(1:100 000) to help with haemostasis, but you have always been told that this can cause finger necrosis and that it should never be done. You wonder whether in fact this is true and decide to look at the evidence for yourself.

Search strategy

Medline search using Pubmed "Anesthesia"[MeSH] OR "Anesthesia, Local"[MeSH] OR "Nerve Block"[MeSH] AND "Epinephrine"[MeSH] AND "Fingers"[MeSH].

Outcome

Sixteen papers were retrieved, of which seven were found to be relevant, including two randomised control trials, three observational studies and two reviews (table 2).

Comments

Two review articles carefully examined the previously reported cases and found that no case had epinephrine as the sole cause of ischaemic complication. Two studies examined the digital perfusion using Doppler flow, and concluded that the blood flow returned to normal by 1 h after epinephrine injection. Other randomised and observational studies showed longer duration of anaesthesia, better analgesia, less need for tourniquets and no ischaemic damage with the use of epinephrine.

This is clearly a controversial topic as it has been emergency medicine dogma that vasoconstrictive agents should not be used in digits. However, the evidence does not support this assertion for all patients. Clinicians may decide to use low concentration epinephrine when they feel this may help the procedure and where there is no underlying reason not to do so.

► CLINICAL BOTTOM LINE

In the absence of underlying vascular compromise, epinephrine (1:200 000 to 1:100 000) is safe to use in digital blocks along with local anaesthetics.

Sylaidis P, Logan A. Digital blocks with adrenaline. An old dogma refuted. *J Hand Surg (Br)* 1998;**23**:17–19.

Wilhelmi BJ, Blackwell SJ, Miller J, et al. Epinephrine in digital blocks: revisited. *Ann Plast Surg* 1998;**41**:410–4.

Wilhelmi BJ, Blackwell SJ, Miller JH, et al. Do not use epinephrine in digital blocks: myth or truth? *Plast Reconstr Surg* 2001;**107**:393–7.

Denkler K. A comprehensive review of epinephrine in the finger: to do or not to do. *Plast Reconstr Surg* 2001;**108**:114–24.

Altinyazar HC, Ozdemir H, Koca R, et al. Epinephrine in digital block: color Doppler flow imaging. *Dermatol Surg* 2004;**30**(4 Pt 1):508–11.

Krunick AL, Wang LC, Soltani K, et al. Digital anesthesia with epinephrine: an old myth revisited. *J Am Acad Dermatol* 2004;**51**:755–9.

Andrades PR, Olguin FA, Calderon W. Digital blocks with or without epinephrine. *Plast Reconstr Surg* 2003;**111**:1769–70.

Computed tomography for small bowel obstruction

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Checked by Amin Alyas

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Abstract

A short cut review was carried out to establish whether computed tomography (CT) is useful in the management of patients with suspected acute small bowel obstruction (SBO). A total of 348 papers were found using the reported search and manually cross referencing papers, of which 16 represented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are presented in table 3. The clinical bottom line is that CT is a useful investigation in patients presenting with suspected SBO.

Three part question

In an [adult patient presenting with suspected SBO] is [CT] useful in [the diagnosis of obstruction and strangulation].

Table 3

Author, date, country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Ha <i>et al</i> , 1997, South Korea	84 patients with previous laparotomy presenting with small bowel obstruction (SBO) (41 strangulated) undergoing computed tomography (CT) (intravenous (iv) contrast). Malignant/inflammatory obstruction excluded	Case series	CT diagnosis of strangulation	Sensitivity 85%	Retrospective case series
Suri <i>et al</i> , 1999, India	32 patients with suspected SBO undergoing CT	Cohort study	CT diagnosis of, level of and cause of SBO	Diagnosis: sensitivity 93%, specificity 100%, accuracy 94%. Level: sensitivity 93%. Cause: sensitivity 70%	Small numbers
Beall <i>et al</i> , 2002, USA	44 patients with suspected bowel obstruction (28 obstructed) undergoing CT	Cohort study	CT diagnosis of SBO	Accuracy 71%, sensitivity 71%; specificity 71%; positive predictive value (PPV) 83% (n=21)	Small numbers
Lazarus <i>et al</i> , 2004, USA	34 patients with CT findings of small bowel obstruction	Prospective	Presence of small bowel faeces sign (SBFS). Severity of obstruction. Localisation of obstruction.	SBFS present in 55.9%. Present in 16.6% patients with mild obstruction, 72.7% patients with moderate obstruction and 58.8% patients with high grade obstruction. In 94.7% with SBFS level of obstruction found	Small numbers
Scaglione <i>et al</i> , 2004, Italy	120 cases of closed loop SBO who had undergone laparotomy within 6 h of CT (iv contrast) and plain abdominal x ray (AXR).	Retrospective analysis	Diagnosis of closed loop SBO and diagnosis of infarction	CT diagnosed closed loop obstruction in 78%. PPV for CT diagnosis of strangulation 100%, negative predictive value (NPV) 73%	Retrospective analysis
Mallo <i>et al</i> , 2005, USA	11 studies reporting on diagnosis of ischaemia in SBO (743 patients). 7 studies reporting on complete/high grade obstruction (408 patients)	Systematic review	Aggregated PPV, NPV, sensitivity and specificity for CT diagnosis of obstruction and infarction	For bowel ischaemia: PPV 79%, NPV 93%, sensitivity 83%, specificity 92%. For bowel obstruction: PPV 92%, NPV 93%, sensitivity 92%, specificity 94%	

Clinical scenario

A 65-year-old woman presents to the emergency department with signs and symptoms of SBO. She had previously had an abdominal hysterectomy. Plain abdominal radiograph (AXR) is non-specific. You wonder whether abdominal CT would be useful in the management of a patient with presumptive SBO.

Search strategy

Medline 1950 to March 2006 using the OVID interface, combined with manual cross-referencing (exp Intestinal obstruction/AND exp Intestine, Small/AND exp Tomography, X-Ray Computed/) AND ((intestinal adj obstruction) AND CT).mp. limit to (humans and English language).

Search outcome

A total of 491 papers were found of which 16 were relevant to the topic and one systematic review incorporating 11 of these papers (table 3).

Comments

Published literature supports the use of CT as a sensitive and specific test for small bowel obstruction. The evidence supports the proposal that CT provides reliable information regarding cause of the obstruction and presence of bowel strangulation.

► CLINICAL BOTTOM LINE

CT is a useful investigation in patients presenting with suspected SBO.

Beall DP, Fortman BJ, Lawler BC, *et al.* Imaging bowel obstruction: a comparison between fast magnetic resonance imaging and helical computed tomography. *Clin Radiol* 2002;**57**:719–24.

Ha HK, Kim JS, Lee MS, *et al.* Differentiation of simple and strangulated small-bowel obstructions: usefulness of known CT criteria. *Radiology* 1997;**204**:507–12.

Lazarus DE, Slywotsky C, Bennett GL, *et al.* Frequency and relevance of the "small-bowel feces" sign on CT in patients with small-bowel obstruction. *AJR Am J Roentgenol* 2004;**183**:1361–6.

Scaglione M, Grassi R, Pinto A, *et al.* [Positive predictive value and negative predictive value of spiral CT in the diagnosis of closed loop obstruction complicated by intestinal ischemia]. *Radiol Med (Torino)* 2004;**107**:69–77.

Suri S, Gupta S, Sudhakar PJ, *et al.* Comparative evaluation of plain films, ultrasound and CT in the diagnosis of intestinal obstruction. *Acta Radiol* 1999;**40**:422–8.

Mallo RD, Salem L, Lalani T, *et al.* Computed tomography diagnosis of ischemia and complete obstruction in small bowel obstruction: a systematic review. *J Gastrointest Surg* 2005;**9**:690–4.

The effect of warming local anaesthetics on pain of infiltration

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Abstract

A short cut review was carried out to establish whether warming local anaesthetic solutions reduced the pain on injection. A total of 758 papers were found using the reported search, of which 11 represented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are presented in table 4. The clinical bottom line is that warming local anaesthetics, either alone or in combination with buffering, significantly reduces pain of local infiltration.

Three part question

In [patients requiring local anaesthetic infiltration] is [warmed local anaesthetic rather than room temperature local anaesthetic] on infiltration [less painful]?

Clinical scenario

A 40-year-old man sustains a 2 cm laceration to his left forearm. There is no tendon/neurovascular damage. Would warmed local anaesthetic or room temperature local anaesthetic be less painful on infiltrating the wound before suturing?

Search strategy

Medline 1966-12/06 using the OVID interface (limited to Humans and English Language) {[lignocaine.mp. or exp Lidocaine or lidocaine.mp. or exp Lidocaine or bupivacaine.mp. or exp Bupivacaine or prilocaine.mp. or exp Prilocaine or marcaine.mp. or \$caine.mp. or exp Anesthetics, Local or exp Anesthesia, Local or local.mp.] AND [warm.mp. or exp Heat or heat.mp. or hot\$.mp. or temperature\$.mp. or exp Temperature or exp Body Temperature] AND [pain\$.mp. or exp Pain or exp Pain Measurement]}.

Search outcome

A total of 758 papers were found, of which only 11 were relevant (table 4).

Comments

Eight papers were double blinded and three were single blinded. All were randomised trials. All had small sample sizes ranging from 20–45 patients. All studied healthy volunteers, apart from two which studied infiltration of traumatic wounds and infiltration of facial lesions before excision. Six studied subcutaneous infiltration, three studied intradermal infiltration, one studied dental procedures and one studied digital nerve blocks. All studied lignocaine except one which studied bupivacaine. The most relevant paper to wound closure in the emergency department was one that studied pain on infiltrating traumatic wounds. It had the largest sample (45 patients) and concluded that warming reduced pain on infiltration ($p < 0.05$). It was, however, single blinded and did not determine the exact site or size of the wounds. Five more double blinded studies (on healthy volunteers) supported the result that warming reduces pain. Two papers showed that warming and buffering have a synergistic effect in reducing infiltration pain. Another paper, however, concluded that only buffering reduces pain, and that warming a buffered solution does not reduce the pain any further. Only one paper included children. It, however, looked at pain of local anaesthetic injections in dental procedures, and a topical local anaesthetic was used before injections. It concluded that warming did not reduce the pain of infiltration.

Warming the local anaesthetic using commercially available warmers is a simple, inexpensive, and practical way of reducing the pain of local anaesthetic infiltration in the accident and emergency environment.

► CLINICAL BOTTOM LINE

The overall evidence suggests that warming local anaesthetics, either alone or in combination with buffering, significantly reduces pain of local infiltration.

Bainbridge LC. Comparison of room temperature and body temperature local anaesthetic solutions. *Br J Plast Surg* 1991;**44**:147–8.

Davidson JA, Boom SJ. Warming lignocaine to reduce pain associated with injection. *BMJ* 1992;**305**:617–8.

Mader TJ, Playe SJ, Garb JL. Reducing the pain of local anesthetic infiltration: warming and buffering have a synergistic effect. *Ann Emerg Med* 1994;**23**:550–4.

Waldbillig DK, Quinn JV, Stiell IG, *et al.* Randomized double-blind controlled trial comparing room-temperature and heated lidocaine for digital nerve block. *Ann Emerg Med* 1995;**26**:677–81.

Bartfield JM, Crisafulli KM, Raccio-Robak N, *et al.* The effects of warming and buffering on pain of infiltration of lidocaine. *Acad Emerg Med* 1995;**2**:254–8.