妊娠中期非甾體抗炎藥和阿司匹林的使用被認爲是相當安全的，不過現在已被證實與胎兒隱睾相關。在妊娠晚期，由於胎兒風險的顯著增加，比如腎損傷、羊水過少、動脈導管收縮（新生兒持續性肺動脈高壓的潛在風險）、壞死性結腸炎和顱內出血，應避免使用非甾體抗炎藥和阿司匹林。大部分非甾體抗炎藥的母體給予或經腸道攝入會導致嬰兒低劑量的母乳暴露，而 COX-1 和 COX-2 抑制劑在母乳餵養時被認爲是安全的，且優於阿司匹林。

（孫莉荔　譯　陳傑　校）

Nonsteroidal anti-inflammatory drugs (NSAIDs) and aspirin, which are available as “over-the counter” medications in most countries, are widely used by both pregnant and lactating women. They are popular non-opioid analgesics for the treatment of pain after vaginal and operative delivery. In addition, NSAIDs are used for tocolysis in premature labor, and low-dose aspirin has a role in the prevention of preeclampsia and recurrent miscarriage in antiphospholipid syndrome. NSAIDs and aspirin may affect fertility and increase the risk of early pregnancy loss. In the second trimester their use is considered reasonably safe, but has been associated with fetal cryptorchism. In the third trimester, NSAIDs and aspirin are usually avoided because of significant fetal risks such as renal injury, oligohydramnios, constriction of the ductus arteriosus (with potential for persistent pulmonary hypertension in the newborn), necrotizing enterocolitis, and intracranial hemorrhage. Maternal administration or ingestion of most NSAIDs results in low infant exposure via breastmilk, such that both cyclooxygenase-1 and cyclooxygenase-2 inhibitors are generally considered safe, and preferable to aspirin, when breastfeeding.

頭皮區域阻滯在開顱術後鎮痛中的應用：一項系統性回顧和 Meta 分析

Regional Scalp Block for Postcraniotomy Analgesia: A Systematic Review and Meta-Analysis

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Anesth Analg May 2013 116:1093-1102;

背景：據報告多達三分之二的患者在顱腦手術後手術部位存在中重度疼痛，並且考慮到對神經系統評估的影響，通過全身應用阿片類藥物來治療疼痛是有所顧慮的。此外，關於神經外科可替代的鎮痛策略缺少共識和證據。頭皮區域阻滯（RSB）是一項成熟的技術，包括在定義的解剖部位做局部浸潤麻醉，作用於支配頭皮的主要感覺神經。然而，RSB 的降低術後疼痛的療效仍不清楚。這項研究試圖系統地確定和回顧關於 RSB 的隨機對照試驗（RCT）和通過一項定量薈萃分析對其有效性進行總體估計。

方法：在 MEDLINE，EMBASE 和 Cochrane 中心對照試驗註冊資料庫檢索了所有關於評估 RSB 對開顱術後疼痛效果的隨機對照試驗。標題，摘要，論文由兩個獨立的審閱者甄別預定義入選標準而確定。兩位作者獨立評估相關研究和患者報告疼痛評分所提取資料的品質，鎮痛需求和 RSB 的併發症。疼痛評分用一個通用的 0 至 10 的區間來衡量，得分越高表明疼痛越劇烈。通過一個隨機-效應、逆方差、加權模型進行匯總療效的 Meta 分析；異質性由 I^2 參數來量化。

結果：文獻檢索發現了 138 個獨立引文，來自 7 個隨機對照實驗總共 320 名符合納入標準的患者。所有的研究都使用標準的局麻藥物（利多卡因，布比卡因，或羅呱卡因）；其中有 3 個研究中的局麻藥聯合了腎上腺素。在 3 個研究中，RSB 是在術前進行的，其他 4 個研究中，RSB 是在手術切口關閉後進行。歸因於 RSB 的併發症未見報道。Meta 分析發現在術後一小時組疼痛評分有總體下降（5 項研究；平均差，-1.61；95%可信區間，-2.06 至 -1.15;$p < 0.001$; $I^2=0\%$）。術前 RSB 應用的亞組分析顯示手術結束後 2、4 和 6-8h 的疼痛評分顯著降低，而術後 RSB 應用可顯著降低術後 2、4、6-8 和 12h 的疼痛評分。雖然這

些研究有明顯的異質性，手術後第一個 24h 對阿片類藥物需求量總體減少（ 6 項研究；標準平均差，−0.79；95%的可信區間，1.55 到−−0.03；P = 0.04；I2 =86%）。
結論：已發表的關於 RSB 的隨機對照試驗雖然樣本量小，且方法學品質有限，但 Meta 分析顯示關於減輕術後疼痛的發現是一致的。這一證據支援了開顱手術的患者使用 RSB。
（鄭華容　譯　陳傑　校）

BACKGROUND: Up to two-thirds of patients report moderate to severe surgical site pain after craniotomy procedures, and there is understandable reluctance to manage these symptoms with systemic opioids that may impair neurological assessment. Furthermore, there is a lack of consensus and evidence concerning alternative analgesia strategies for cranial neurosurgery. Regional scalp block (RSB) is an established technique that involves infiltration of local anesthetic (LA) at well-defined anatomical sites targeting the major sensory innervation of the scalp. However, the efficacy of RSB in reducing postoperative pain remains unclear. In this study, we sought to systematically identify and review randomized controlled trials (RCTs) of RSB and synthesize an overall estimate of efficacy in a quantitative meta-analysis.
METHODS: Medline, EMBASE, and the Cochrane Central Register of Controlled Trials databases were searched for all RCTs evaluating the effect of RSB on postoperative pain after craniotomy. Titles, abstracts, and papers were reviewed independently by 2 authors against predefined inclusion criteria. Two authors independently assessed the quality of included studies and extracted data on patient-reported pain scores, other analgesia requirements, and complications of RSB. Pain scores were scaled to a common 0 to 10 interval with higher scores indicating more severe pain. Meta-analysis of the pooled treatment effect was performed with a random-effects inverse-variance weighted model; heterogeneity was quantified with the I^2 statistic.
RESULTS: The literature search identified 138 unique citations, from which 7 RCTs with a total recruitment of 320 patients met the inclusion criteria. All studies used standard LA drugs (lidocaine, bupivacaine, or ropivacaine); in 3 studies, LA was combined with epinephrine. In 3 studies, RSB was performed preoperatively; in the other 4 studies, it was administered postoperatively after wound closure. No complications attributable to RSB were reported. Meta-analysis found a pooled reduction in pain score at 1 hour postoperatively (N = 5 studies; mean difference, −1.61; 95% confidence interval, −2.06 to −1.15; $P < 0.001$; I^2 = 0%). Subgroup analysis of preoperative RSB showed significant reduction in pain scores at 2, 4, and 6 to 8 hours after surgery whereas postoperative RSB was associated with significant reduction in pain scores at 2, 4, 6 to 8 and 12 hours assessments. There was also an overall reduction in the opioid requirements over the first 24 hours postoperatively, although with significant heterogeneity among the studies (N = 6 studies; standardized mean difference, −0.79; 95% confidence interval, −1.55 to −0.03; P = 0.04; I^2 = 86%).
CONCLUSION: Published RCTs of RSB are small and of limited methodological quality but meta-analysis shows a consistent finding of reduced postoperative pain. This evidence supports the use of RSB for patients undergoing craniotomy.

特約評論：中世紀的伊斯蘭醫師對氣管切開術的歷史貢獻

Special Article: Contributions of Medieval Islamic Physicians to the History of Tracheostomy

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This report was previously presented, in part, at the III NWAC 2012 World Anesthesia Convention, Istanbul, Turkey, April 24–28, 2012.
Anesth Analg May 2013 116:1123-1132;

氣管切開術最早由包括 Paulus of Aegina 的希臘羅馬醫師所描述。中世紀的伊斯蘭臨床醫師延伸了希臘羅馬醫師的想法，在包括氣管切開術方面對手術領域有重要貢獻。儘管 Al-Zahrawi（936-1013 CE）聲稱他並沒有聽說或閱讀過任何關於伊斯蘭醫師演示氣管切開術，許多顯赫的伊斯蘭外科醫師在中世紀時期確實進行搶救生命的操作。在伊斯蘭鼎盛時期，穆斯林醫師對氣管切開術的操作步驟、儀器以及輔助藥物方面進行了改善。
（黃萍　譯　陳傑　校）
Tracheostomy was first described by Greco-Roman physicians, including Paulus of Aegina. Medieval Islamic clinicians extended the Greco-Roman ideas with substantial contributions to the field of surgery, including tracheostomy. Although Al-Zahrawi (936–1013 CE) stated that he had not heard or read of any Islamic physicians having performed tracheostomy, there is evidence that many prominent Islamic surgeons did practice this lifesaving procedure during medieval times. Throughout the Islamic Golden Age, Muslim physicians advanced the practice of tracheostomy with many modifications of the procedure, instrumentation, and adjuvant medicinal prescriptions.

SNAP5114--γ 氨基丁酸轉運體 3 的抑制劑，在大鼠實驗性疼痛模型中的鎮痛作用

The Antinociceptive Effect of SNAP5114, a Gamma-Aminobutyric Acid Transporter-3 Inhibitor, in Rat Experimental Pain Models

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Anesth Analg May 2013 116:1162-1169;

背景：γ 氨基丁酸（GABA）是哺乳動物中樞神經系統中主要的抑制性神經遞質。γ 氨基丁酸對調節脊髓背角痛覺有重要作用。通過特定的 γ 氨基丁酸轉運體（GATs），將 γ 氨基丁酸這種神經傳遞介質從突觸間隙快速攝取到神經元及膠質細胞中，終止此作用。四種 GATs 中，GAT-3 的表達量最大，在與痛覺傳輸密切相關的中樞神經系統區域，包括脊髓。這項研究考察了鞘內注射 GAT-3 的選擇性抑制劑—SNAP5114,在急性、炎性和神經痛性實驗模型中的鎮痛作用。

方法：對雄性 Sprague-Dawley 大鼠進行甩尾和熱板試驗、爪壓力測試及福馬林測試來評估其熱、機械以及化學痛覺。用旋轉試驗評估運動功能。在大鼠坐骨神經上誘導出慢性壓迫性損傷。接著用電子 von Frey 測試和足底測試評估機械性痛覺過敏和熱痛覺過敏。行 SNAP5114（10，50，100，或 200 微克）鞘內注射，評估鎮痛活性。爲了確認 SNAP5114 的作用是否由 γ 氨基丁酸能傳輸介導的，在 200ugSNAP5114 注射前，行 γ 氨基丁酸 A(GABAA)的受體拮抗劑荷包牡丹堿（0.3ug）或 γ 氨基丁酸 B(GABAB)的受體拮抗劑 CGP35348(30ug)鞘內注射，並進行甩尾測試，甲醛測試，以及電子 von Frey 測試。

結果：行鞘內 SNAP5114 注射的正常大鼠，在甩尾試驗中呈劑量依賴性地延長後撤延遲，在福馬林測試中呈抑制性遲發相反應。SNAP5114 沒有影響運動性能。在慢性壓迫性損傷大鼠中，SNAP5114 劑量依賴性地抑制機械痛。SNAP5114 的鎮痛作用被荷包牡丹堿或 CGP35348 部分逆轉，而相同劑量下的荷包牡丹堿或 CGP35348 單獨使用並不影響大鼠行爲反應的基礎值。

結論：這些結果表明 SNAP5114 是通過啓動脊髓內的 $GABA_A$ 受體和 $GABA_B$ r 受體發揮鎮痛作用。對於各種疼痛的治療，GAT-3 抑制劑被證明可能有效。

（王苑　譯　陳傑　校）

BACKGROUND: Gamma-aminobutyric acid (GABA) is the primary inhibitory neurotransmitter in the mammalian central nervous system. GABAergic transmission has an important role in regulating nociception at the spinal dorsal horn. It is terminated by rapid uptake of the neurotransmitter from the synaptic cleft into neurons and glial cells, via specific GABA transporters (GATs). Among the 4 GATs, GAT-3 has the greatest expression in central nervous system regions closely associated with nociceptive transmission, including the spinal cord. In this study, we examined the antinociceptive effect of intrathecal administration of a selective GAT-3 inhibitor, SNAP5114, on acute, inflammatory, and neuropathic pain in experimental models.

METHODS: Male Sprague-Dawley rats were used to assess thermal, mechanical, and chemical nociception in the tail flick and hotplate tests, the paw pressure test, and the formalin test. A rotarod test was performed to assess motor function. Chronic constriction injury to the sciatic nerve was induced in the rats. The electronic von Frey test and the plantar test were then performed to assess mechanical allodynia and thermal hyperalgesia. SNAP5114 (10, 50, 100, or 200 μg) was administered intrathecally to examine antinociceptive activity. To confirm whether the action of SNAP5114 was mediated by GABAergic transmission, the $GABA_A$ receptor antagonist bicuculline (0.3 μg) or the $GABA_B$ receptor antagonist CGP35348 (30 μg) was administered intrathecally before 200 μg of SNAP5114 in the tail flick test, the formalin test, and the electronic von Frey test.

RESULTS: Spinally applied SNAP5114 in normal rats dose-dependently prolonged withdrawal latencies in the tail flick test and suppressed the late-phase response in the formalin test. SNAP5114 did not affect motor performance. In the chronic constriction injury rats, SNAP5114 inhibited mechanical allodynia dose-dependently. The antinociceptive action of SNAP5114 was partially reversed by bicuculline or CGP35348 at doses at which the antagonist alone did not affect baseline behavioral responses.

CONCLUSIONS: These results suggest that SNAP5114 exerts antinociceptive effects by activating $GABA_A$ and $GABA_B$ receptors in the spinal cord. The GAT-3 inhibitor may prove useful in treatment of various painful conditions.

低體溫對去促食欲神經鼠在異氟醚麻醉蘇醒期的影響

The impact of hypothermia on emergence from isoflurane anesthesia in orexin neuron-ablated mice.

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Anesth Analg May 2013 116:1001-1005

背景：促食欲神經元在日常和全麻狀態可調節睡眠/覺醒週期，此觀點已經在實驗動物中得到證明；而在人類的研究中，其作用存在爭議，部分事實證明促食欲神經有多重功能，不僅可調節睡眠/覺醒週期，也可調節體溫。假設促食欲神經不是直接調節覺醒週期，而是通過調節體溫而影響麻醉蘇醒時間。爲驗證假設，本實驗同時測量體溫和運動活動。
方法：實驗物件：去除促食欲神經元小鼠（ORX-AB）和野生鼠（WT）；實驗設備：腹腔植入遙測探頭記錄體溫，使用紅外運動感測器和自發活動量。麻醉誘導和蘇醒的定義：體動消失和恢復。小鼠接受 1.5%異氟醚和純氧 30 分鐘，分三組試驗：第一組麻醉環境溫熱 32 度，確保麻醉過程體溫恒定；第二組室溫 25 度，允許體溫波動；第三組野生鼠低溫環境 23 度。觀察目的：室溫 ORX-AB 鼠在室溫條件體溫下降的比較情況。
結果：溫室組，在體溫、體動、誘導時間等實驗組和對照組無明顯差別。室溫，實驗組誘導所需時間和維持時間更長，蘇醒時間延長，而對照組無差別。低溫，野生鼠蘇醒延長，而誘導時間在體溫條件和基因型方面沒有差異。
結論：食欲素缺乏的影響，在全麻期間足以損害體溫調節機能；因此蘇醒期應保持正常體溫。
（韓敘譯 薛張綱校）

BACKGROUND: Orexin neurons regulate the sleep/wake cycle and are proposed to influence general anesthesia. In animal experiments, orexin neurons have been shown to drive emergence from general anesthesia. In human studies, however, the role of orexin neurons remains controversial, owing at least, in part, to the fact that orexin neurons are multifunctional. Orexin neurons regulate not only the sleep/wake cycle, but also body temperature. We hypothesized that orexin neurons do not directly regulate emergence from anesthesia, but instead affect emergence indirectly through thermoregulation because anesthesia-induced hypothermia can greatly influence emergence time. To test our hypothesis, we used simultaneous measurement of body temperature and locomotor activity.
METHODS: We used male orexin neuron-ablated (ORX-AB) mice and their corresponding wild-type (WT) littermates to investigate the role of orexin neurons in emergence. Body temperature was recorded using an intraperitoneally implanted telemetric probe, and locomotor activity was measured using an infrared motion sensor. Induction of anesthesia and emergence from anesthesia were defined behaviorally as loss and return, respectively, of body movement. Mice received general anesthesia with 1.5% isoflurane in 100% oxygen for 30 minutes under 3 conditions. In the first experiment, the anesthesia chamber was warmed (32°C), ensuring a constant body temperature of animals during anesthesia. In the second experiment, the anesthesia chamber was maintained at room temperature (25°C), allowing body temperature to fluctuate. In the third experiment in WT mice, the anesthesia chamber was cooled (23°C) so that their body

temperature would decrease to the comparable value to that obtained in the ORX-AB mice during room temperature condition.
RESULTS: In the warmed condition, there were no significant differences between the ORX-AB and control mice with respect to body temperature, locomotor activity, induction time, or emergence time. In the room temperature condition, however, anesthesia-induced hypothermia was greater and longer lasting in ORX-AB mice than that in WT mice. Emergence time in ORX-AB mice was significantly prolonged from the warmed condition (14.2 ± 0.8 vs 6.0 ± 1.1 minutes) whereas that in WT mice was not different (7.4 ± 0.8 vs 4.9 ± 0.2 minutes). When body temperature was decreased by cooling in WT mice, emergence time was prolonged to 12.4 ± 1.3 minutes. Induction time did not differ among temperature conditions or genotypes.
CONCLUSIONS: The effect of orexin deficiency to impair thermoregulation during general anesthesia is of sufficient magnitude that body temperature must be appropriately controlled when studying the role of orexin neurons in emergence from anesthesia.

笑氣與非心臟手術術後死亡率和發病率之間的關聯

The association between nitrous oxide and postoperative mortality and morbidity after noncardiac surgery.

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Anesth Analg May 2013 116:1026-1033

背景：笑氣（N2O）已經被廣泛地應用於臨床麻醉有 150 多年的歷史了。然而，近年來因爲擔心它的代謝副作用，N2O 的使用有所下降。但是常規使用 N2O 產生臨床嚴重的毒性的證據仍然不明確。因此，我們評估了一組成人非心臟手術全身麻醉術中使用 N2O 和 30 天死亡率以及一組主要住院病人術後併發症（包括死亡）之間的關係。
方法：我們評估了克利夫蘭診所在 2005 年和 2009 年之間的 49016 例非心臟手術的患者。37609 合格的患者中有 16961 例使用氧化亞氮（笑氣，45％）20648 例沒有使用氧化亞氮（非笑氣，55％）。近 10755 的氧化亞氮患者（占總數的 63％）傾向與 10,755 非氧化亞氮患者得分匹配。氧化亞氮和非氧化亞氮的患者相比，30 天的死亡率和一組 8 天住院發病率/死亡率結果相匹配。
結果：術中吸入氧化亞氮術後 30 天死亡率有所下降（比值比[OR]：97.5％的可信區間，0.67，0.46-0.97，P=0.02）。此外，使用笑氣的患者與非使用笑氣的（P <0.001）患者相比，主要住院發病率/死亡率大概下降 17％（OR：0.83，0.74-0.92）。在個別發病率中，術中使用 N2O 只與肺部/呼吸系統併發症顯著下降有關（OR，95％Bonferroni-adjusted CI：0.59，0.44-0.78）。
結論：術中使用 N2O 能減少 30 天的死亡率和住院死亡率/發病率。除了其具體和眾所周知的禁忌症外，這項研究結果不支持從麻醉劑中廢除 N2O 的做法。
（賀盼 譯 薛張綱校）
BACKGROUND: Nitrous oxide (N2O) has been widely used in clinical anesthesia for >150 years. However, use of N2O has decreased in recent years because of concern about the drug's

metabolic side effects. But evidence that routine use of N2O causes clinically important toxicity remains elusive. We therefore evaluated the relationship between intraoperative N2O administration and 30-day mortality as well as a set of major inpatient postoperative complications (including mortality) in adults who had general anesthesia for noncardiac surgery.
METHODS: We evaluated 49,016 patients who had noncardiac surgery at the Cleveland Clinic between 2005 and 2009. Among 37,609 qualifying patients, 16,961 were given N2O ("nitrous," 45%) and 20,648 were not ("nonnitrous," 55%). Ten thousand seven hundred fifty-five nitrous patients (63% of the total) were propensity score-matched with 10,755 nonnitrous patients. Matched nitrous and nonnitrous patients were compared on 30-day mortality and a set of 8 in-hospital morbidity/mortality outcomes.
RESULTS: Inhalation of N2O intraoperatively was associated with decreased odds of 30-day mortality (odds ratio [OR]: 97.5% confidence interval, 0.67, 0.46-0.97; P = 0.02). Furthermore, nitrous patients had an estimated 17% (OR: 0.83, 0.74-0.92) decreased odds of experiencing major in-hospital morbidity/mortality than nonnitrous (P < 0.001). Among the individual morbidities, intraoperative N2O use was only associated with significantly lower odds of having pulmonary/respiratory morbidities (OR, 95% Bonferroni-adjusted CI: 0.59, 0.44-0.78).
CONCLUSIONS: Intraoperative N2O administration was associated with decreased odds of 30-day mortality and decreased odds of in-hospital mortality/morbidity. Aside from its specific and well-known contraindications, the results of this study do not support eliminating N2O from anesthetic practice.

地塞米松預防接受剖腹手術的子宮內膜癌患者術後噁心嘔吐對術後傷口併發症的影響

The impact of postoperative nausea and vomiting prophylaxis with dexamethasone on postoperative wound complications in patients undergoing laparotomy for endometrial cancer.

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Anesth Analg May 2013 116:1041-1047

背景：地塞米松被廣泛用於預防術後的噁心和嘔吐。然而，也有有限的資料顯示單劑量地塞米松使用會產生傷口併發症的風險。我們進行了回顧性研究，來確認是否術中使用地塞米松預防術後噁心嘔吐會產生或加重術後傷口併發症的風險。
方法：從腫瘤登記處選定了在 2002 年到 2007 年期間接受了剖腹手術的子宮內膜癌女性。圍手術期的記錄進行了審查，使用了地塞米松。對醫療記錄進行了審查，以確定包括淺表手術部位感染，蜂窩組織炎，傷口分離，筋膜裂開的傷口併發症。傷口護理需求和傷口完全癒合時間被比較基於地塞米松的使用與否。傷口併發症的發生率也被比較基於地塞米松的使用劑量。基線特徵和圍手術期的細節被傷口併發症的獨立協會進行了評估。回歸分析進行預測傷口併發症的發生。
結果：431 例符合納入標準，192 例（44.6％）接受地塞米松（4-12 毫克）而且 31.1％產生了傷口併發症。在未經調整的資料分析中看出，地塞米松並的使用與否在產生術後併發症的風險上無顯著差異；192 例中的 53 例（占 27.6％）使用了地塞米松並產生了傷口併發症，相比 239 例中的 81 例（占 33.9％）沒有使用地塞米松：可能比（95％可信區間

[CI]）= 0.74（0.49，1.13），P = 0.16。傷口併發症的類型無顯著差異在使用地塞米松的基礎上（P = 0.71），或在傷口併發症的發生率基於地塞米松的使用劑量（P = 0.48）。發生傷口併發症的患者，需要靜脈使用抗生素，真空輔助傷口閉合，或筋膜裂開率在地塞米松使用與否無顯著差異。傷口癒合的時間無差異（P = 0.48）。進行單因素分析，較高的體重指數，較高的預估失血量，吸煙，且持續時間較長的是產生手術傷口併發症的預測因素。在多變數模型中，吸煙（OR [95％CI]：2.0 [1.3，3.2]，P = 0.003）和體重指數（OR [95％CI]：1.2 [1.1，1.3]，P = 0.0003）是最顯著的可能發生傷口併發症的因素，而地塞米松依然是不顯著的預測（OR [95％CI]：0.7 [0.5，1.1]，P = 0.12）。

結論：術中使用地塞米松預防術後噁心嘔吐似乎並不增加接受開腹手術治療子宮內膜癌的術後併發症比率或術後傷口併發症的嚴重程度。體重指數和吸煙是這個病患族群的傷口併發症的顯著預測影響因數。

（胡曉清譯 薛張綱校）

BACKGROUND: Dexamethasone is widely used for postoperative nausea and vomiting (PONV) prophylaxis. However, there are limited data on the risk of wound complications associated with single-dose dexamethasone use for this purpose. We performed this retrospective study to determine whether intraoperative dexamethasone for PONV prevention increases the risk or severity of postoperative wound complications.

METHODS: Women who underwent laparotomy for endometrial cancer between 2002 and 2007 were identified from a tumor registry. Perioperative records were reviewed to determine dexamethasone administration. Medical records were reviewed to identify wound complications including cellulitis, superficial surgical site infection, wound separation, and fascial dehiscence. Wound care needs and time to complete wound healing were compared based on dexamethasone exposure. The rate of wound complications was also compared based on dexamethasone dose. Baseline characteristics and perioperative details were evaluated for independent associations with wound complications. Logistic regression analyses were performed to predict the occurrence of wound complications.

RESULTS: Four hundred thirty-one patients met inclusion criteria; 192 (44.6%) received dexamethasone (4-12 mg) and 31.1% developed a wound complication. In unadjusted analysis, there was no difference in the risk of developing a wound complication based on dexamethasone exposure; 53 of 192 patients (27.6%) who received dexamethasone developed a wound complication, compared with 81 of 239 (33.9%) who did not receive dexamethasone: odds ratio (OR) (95% confidence interval [CI]) = 0.74 (0.49, 1.13), P = 0.16. There was no difference in the distribution of wound complication types based on receipt of dexamethasone (P = 0.71), or in the incidence of wound complications based on the dose of dexamethasone (P = 0.48). Of patients who developed a wound complication, there was no difference in the need for IV antibiotics, vacuum-assisted wound closure, or in the rate of fascial dehiscence based on dexamethasone exposure. The time to complete wound healing was not different between the 2 cohorts (P = 0.48). In univariate analysis, higher body mass index (BMI), higher estimated blood loss, smoking, and longer duration of surgery were predictors of wound complications. Smoking (OR [95% CI]: 2.0 [1.3, 3.2], P = 0.003) and BMI (OR [95% CI]: 1.2 [1.1, 1.3], P = 0.0003) were the only significant predictors of wound complications in the multivariate model, whereas dexamethasone remained a nonsignificant predictor (OR [95% CI]: 0.7 [0.5, 1.1], P = 0.12).

CONCLUSION: Intraoperative dexamethasone for PONV prophylaxis does not seem to increase the rate or severity of postoperative wound complications in women undergoing laparotomy for

endometrial cancer. BMI and smoking were significant predictors of wound complications in this patient population.

美國惡性高熱易感人群中斯里蘭卡肉毒堿受體 1 基因發生變易

Ryanodine Receptor Type 1 Gene Variants in the Malignant Hyperthermia-Susceptible Population of the United States

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Anesth Analg May 2013 116:1078-1086

背景：編碼骨骼肌特異性胞內鈣離子通道的斯里蘭卡肉毒堿受體 1 基因（）RYR1 的突變是引起惡性高熱（MH）的原因之一。本研究中，我們檢測到了大量沒有事先進行基因診斷的北美洲惡性高熱易感人群中 RYR1 的突變。
方法：在 120 個惡性高熱非易感人群中用分層的方法檢測了 RYR1。二氫吡啶受體基因（CACNA1S）的 α-1 亞基作爲變異被篩選，在受試者 RYR1 中大於等於 100 個外顯子中沒有發現異常。
結果：在 26 個受試者中十大已知的 MH 致病突變基因被發現。 在 36 例受試者中發現不確定的 R YR1 突變，其中 16 個是新的突變。在一例死於惡性高熱的受試者中發現 RYR1 和 CACNA1S 都發生了新的變異。在四個受試者中發現存在兩種 RYR1 變異。不確定的變異被發現有內外兩個 RYR1 熱點。在咖啡因-氟烷收縮試驗中那些具有已知的惡性高熱相關基因突變或具有不確定類型的基因突變的受試者比那些沒有突變的受試者產生更強的最大收縮。
結論：在獨立的惡性高熱家族中識別新型的 RYR1 突變和以前觀察到的意義不明確的 RYR1 突變在證明這些突變對惡性高熱易感性意義上及支持這些基因突變功能研究的需要上是十分必要的。惡性高熱臨床表型的後續報導對於遺傳研究結果的解釋是必要的，特別是因爲大多數的與惡性高熱相關的基因突變的致病性仍有待進一步闡明。
（李麗紅譯 薛張綱校）

BACKGROUND: Mutations in the ryanodine receptor type 1 gene (RYR1) that encodes the skeletal muscle-specific intracellular calcium (Ca(2+)) release channel are a cause of malignant hyperthermia (MH). In this study, we examined RYR1 mutations in a large number of North American MH-susceptible (MHS) subjects without prior genetic diagnosis.
METHODS:RYR1 was examined in 120 unrelated MHS subjects from the United States in a tiered manner. The α-1 subunit of the dihydropyridine receptor gene (CACNA1S) was screened for 4 variants in subjects in whom no abnormality was found in ≥100 exons of RYR1.
RESULTS: Ten known causative MH mutations were found in 26 subjects. Variants of uncertain significance in RYR1 were found in 36 subjects, 16 of which are novel. Novel variants in both

RYR1 and CACNA1S were found in the 1 subject who died of MH. Two RYR1 variants were found in 4 subjects. Variants of uncertain significance were found outside and inside the hotspots of RYR1. Maximal contractures in the caffeine-halothane contracture test were greater in those who had a known MH mutation or variant of uncertain significance in RYR1 than in those who did not.
CONCLUSIONS: The identification of novel RYR1 variants and previously observed RYR1 variants of uncertain significance in independent MHS families is necessary for demonstrating the significance of these variants for MH susceptibility and supports the need for functional studies of these variants. Continued reporting of the clinical phenotypes of MH is necessary for interpretation of genetic findings, especially because the pathogenicity of most of these genetic variants associated with MHS remains to be elucidated.

文獻綜述：評估外科手術持續時間和設施間的比較：識別較低麻醉專業收費設施

Review article: estimating surgical case durations and making comparisons among facilities: identifying facilities with lower anesthesia professional fees.

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Anesth Analg May 2013 116:1103-1115

消費者驅動的醫療依賴于外科手術成本估算的透明度，包括麻醉專業的費用。使用系統的綜述，我們展示了提供麻醉成本要求估計統計每個設施，合理地，平均和 90%以上預測限制了手術時間和過程。預算限制需要計算出，對於很多過程，使用貝葉斯方法基於符合對數正態分佈。保險公司和/或政府缺乏預算時間和過程，實際上因爲設施很大的異構性問題的手段和係數變化的持續時間不能夠推斷這些估計。因此，保險業不能夠從公共和私有的資料庫中提供準確的成本信息。反而保險公司和/或政府能夠通過明顯比平均值更簡短的時間來評估設施。這種設施間時間的比較應該通過校正效果的多重比較表現出來。我們的綜述也直接影響到潛在的更重要的如何研究麻醉時間和病人的發病率和死亡率的問題。當聯營設施時間的資料，應該考慮到大型異構性的手段和設施持續時間的係數變化。（比如：應用“多級”或“層次”模型）
（孫莉萍譯 薛張綱校）

Consumer-driven health care relies on transparency in cost estimates for surgery, including anesthesia professional fees. Using systematic narrative review, we show that providing anesthesia costs requires that each facility (anesthesia group) estimate statistics, reasonably the mean and the 90% upper prediction limit of case durations by procedure. The prediction limits need to be calculated, for many procedures, using Bayesian methods based on the log-normal distribution. Insurers and/or governments lack scheduled durations and procedures and cannot practically infer these estimates because of the large heterogeneities among facilities in the means and coefficients of variation of durations. Consequently, the insurance industry cannot provide the cost information accurately from public and private databases. Instead, the role of insurers and/or governments can be to identify facilities with significantly briefer durations (costs to the patient) than average. Such comparisons of durations among facilities should be

performed with correction for the effects of the multiple comparisons. Our review also has direct implications to the potentially more important issue of how to study the association between anesthetic durations and patient morbidity and mortality. When pooling duration data among facilities, both the large heterogeneity in the means and coefficients of variation of durations among facilities need to be considered (e.g., using "multilevel" or "hierarchical" models).

腰神經內側支射頻消融的另一種遠端途徑方法：一項前瞻性隨機對照研究

An Alternative Distal Approach for the Lumbar Medial Branch Radiofrequency Denervation: A Prospective Randomized Comparative Study

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Anesth Analg May 2013 116:1133-1140

背景：腰神經內側支射頻消融（LMBRFD）可采於包括“遠端途徑”的另一項技術。我們在一項前瞻性隨機試驗中通過與傳統的隧道視覺方法的比較來描述和評估這種技術。
方法：82 位進行腰神經內側支射頻消融的病人，其中 41 位採用遠端途徑，41 位元採用隧道視覺方法。主要評定點是腰痛的 11 點數字評定量表（NRS）平均差異的比較，從入組到 1 個月時的分數（NRS 基數-在 1 個月時的 NRS）和到 6 個月時的分數（NRS 基數-在 6 個月時的 NRS），比較遠端途徑組的隧道視覺方法組的差別。次要評定點是隨著時間的推移 NRS 和 Oswestry 傷殘指數的變化。
結果：各組有 34 例完成全部試驗。NRS 評分變化在各組之間無顯著統計學差異，在 1 個月時（校正 P =0.19; 97.5%的雙相可信區間[CI]：-1.37 至 0.37）和在 6 個月時（校正 P =0.53;97.5%CI：-1.36 至 0.77）。兩組患者在 NRS 和 Oswestry 傷殘指數得分從基數到 1 個月和 6 個月的分數均顯示顯著降低（P <0.0001，Bonferroni 糾正）。手術相關的疼痛評分的在遠端途徑組顯著降低（P = 0.001， 99%CI： -2.00 至-0.23）。
結論：採用隧道視覺方法或遠端途徑的腰神經內側支射頻消融的病人在 6 個月的隨訪中表現出顯著的疼痛緩解。遠端途徑組圍手術期疼痛較少。我們認爲，遠端途徑提供了一個改良的腰神經內側支射頻消融方法。
（郁玲玲譯 薛張綱校）

BACKGROUND: An alternative technique involving a “distal approach” can be used for lumbar medial branch radiofrequency denervation (LMBRFD). We described and assessed this technique by comparing it with a conventional tunnel vision approach in a prospective randomized trial.
METHODS: Eighty-two patients underwent LMBRFD by a distal (n = 41) or a tunnel vision approach (n = 41). The primary end point was a comparison of the mean difference in the change of 11-point numeric rating scale (NRS) scores of low back pain from entry to the scores at 1 month (NRS at baseline—NRS at 1 month) and at 6 months (NRS at baseline—NRS at 6 months) between the distal approach group and the tunnel vision approach group. The secondary end points were a change of NRS and the Oswestry disability index over time.

RESULTS: Thirty-four patients in each group had complete time courses. There were no statistically significant differences in the change of NRS scores between the groups at 1 month (corrected P = 0.19; 97.5% 2-sided confidence interval [CI], −1.37 to 0.37) and 6 months (corrected P = 0.53; 97.5% CI, −1.36 to 0.77). Patients in both groups showed a statistically significant reduction in NRS and Oswestry disability index scores from baseline to that of the scores at 1 and 6 months (all P < 0.0001, Bonferroni corrected). The procedure-related pain score was significantly lower in the distal approach group (P = 0.001; 99% CI, −2.00 to −0.23).
CONCLUSIONS: Patients who underwent LMBRFD by the tunnel vision or distal approaches showed significant pain relief at the 6-month follow-up. Less periprocedural pain was reported in the distal approach group. We consider that the distal approach provides an improved option for LMBRFD.

腘坐骨神經分支及分支遠端神經阻滯效果的隨機試驗

A randomized comparison between bifurcation and prebifurcation subparaneural popliteal sciatic nerve blocks.

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Anesth Analg May 2013 116:1170-1175

背景：在此前瞻、 隨機、 雙盲觀察試驗中，我們比較了超聲引導下腘坐骨神經分支神經(B)或其遠端阻滯的效果。我們假設分支遠端神經阻滯(PB)技術將減少麻醉相關的總時間（性能和發病時間的總和）。
方法：68 患者進行了超聲引導下後腘坐骨神經阻滯。所有受試物件均給予標準劑量（30 毫升）的麻藥劑 (1 %利多卡因-0.25%布比卡因 5 微克/毫升腎上腺素） 的組合。PB 組中，局部麻醉解決方案被存放在常見坐骨神經樹幹，向其圓形和橢圓形的超聲表現，腘神經鞘內之間的交集只是遠端的一級。B 組中，在脛骨和腓骨各部門之間鞘內進行了注射。一名雙盲的觀察員記錄的成功率（完整脛骨和腓骨的感覺消失在 30 分鐘） 和發病時間。性能時，針刀路和不良事件（異感，神經水腫） 數目也錄得。所有科目都聯繫了 7 天后的手術，詢問持久性麻木或運動不能的存在。
結果:這兩種技術得到類似的成功率 (85%-88%； 95%可信區間 [CI] 的組間差異，-14%至 19%) 和所需時間性能相似（8.1 分鐘 ； 95 %ci 的差別，-1.65 到 1.71 幾分鐘），起效時間 （15.0-17.7 分鐘 ； 95 %ci 的差異，-7.65 到 2.31 幾分鐘），和總麻醉相關的時間和 (23.4-26.0 分鐘; 95 %ci 的差異，-7.83 到 2.74 分鐘)。針刀路的數目和異感（25%-34%）的發生率在 2 組之間也是類似的。PB 組和 B 組中各有 2 名和 3 名病人出現神經腫脹的症狀，在檢測到。這 5 例病人均小心進針和注射。術後一周隨訪患者，2 名 病人尚有下肢麻木。最終在之後的一個月內症狀均消失。
結論：當腘神經鞘內注射局麻藥後，B 和 PB 後腘坐骨神經阻滯均能得到類似的成功與麻醉相關的總次數。然而，由於 95%可信區間較大，我們不能排除組間差異的 19%和 7.83 分鐘可能未被檢測到的成功率和總時間的可能性。
（楊琰譯 薛張綱校）
BACKGROUND: In this prospective, randomized, observer-blinded trial, we compared ultrasound-guided subparaneural popliteal sciatic nerve blocks performed either at or proximal to

the neural bifurcation (B). We hypothesized that the total anesthesia-related time (sum of performance and onset times) would be decreased with the prebifurcation (PB) technique.
METHODS: Ultrasound-guided posterior popliteal sciatic nerve block was performed in 68 patients. All subjects received an identical volume (30 mL) and mix of local anesthetic agent (1% lidocaine-0.25% bupivacaine-5 μg/mL epinephrine). In the PB group, the local anesthetic solution was deposited at the level of the common sciatic trunk, just distal to the intersection between its circular and elliptical sonographic appearances, inside the paraneural sheath. In the B group, the injection was performed inside the sheath between the tibial and peroneal divisions. A blinded observer recorded the success rate (complete tibial and peroneal sensory block at 30 minutes) and onset time. The performance time, number of needle passes, and adverse events (paresthesia, neural edema) were also recorded. All subjects were contacted 7 days after the surgery to enquire about the presence of persistent numbness or motor deficit.
RESULTS: Both techniques resulted in comparable success rates (85%-88%; 95% confidence interval [CI] of the intergroup difference, -14% to 19%) and required similar performance times (8.1 minutes; 95% CI of the difference, -1.65 to 1.71 minutes), onset times (15.0-17.7 minutes; 95% CI of the difference, -7.65 to 2.31 minutes), and total anesthesia-related times (23.4-26.0 minutes; 95% CI of the difference, -7.83 to 2.74 minutes). The number of needle passes and incidence of paresthesia (25%-34%) were also similar between the 2 groups. Sonographic neural swelling was detected in 2 and 3 subjects in the PB and B groups, respectively. In all 5 cases, the needle was carefully withdrawn and the injection completed uneventfully. Patient follow-up 1 week after the surgery revealed 2 patients with residual numbness. In both instances, the latter had resolved by 1 month.
CONCLUSION: When local anesthetic is injected inside the paraneural sheath, B and PB posterior popliteal sciatic nerve blocks result in comparable success and total anesthesia-related times. However, in light of the 95% CIs, we cannot exclude the possibility that an intergroup difference of 19% and 7.83 minutes might have gone undetected for success rate and total time, respectively.

輸血後紅細胞變形性的下降以及紅細胞保存時間對其的影響

Decreased Erythrocyte Deformability After Transfusion and the Effects of Erythrocyte Storage Duration

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Anesth Analg May 2013 116:975-981;

背景：紅細胞在儲存時細胞膜會發生形態學上的改變，但不清楚這種改變是否可逆。我們評估患者輸血前後紅細胞膜的變形性來判定儲存時間的影響以及變形性的改變能否在輸血後可逆轉。
方法：16 個進行後路脊椎融合術的病人納入本研究中。我們對那些需要中等輸血量（≥5 個單位紅細胞）的病人和那些需要少量輸血（0—4 個單位紅細胞）的病人進行紅細胞變形性的比較。分別測定輸血前直接從儲血袋中取出來的血樣本、病人的血樣本以及病人輸

血後的血樣本（術後 3 天）的紅細胞變形性。對於從儲血袋中提取的血樣本，我們比較了長時間儲存的紅細胞 (≥21 天)、短時間儲存的紅細胞(<21 天)以及自體血回收的紅細胞的變形性。變形能力是使用細胞變形計量法測出的延伸指數定量評估的，這是一種測定細胞在剪切應力下延伸能力的方法。

結果：病人在輸入中等血量之後，其紅細胞變形性較術前基線顯著下降 (EI 下降了 12% ± 4% 到 20% ± 6%; *P* = 0.03)，但輸小量血後無變化(EI 下降了 3% ± 1%到 4% ± 1%; *P* = 0.68)。且此些改變術後 3 天不能恢復。保存時間≥21 天的紅細胞變形性(EI = 0.28 ± 0.02)明顯差於保存時間<21 天的(EI = 0.33 ± 0.02; *P* = 0.001)或是病人術前採集的紅細胞變形性(EI = 0.33 ± 0.02; *P* = 0.001)。回收血紅細胞變形性處於中間水準(EI = 0.30 ± 0.03)，好於保存時間≥21 天的儲存血(*P* = 0.047)，但差於保存時間<21 天的儲存血(*P* = 0.03)。

結論：本研究證實紅細胞保存時間的延長與其細胞膜變形性的下降相關，並且這種改變在輸血後很難逆轉。

（王慧娟 譯 馬皓琳 李士通 校）

BACKGROUND: Erythrocyte cell membranes undergo morphologic changes during storage, but it is unclear whether these changes are reversible. We assessed erythrocyte cell membrane deformability in patients before and after transfusion to determine the effects of storage duration and whether changes in deformability are reversible after transfusion.

METHODS: Sixteen patients undergoing posterior spinal fusion surgery were studied. Erythrocyte deformability was compared between those who required moderate transfusion (≥5 units erythrocytes) and those who received minimal transfusion (0–4 units erythrocytes). Deformability was measured in samples drawn directly from the blood storage bags before transfusion and in samples drawn from patients before and after transfusion (over 3 postoperative days). In samples taken from the blood storage bags, we compared deformability of erythrocytes stored for a long duration (≥21 days), those stored for a shorter duration (<21 days), and cell-salvaged erythrocytes. Deformability was assessed quantitatively using the elongation index (EI) measured by ektacytometry, a method that determines the ability for the cell to elongate when exposed to shear stress.

RESULTS: Erythrocyte deformability was significantly decreased from the preoperative baseline in patients after moderate transfusion (EI decreased by 12% ± 4% to 20% ± 6%; *P* = 0.03) but not after minimal transfusion (EI decreased by 3% ± 1% to 4% ± 1%; *P* = 0.68). These changes did not reverse over 3 postoperative days. Deformability was significantly less in erythrocytes stored for ≥21 days (EI = 0.28 ± 0.02) than in those stored for <21 days (EI = 0.33 ± 0.02; *P* = 0.001) or those drawn from patients preoperatively (EI = 0.33 ± 0.02; *P* = 0.001). Cell-salvaged erythrocytes had intermediate deformability (EI = 0.30 ± 0.03) that was greater than that of erythrocytes stored ≥21 days (*P* = 0.047), but less than that of erythrocytes stored <21 days (*P* = 0.03).

CONCLUSIONS: The findings demonstrate that increased duration of erythrocyte storage is associated with decreased cell membrane deformability and that these changes are not readily reversible after transfusion.

基於主動脈流速度和外周動脈壓力分佈圖的一種微創心輸出量監測系統

A Minimally Invasive Monitoring System of Cardiac Output Using Aortic Flow Velocity and Peripheral Arterial Pressure Profile

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Anesth Analg May 2013 116:1006-1017

背景：在對血流動力學不穩定的患者管理中，心輸出量（CO）的監測可以提供關鍵診斷資料。然而傳統的 CO 檢測方法是有創傷的、不連續的，和/或錯誤的。本文旨在驗證我們新開發的 CO 監測系統。
方法：本系統應用連續波多普勒心超心動圖自動測定升主動脈流量的流速峰值，並用橈動脈壓的脈搏輪廓線估算心臟射血時間及主動脈橫截面積。連續處理這些參數來估算 CO（CO_{est}）。在用大動脈流量探測器測量參考 CO（CO_{ref}）的 10 個麻醉的閉胸狗中，輸注心血管藥物或隨機心房起搏，使的血流動力學情況在大範圍內變化。在每個情況下，測定 CO_{ref}和 CO_{est}。對於每一個動物，測定 CO_{ref}和 CO_{est}相對於對應基線值絕對變化值 ΔCO_{ref}和 ΔCO_{est}及相對變化值$\%\Delta CO_{ref}$和$\%\Delta CO_{est}$。用 CO_{ref}校準 CO_{est}以獲取相應的按比例分級的 CO_{est}（CO_{est}^{N}）。
結果：共獲取 1335 組 CO_{ref} 及 CO_{est}資料，其中 CO_{ref}的範圍爲 0.17 到 5.34 L/min。比較 CO_{ref}和 CO_{est}的 Bland–Altman 分析表明，一致限（偏差± 1.96 × 差異的 SD）爲−1.01~1.13 L/min (95% 置信區間, −1.76 ~ 1.88 L/min)，百分誤差（1.96 × 差異的 SD /[平均 CO] × 100）爲 43%。CO_{ref} 與 CO_{est}^{N}的一致改善，其一致限爲−0.53 ~ 0.49 L/min (95% 置信區間, −0.62 ~ 0.59 L/min)，百分誤差爲 20%。比較 ΔCO_{ref}及 ΔCO_{est}的極性圖分析表明極角的平均值± 1.96 × SD 爲−2° ± 22°。四象限圖分析表明$\%\Delta CO_{est}$ 與 $\%\Delta CO_{ref}$ 有較大的相關性(R^2 = 0.93)。95%的資料組表明$\%\Delta CO_{est}$ 與 $\%\Delta CO_{ref}$變化方向相同。在連續方式及隨機心房起搏的情況下系統保留了較好的可靠性。
結論：在大範圍的血液動力學條件下，不考慮心臟跳動的不規則性，本系統能具微創監測 CO，並有較好的趨向能力。這些結果表明，需要對該系統做進一步的研究和開發，以便將來的臨床應用。
（趙曉 譯　馬皓琳 李士通 校）

BACKGROUND: In managing patients with unstable hemodynamics, monitoring cardiac output (CO) can provide critical diagnostic data. However, conventional CO measurements are invasive, intermittent, and/or inaccurate. The purpose of this study was to validate our newly developed CO monitoring system.
METHODS: This system automatically determines peak velocity of the ascending aortic flow using continuous-wave Doppler transthoracic echocardiography and estimates cardiac ejection time and aortic cross-sectional area using the pulse contour of the radial arterial pressure. These parameters are continuously processed to estimate CO (CO_{est}). In 10 anesthetized closed-chest dogs instrumented with an aortic flowprobe to measure reference CO (CO_{ref}), hemodynamic conditions were varied over wide ranges by infusing cardiovascular drugs or by random atrial pacing. Under each condition, CO_{ref} and CO_{est} were determined. Absolute changes of CO_{ref} (ΔCO_{ref}) and CO_{est} (ΔCO_{est}), and relative changes of CO_{ref} ($\%\Delta CO_{ref}$) and CO_{est} ($\%\Delta CO_{est}$) from the corresponding baseline values were determined in each animal. We calibrated CO_{est} against CO_{ref} to obtain proportionally scaled CO_{est} (CO_{est}^{N}).
RESULTS: A total of 1335 datasets of CO_{ref} and CO_{est} were obtained, in which CO_{ref} ranged from 0.17 to 5.34 L/min. Bland–Altman analysis between CO_{ref} and CO_{est} indicated that the limits of agreement (the bias ± 1.96 × SD of the difference) and the percentage error (1.96 × [SD of the difference]/[mean CO] × 100) were from −1.01 to 1.13 L/min (95% confidence interval,

−1.76 to 1.88 L/min) and 43%, respectively. The agreement between CO_{ref} and $CO_{est}{}^{N}$ was improved, with limits of agreement from −0.53 to 0.49 L/min (95% confidence interval, −0.62 to 0.59 L/min) and the percentage error of 20%. Polar plot analysis between ΔCO_{ref} and ΔCO_{est} indicated that mean ± 1.96 × SD of polar angle was −2° ± 22°. Four quadrant plot analysis indicated that $\%\Delta CO_{est}$ correlated tightly with $\%\Delta CO_{ref}$ ($R^2 = 0.93$). The $\%\Delta CO_{est}$ and $\%\Delta CO_{ref}$ changed in the same direction in 95% of the datasets. Reliability of this system was well preserved under conditions of random atrial pacing and also in a continuous manner.
CONCLUSION: Over a wide range of hemodynamic conditions, irrespective of cardiac beat irregularity, this system may allow minimally invasive monitoring of CO with a good trending ability. The present results warrant further research and development of this system for future clinical application.

POISE 試驗中氧化亞氮與嚴重的發病率及死亡率

Nitrous Oxide and Serious Morbidity and Mortality in the POISE Trial

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Anesth Analg May 2013 116:1034-1040

背景：在對圍術期缺血評估（POISE）試驗的析因亞分析中，我們想闡明氧化亞氮是否與隨機化的 30 天內心血管性死亡、非致命性的心肌梗塞（MI）及非致命性的心臟驟停的的主要複合預後有關。
方法：圍術期服用 β 阻滯劑的 POISE 試驗共納入了 8351 名患者。氧化亞氮麻醉被定義爲在全麻（無論是否合用椎管內阻滯或外周神經阻滯）複合使用氧化亞氮。使用評估傾向評分的反概率權重邏輯回歸分析來衡量氧化亞氮與患者主要預後、心肌梗塞、腦卒中、死亡及有臨床意義的低血壓之間的關係。
結果：在本研究納入的 5133 名患者中有 1489 名（29%）實施了氧化亞氮麻醉。氧化亞氮對主要預後（112 [7.5%] vs 248 [6.9%]; 比值比[OR], 1.08; 95%可信區間 [CI], 0.82–1.44; 99% CI, 0.75–1.57; *P* = 0.58）、心肌梗塞（89 [6.0] vs 204 [5.6]; OR, 0.99; 95% CI, 0.75–1.31; 99% CI, 0.69–1.42; *P* = 0.94）、腦卒中（6 [0.4%] vs 28 [0.8%]; OR, 0.85; 95% CI, 0.26–2.82; 99% CI, 0.17–4.11; *P* = 0.79）、死亡（40 [2.7%] vs 100 [2.8%]; OR, 1.04; 95% CI, 0.6–1.81; 99% CI, 0.51–2.15; *P* = 0.88）及臨床有意義的低血壓（219 [14.7%] vs 544 [15.0%]; OR, 0.92; 95% CI, 0.74–1.15; 99% CI, 0.70–1.23; *P* = 0.48）的風險均無顯著影響。
結論：在 POISE 試驗的這個析因亞分析中，氧化亞氮與不良預後風險的增加無關。該分析的不足在於：原始資料觀察性質及氧化亞氮的給予濃度和持續時間的資訊缺失。需要進一步進行隨機對照試驗證據。
（王贇譯，馬皓琳、李士通校）
BACKGROUND: In this post hoc subanalysis of the Perioperative Ischemic Evaluation (POISE) trial, we sought to determine whether nitrous oxide was associated with the primary composite outcome of cardiovascular death, nonfatal myocardial infarction (MI), and nonfatal cardiac arrest within 30 days of randomization.
METHODS: The POISE trial of perioperative β-blockade was undertaken in 8351 patients. Nitrous oxide anesthesia was defined as the coadministration of nitrous oxide in patients receiving general anesthesia, with or without additional neuraxial blockade or peripheral nerve blockade. Logistic regression, with inverse probability weighting using estimated propensity scores, was used to determine the association of nitrous oxide with the primary outcome, MI, stroke, death, and clinically significant hypotension.
RESULTS: Nitrous oxide was administered to 1489 (29%) of the 5133 patients included in this analysis. Nitrous oxide had no significant effect on the risk of the primary outcome (112 [7.5%] vs 248 [6.9%]; odds ratio [OR], 1.08; 95% confidence interval [CI], 0.82–1.44; 99% CI, 0.75–1.57; *P* = 0.58), MI (89 [6.0] vs 204 [5.6]; OR, 0.99; 95% CI, 0.75–1.31; 99% CI, 0.69–1.42; *P* = 0.94), stroke (6 [0.4%] vs 28 [0.8%]; OR, 0.85; 95% CI, 0.26–2.82; 99% CI, 0.17–4.11; *P* = 0.79), death (40 [2.7%] vs 100 [2.8%]; OR, 1.04; 95% CI, 0.6–1.81; 99% CI, 0.51–2.15; *P* = 0.88) or clinically significant hypotension (219 [14.7%] vs 544 [15.0%]; OR, 0.92; 95% CI, 0.74–1.15; 99% CI, 0.70–1.23; *P* = 0.48).
CONCLUSIONS: In this post hoc subanalysis, nitrous oxide was not associated with an increased risk of adverse outcomes in the POISE trial patients. This analysis was limited by the observational nature of the data and the lack of information on the concentration and duration of nitrous oxide administration. Further randomized controlled trial evidence is required.

妊娠期高血壓患者的動脈順應性改變與先兆子癇相關

Altered Arterial Compliance in Hypertensive Pregnant Women Is Associated with Preeclampsia

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Anesth Analg May 2013 116:1050-1056

背景：血管改變存在於患有先兆子癇的孕婦中。這項研究中，我們評估了妊娠期高血壓患者的動脈順應性。我們假設先兆子癇孕婦的動脈順應性降低。
方法：43 名進行先兆子癇評估的妊高症患者參與了研究。收集有關每位元患者和妊娠的臨床資料。通過橈動脈張力測量法來評估大動脈的順應性（C1）和小動脈的順應性（C2），同時患者進行實驗室檢查來診斷先兆子癇。我們記錄了分娩時的孕齡以及新生兒的資料。
結果：18 名患者診斷爲先兆子癇。先兆子癇患者較高血壓無蛋白尿患者的 C2 水準低（均數± 標準差，4.5 ± 1.3 比 5.9 ± 2.3 mL/mm Hg ·100，*P* = 0.013，差異的 95%可信區間[CI] 0.32–2.55），但是 C1 水準沒有差異。在先兆子癇患者組，C2 水準與同一天測得的尿總蛋白含量（Spearman ρ = −0.4，*P* = 0.047，95% CI 上限 −0.01）和首次出現高血壓的孕齡（Spearman ρ = 0.59， *P* = 0.010，95% CI 下限 0.17）相關。單胎妊娠中，C2 同時與分娩時測得的新生兒體重相關（Spearman ρ = 0.43，*P* = 0.009，95% CI 下限 0.11）。在評估順應性時患高血壓但無蛋白尿，但是後來發展爲先兆子癇的患者（*n*=6），其 C2 水準與較早診斷爲先兆子癇的患者相似（平均差異 0.37 mL/mm Hg ·100，95% CI −2.42 至 1.67），與診斷爲妊娠期高血壓患者相比（*P* = 0.019，95% CI 0.33–4.42 mL/mm Hg · 100），其 C2 水準較低。
結論：動脈彈性的無創評估可促進有關妊娠導致高血壓病的病理生理狀態的特徵描述。通過 C2 評估的小動脈血管改變，可以反映先兆子癇患者的血管改變程度。
（張怡 譯 馬皓琳 李士通 校）

BACKGROUND: Vascular alterations are present in pregnant women affected by preeclampsia. In this study, we assessed arterial compliance in women affected by hypertensive disorders of pregnancy. We hypothesized that arterial compliance is reduced in women affected by preeclampsia.
METHODS: Forty-three hypertensive pregnant women undergoing evaluation for preeclampsia were studied. Clinical data about each patient and pregnancy were collected. Large (C1) and small (C2) artery compliance were assessed by radial tonometry, while the patients underwent laboratory tests to diagnose preeclampsia. At the time of delivery, gestational age and newborn data were recorded.
RESULTS: Eighteen women were diagnosed with preeclampsia. C2 levels were lower among preeclamptic versus hypertensive aproteinuric women (mean ± SD, 4.5 ± 1.3 vs 5.9 ± 2.3 mL/mm Hg ·100, *P* = 0.013, 95% confidence interval [CI] of difference 0.32–2.55), whereas C1 levels did not differ. In the preeclampsia group, C2 levels correlated with urine total protein concentrations measured the same day (Spearman ρ = −0.49, *P* = 0.047, upper 95% CI −0.01) and with gestational age at first occurrence of hypertension (Spearman ρ = 0.59, *P* = 0.010, lower 95% CI 0.17). Among singleton gestations, C2 also correlated with newborn birth weight measured at delivery (Spearman ρ = 0.43, *P* = 0.009, lower 95% CI 0.11). Women who were

hypertensive but aproteinuric at the time of compliance assessment, but who subsequently developed preeclampsia (n = 6), had C2 levels similar to those with an early diagnosis of preeclampsia (mean difference 0.37 mL/mm Hg ·100, 95% CI −2.42 to 1.67) and lower C2 levels than women diagnosed with gestational hypertension (P = 0.019, 95% CI 0.33–4.42 mL/mm Hg ·100).
CONCLUSIONS: The noninvasive assessment of arterial elasticity may contribute toward characterization of the nature of the pathophysiology in pregnancy-induced hypertensive disorders. The vascular alterations of the small arteries, as assessed by C2, may reflect the extent of vascular alterations present with preeclampsia.

在預料靜脈通路開放困難的嬰兒和兒童中，靜脈可視血管成像系統使有經驗護士的首次嘗試置管成功率降低

The VeinViewer Vascular Imaging System Worsens First-Attempt Cannulation Rate for Experienced Nurses in Infants and Children with Anticipated Difficult Intravenous Access
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Anesth Analg May 2013 116:1087-1092

背景：靜脈可視裝置（Luminetx，田納西州孟菲斯）通過在皮膚表面突出顯示皮下血管成像來幫助確認靜脈。我們測試了這樣一個主要的假設，即靜脈可視裝置提高了熟練護士對預料靜脈通路開放困難的兒科病人的置套成功率。另一個目標是評估肥胖和置管成功率之間的關係。
方法：納入了 0-18 歲的病人。由困難靜脈通路分數來評估預計的置管困難程度。所有的置管均由進行靜脈通路組成員操作。隨機把病人分組：（1）常規的靜脈內置管和（2）靜脈可視裝置說明下置管。主要的觀察結果是首次嘗試置管成功。用 Cochran-Mantel-Haenszel 卡方分析評估成功置管的比例來調整任何不平衡的基線變數。用多元邏輯回歸來評估肥胖對置管成功的影響。
結果：299 個病人（49%）隨機分組到靜脈可視裝置，301 個病人（51%）則分組到普通的置管。在用靜脈可視裝置的病人中首次置管的成功率是 47%，而普通的置管組病人中的成功率是 62%，有一個可調的相對"風險"（95%可信區間）爲 0.76（0.63-0.91）。Z 統計量爲−3.6 超過了"有害"邊界（Z < −2.41），對應的 P 值爲 0.0003。試驗在統計層面被停止，因爲主要觀察指標超過了"有害"邊界。在調整了基線變數後初次置管成功和 4 種肥胖分類水準之間沒有關係（P = 0.94）。
結論：靜脈可視裝置使經驗護士的初次靜脈置管成功率下降。奇怪的是，肥胖未使靜脈置管的首次嘗試成功率下降。
(王曉莉譯 馬皓琳 李士通校)
BACKGROUND: The VeinViewer (Luminetx, Memphis, TN) helps identify veins by projecting an image of subcutaneous vasculature on the skin surface. We tested the primary hypothesis that VeinViewer use improves cannulation success by skilled nurses in pediatric patients with anticipated difficult IV access. A secondary goal was to evaluate the relationship between obesity and cannulation success.

METHODS: Patients aged 0 to 18 years were included. Anticipated cannulation difficulty was evaluated with the difficult IV access score. All cannulations were performed by members of the Intravenous Access Team. Patients were randomized to: (1) routine IV catheter insertion; or (2) insertion facilitated by the VeinViewer. The primary outcome was first-attempt insertion success. The proportion of successful insertions was evaluated using Cochran-Mantel-Haenszel χ^2 analysis to adjust for any imbalanced baseline variables. The effect of obesity on cannulation success was evaluated with multivariable logistic regression.
RESULTS: Two hundred ninety-nine patients (49%) were randomly assigned to VeinViewer and 301 (51%) to routine cannulation. First-attempt cannulation success was 47% in patients assigned to VeinViewer vs 62% in patients assigned to routine cannulation, with an adjusted relative "risk" (95% confidence interval), of 0.76 (0.63–0.91). The Z-statistic of −3.6 crossed the "harm" boundary ($Z < -2.41$), with corresponding *P* value of 0.0003. The trial was stopped on statistical grounds since the harm boundary for the primary outcome was crossed. There was no association between first-attempt success and the 4-level categorization of obesity after adjusted for baseline variables ($P = 0.94$).
CONCLUSIONS: The VeinViewer worsened first-attempt IV insertion success by skilled nurses. Surprisingly, first-attempt success for IV cannulation was not worsened by obesity.

糖尿病和非糖尿病患者在非心臟大手術中的高血糖反應和甾類藥物的附加作用

The Hyperglycemic Response to Major Noncardiac Surgery and the Added Effect of Steroid Administration in Patients With and Without Diabetes

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Anesth Analg May 2013 116:1116-1122;

背景：目前尚不清楚手術應激所致高血糖反應的模式和程度、低劑量甾類藥物的附加作用、以及這些情況在糖尿病和非糖尿病患者中是否存在差異。因此，本研究旨在驗證如下兩個假說：（1）糖尿病患者從術前到術中的血糖濃度升高比非糖尿病患者更明顯；（2）給予甾類藥物增進了術中血糖升高，在糖尿病患者比非糖尿病患者更明顯。
方法：研究納入物件爲擇期在全麻下行非心臟大手術的患者，根據糖尿病診斷分層，隨機接受術前 8mg 地塞米松或安慰劑靜脈注射。患者爲一項更大型試驗（地塞米松、淺麻醉和嚴格血糖控制[DeLiT]試驗）的一部分。當血糖濃度大於 215 mg/dL 時給予靜脈胰島素注射。主要測量指標爲從術前到術中最大血糖濃度時的血糖變化。本研究也報導了術中血糖升高的時間依賴性模式。
結果：患者隨機分組，90 例患者（23%患有糖尿病）給予地塞米松，95 例患者（29%患有糖尿病）給予安慰劑。從術前血糖濃度到術中最大血糖濃度的變化均數±標準差在糖尿病患者中爲 63 ± 69 mg/dL，在非糖尿病患者中爲 72 ± 45 mg/dL。非糖尿病患者的平均變數調整後變化值（95%可信區間）比糖尿病患者高 29 (13, 46) mg/dL（$P < 0.001$）。對所有患者而言，平均血糖在從術前至切皮時升高輕微，從切皮至手術中點升高顯著，此後維持在高水準且在蘇醒過程中相當穩定，非糖尿病患者血糖升高更明顯（$P < 0.001$）。非糖尿病患者給予地塞米松後平均血糖濃度增加值（97.5%可信區間）比給予安慰劑後高 29 (9, 49) mg/dL ($P = 0.0012$)。但糖尿病患者中無地塞米松效應。

結論：對於術中高血糖的治療，應考慮不同手術階段的高血糖手術應激反應趨勢和甾類藥物的附加效應。爲了避免高血糖反應而拒絕使用甾體藥物預防術後噁心嘔吐的行爲，必須根據甾體類藥物對術中血糖濃度的有限作用而重新考慮。
（陳彬彬 譯， 馬皓琳、李士通 審校）

BACKGROUND: The pattern and magnitude of the hyperglycemic response to surgical stress, the added effect of low-dose steroids, and whether these differ in diabetics and nondiabetics remain unclear. We therefore tested 2 hypotheses: (1) that diabetics show a greater increase from preoperative to intraoperative glucose concentrations than nondiabetics; and (2) that steroid administration increases intraoperative hyperglycemia more so in diabetics compared with nondiabetics.
METHODS: Patients scheduled for major noncardiac surgery under general anesthesia were enrolled and randomized to preoperative IV 8 mg dexamethasone or placebo, stratified by diagnosis of diabetes. Patients were part of a larger underlying trial (the Dexamethasone, Light Anesthesia and Tight Glucose Control [DeLiT] Trial). IV insulin was given when glucose concentration exceeded 215 mg/dL. The primary outcome measure was the change in glucose from the preoperative to maximal intraoperative glucose concentration. We also report the time-dependent pattern of intraoperative hyperglycemia.
RESULTS: Ninety patients (23% with diabetes) were randomized to dexamethasone, and 95 (29% with diabetes) were given placebo. The mean ± SD change from preoperative to maximal intraoperative glucose concentration was 63 ± 69 mg/dL in diabetics and 72 ± 45 mg/dL in nondiabetics. The mean covariable-adjusted change (95% confidence interval) in nondiabetics was 29 (13, 46) mg/dL more than in diabetics ($P < 0.001$). For all patients combined, mean glucose increased slightly from preoperative to incision, substantially from incision to surgery midpoint, and then remained high and fairly stable through emergence, with nondiabetic patients showing a greater increase ($P < 0.001$). For nondiabetics, the mean increase in glucose concentration (97.5% CI) was 29 (9, 49) mg/dL more in patients given dexamethasone than placebo ($P = 0.0012$). However, there was no dexamethasone effect in diabetics ($P = 0.99$).
CONCLUSIONS: Treatment of intraoperative hyperglycemia should account for the hyperglycemic surgical stress response trend depending on the stage of surgery as well as the added effects of steroid administration. Denying steroid prophylaxis for postoperative nausea and vomiting for fear of hyperglycemic response should be reconsidered given the limited effect of steroids on intraoperative blood glucose concentrations.

局麻藥的預防性鎮痛：周圍神經阻滯和靜脈用藥降低術後疼痛

Preventive Analgesia by Local Anesthetics: The Reduction of Postoperative Pain by Peripheral Nerve Blocks and Intravenous Drugs

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Anesth Analg May 2013 116:1141-1161

局麻藥應用於減輕術後急性疼痛已有很長的歷史，但是近期並沒有系統回顧的報導。此外，入選的臨床試驗必須符合隨機和盲法的最低標準。在這篇綜述中，我們應用了嚴格的

臨床研究設計標準來鑒別關於圍手術期局麻藥應用的文獻。我們首先檢驗了適用於不同外科手術的幾種外周神經阻滯方法，然後我們檢驗了計劃性地給予靜脈注射局麻藥（利多卡因）以減輕術後疼痛的效果。最後，我們檢驗了在周圍神經阻滯操作後不同時間節點血管內局麻藥的濃度，並標明血管內藥物濃度水準達到計劃性靜脈注射給藥濃度時的發生率的文獻。重要的是，在這篇綜述中不包含應用了椎管內神經阻滯方法（硬膜外和脊麻）的大量研究，此類研究將在今後的綜述中單獨探討。總的結果顯示了不論哪種途徑，局麻藥的應用對術後疼痛評分的下降和鎮痛藥（阿片類）用量減少都有強陽性的效果。僅在少數情況下影響不明顯。添加輔助用藥的效應增強作用也並非都明顯。手術前、術中或者術後即刻用局麻藥的效果沒有明顯差別。總的結論是：在術後急性期應用局麻藥有顯著抗痛覺過敏效應，術中使用局麻藥對於此效應來說沒有必要。

（盛嘉君 譯 馬皓琳 李士通校）

The use of local anesthetics to reduce acute postoperative pain has a long history, but recent reports have not been systematically reviewed. In addition, the need to include only those clinical studies that meet minimum standards for randomization and blinding must be adhered to. In this review, we have applied stringent clinical study design standards to identify publications on the use of perioperative local anesthetics. We first examined several types of peripheral nerve blocks, covering a variety of surgical procedures, and second, we examined the effects of intentionally administered IV local anesthetic (lidocaine) for suppression of postoperative pain. Thirdly, we have examined publications in which vascular concentrations of local anesthetics were measured at different times after peripheral nerve block procedures, noting the incidence when those levels reached ones achieved during intentional IV administration. Importantly, the very large number of studies using neuraxial blockade techniques (epidural, spinal) has not been included in this review but will be dealt with separately in a later review. The overall results showed a strongly positive effect of local anesthetics, by either route, for suppressing postoperative pain scores and analgesic (opiate) consumption. In only a few situations were the effects equivocal. Enhanced effectiveness with the addition of adjuvants was not uniformly apparent. The differential benefits between drug delivery before, during, or immediately after a surgical procedure are not obvious, and a general conclusion is that the significant antihyperalgesic effects occur when the local anesthetic is present during the acute postoperative period, and its presence during surgery is not essential for this action.