CONNECTIONS & SYNERGY

Sharing Journal Club Summaries Across NZ

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KOTAHITANGA

NETWORKING OUR JOURNAL CLUBS

Welcome back to Kotahitanga. Here we aim to share the collective wisdom from the journal clubs of numerous EDs across New Zealand.

Multiple separate groups of ED experts frequently review cutting edge literature in isolation from one another. Kotahitanga's mission is to share that wisdom and accelerate the dissemination of locally beneficial new ideas in Emergency Medicine. Hopefully this will also reduce unnecessary duplication of work and serve as a forum for local and national discussions.

KOTAHITANGA

Conveys the Value of Unity, Togetherness, Solidarity & Collective Action

GET IN TOUCH

Do you need toxicology advice stat? Call the National Poison Centre on 0800 POISON for expert advice any time of day.

If your ED has a regular journal club and is happy to share its findings, please get in touch. We now publish summaries from Hutt, Hawke's Bay, Taranaki Base, Nelson, Dunedin & Christchurch.

Submissions can be in whatever format suits. Many of our current submissions are via powerpoint slides. Whilst we try to standardise the presented structure, our primary aim is to share the locally formulated conclusions. So please don't be put off if your department does things slightly differently to what is presented here.

We are also aware that the external validity of conclusions drawn locally, might not be universally applicable. To help mitigate this factor, each summary will be clearly labelled to show where it was reviewed. This allows you to make your own conclusions regarding a summary's relevance to your department.

The name for this newsletter was chosen with the help of our local Maori Health Service Team and aims to echo the ideas of unity, collaboration and sharing.

Feedback on any of Kotahitanga's content or the general layout is actively encouraged. Please get in touch via our email address; kotahitanga@edhermes.net. For now we will aim to publish monthly. Feel free to redistribute this newsletter to all interested ED staff.

Drop us an email if you would like to go directly onto our mailing list.

Thank you for your time. Noho ora mai.

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Involved Departments:

- Christchurch
- Dunedin
- Nelson
- Taranaki Base
- Hawke's Bay
- Hutt

Editor: Owain Wright

mini-JC
August 2020 - Christchurch
C. Bell

Demystifying Lactate in the Emergency Department .

Wardi G et al.

Ann Emerg Med doi: 10.1016/j.annemergmed.2019.06.027. Epub 2019 Aug 29

Primary Question

This paper seeks to shed light on the topic with a brief description of the physiology of lactate, a short segment of myth busting and then finishes with an overview of lactates application in the emergency department.

Relevance to our Practice

- Practice confirming.
- Academic interest

Take Home Message

Use in the ED:

- Functions as a marker of resuscitation,
- Identifies patients w occult hypoperfusion
- Provides prognostic information
- Patients w liver cirrhosis and renal impairment will have higher lactate levels
- Oncology patients often have elevated lactate from tumour cell turnover

BACKGROUND

The role of lactic acid and its conjugate base, lactate, has evolved during the past decade in the care of patients in the emergency department (ED). A recent national sepsis quality measure has led to increased use of serum lactate in the ED, but many causes for hyperlactatemia exist outside of sepsis. We provide a review of the biology of lactate production and metabolism, the many causes of hyperlactatemia, and evidence on its use as a marker in prognosis and resuscitation. Additionally, we review the evolving role of lactate in sepsis care.

Myths busted

- Application of venous tourniquet does not significantly alter venous lactate sample
- Only mild discrepancies between arterial and venous samples.
- Administration of Lactate Ringers solution does not lead to falsely high measured lactate levels

Lactate and sepsis

- Though tissue hypoxia and the resulting anaerobic metabolism does generate lactate this is no longer thought to be the primary source in sepsis
- Production secondary to accelerated glycolysis from adrenergic stress, impaired clearance, medication effects and issue malperfusion.
- Site of production controversial. Majority suspected to be produced in lung tissue, followed by skeletal muscle.

Lactate and "Cryptic Sepsis"

- Cryptic shock defined as lactate >4, signs of infection without hypotension
- Initially thought to have higher mortality
- Once therapies protocolised, same mortality as overt hypotension.

Toxins and Medications:

- Elevated lactate in paracetamol overdose portends a poor prognosis
- High lactate if concurrent B2 agonist due to accelerated aerobic glycolysis
- Lactate >10 in carbon monoxide poisoning concerning for concomitant cyanide poisoning
- Lactate likely to be elevated with alcohol ingestion. More marked if co morbid liver or renal disease

Prognostic Value

- In the setting of infection Lactate > 4 associated with a 28% in hospital mortality rate
- Increasing lactate despite therapies associated with poor outcomes

mini-JC

August 2020 - Nelson

A. Munro & H. Johnstone

Association of Checklist Use in Endotracheal Intubation With Clinically Important Outcomes.

Turner JS et al.

JAMA Network Open. 2020;3(7):e209278. doi:10.1001/jamanetworkopen.2020.9278

Primary Question

It is assessing whether current evidence supports use of airway checklists to improve clinical outcomes in pts undergoing endotracheal intubations

Relevance to our Practice

- Check lists are aimed at harm prevention but may do more toward alleviation of cognitive overload at times of intense activity during critical ED procedures.

Take Home Message

Checklists have a place but the actual utility may be better understood as relieving clinical cognitive load.

Other Pertinent Comments

Time to successful intubation was not pooled due to large differences between the studies.

1 study – decreased time from paralysis to intubation with check list use.

1 study – no difference in time from induction to intubation.

1 study – increase in time from decision to intubate to successful intubation with a checklist

BACKGROUND

The use of checklists for various important procedures is considered part of a culture of safety in the hospital. The effect of checklists on actual patient safety is less clear than one might think.

METHODS

11 studies were found when searching for studies published from 1960-2019. There was a mixture of RCTs and observational studies. They needed to have checklist use in a comparator group for ETT intubation and measured at least one of the outcomes. Primary outcome – mortality. Secondary outcome s– first-pass success, oesophageal intubation, hypoxia, hypotension, cardiac arrest. Checklist characteristics – preoxygenation + medication assessments. Otherwise components of studies were inconsistent.

RESULTS

No association between survival and checklist use in patients undergoing ETI in this systematic review and meta-analysis. Checklist use was associated with a decrease in hypoxic events (mild hypoxia only (<90%)) but no other secondary outcomes, although point estimates favoured checklist use. Analyses of studies with low risk of bias found no association with decreased hypoxia, and point estimates did not suggest benefit. Subgroup analyses suggested that checklist use may be more likely to be associated with decreased adverse events in paediatric settings and EDs compared with adult and ICU settings. In the ED studies checklist use reduced hypoxia and oesophageal intubation.

CONCLUSIONS

Despite being unable to prove benefit, the review also demonstrated no proven harm. Could be associated with decreased rate of rare catastrophic events but the studies are not large enough to show this. It is possible that academic centres, where studies are more likely to be performed, are already high performing, and checklist implementation would be more valuable in other settings.

mini-JC

October 2019 - Hawke's Bay

S. Harger

Acetaminophen or Nonsteroidal Anti-Inflammatory Drugs in Acute Musculoskeletal Trauma: A Multicenter, Double-Blind, Randomized, Clinical Trial.

Ridderikhof ML et al.

Ann Emerg Med 2018 Mar;71(3):357-368.e8

Primary Question

Multicentre double blind non-inferiority RCT looking at the analgesic effect (measured by visual pain score) of paracetamol vs diclofenac vs combination of the two in minor musculoskeletal injury (fractures, dislocations and penetrating injuries/ lacerations were excluded)

Relevance to our Practice

- Confirms current practice.

Results

Paracetamol alone was non-inferior to the other groups. There were no serious outcomes.

Quality

Well conducted study with well-matched groups. Note that of over 6000 patients assessed, only 597 were included – a slightly limited group than one might expect from the title.

Group Thoughts

Interesting study, premise was that there was a significant potential harm from non-steroidals at a population scale. It is helpful to know that paracetamol appears non-inferior to NSAIDs in this group, however it was noted that this was quite a limited group. Having ruled out fractures, dislocations and anyone with a small laceration/wound it limits the number we see in ED and is essentially patients with a bruise. But it is nice to know that I can give them paracetamol with a clear conscience.

METHODS

The Paracetamol or NSAIDs in Acute Musculoskeletal Trauma Study was a double-blind, randomized, clinical trial conducted in 2 general practices and 2 emergency departments in the Netherlands. A total of 547 adults, aged 18 years and older, with acute blunt minor musculoskeletal extremity trauma were randomly assigned in a 1:1:1 ratio to acetaminophen 4,000 mg/ day, diclofenac 150 mg/day, or acetaminophen 4,000 mg/ day+diclofenac 150 mg/day during 3 consecutive days. Patients, health care staff, and outcome assessors were blinded for treatment allocation. Follow-up for each patient was 30 days. Primary outcome measures were between-group differences in mean numeric rating scale (NRS) pain scores in rest and with movement at 90 minutes after initial drug administration compared with baseline pain scores with a predefined non-inferiority margin of 0.75 NRS points. Secondary outcomes included NRS pain scores during 3 consecutive days and need for additional analgesia.

RESULTS

One hundred eighty-two patients were treated with acetaminophen, 183 with diclofenac, and 182 with combination treatment. Intention-to-treat analysis revealed mean NRS reduction in rest -1.23 (95% confidence interval [CI] -1.50 to -0.95) and -1.72 (95% CI -2.01 to -1.44) with movement, both for acetaminophen at 90 minutes compared with baseline. Pairwise comparison in rest with diclofenac showed a difference of -0.027 (97.5% CI -0.45 to 0.39) and -0.052 (97.5% CI -0.46 to 0.36) for combination treatment. With movement, these numbers were -0.20 (97.5% CI -0.64 to 0.23) and -0.39 (97.5% CI -0.80 to 0.018), respectively. All differences were well below the predefined non-inferiority margin.

mini-JC

Sept 2020 - Dunedin

S. Beck

Compression Therapy to Prevent Recurrent Cellulitis of the Leg.

Webb E et al.

The New England Journal of Medicine 383;7 nejm.org

August 13, 2020.

Primary Question

Does compression therapy reduce the recurrence of cellulitis?

Relevance to our Practice

- Confirms current practice.
- Academic Interest

Take Home Message

Small, single-centre, non-blinded trial of 84 patients. However, showed statistically significant data that compression therapy reduced incidence of cellulitis recurrence in patients with chronic oedema compared to conservative. 40% recurrence in control group vs 15% recurrence in compression group. Also showed reduction in hospital admissions (14% vs 7%) but insufficient data.

Other Pertinent Comments

Compression is particularly useful to those with chronic leg oedema, recurrent episodes of cellulitis or BMI >33, for which antibiotic prophylaxis is unlikely to benefit. Reduced medium leg volume by -241mls after 15months. Compression is also the primary treatment for lipodermatosclerosis (often misdiagnosed as cellulitis + antibiotics ineffective).

OBJECTIVE

Chronic edema of the leg is a risk factor for cellulitis. Daily use of compression garments on the leg has been recommended to prevent the recurrence of cellulitis, but there is limited evidence from trials regarding its effectiveness.

METHODS

In this single-centre, randomized, non-blinded trial, we assigned participants with chronic edema of the leg and recurrent cellulitis, in a 1:1 ratio, to receive leg compression therapy plus education on cellulitis prevention (compression group) or education alone (control group). Follow-up occurred every 6 months for up to 3 years or until 45 episodes of cellulitis had occurred in the trial. The primary outcome was the recurrence of cellulitis. Participants in the control group who had an episode of cellulitis crossed over to the compression group. Secondary outcomes included cellulitis-related hospital admission and quality-of-life assessments.

RESULTS

A total of 183 patients were screened, and 84 were enrolled; 41 participants were assigned to the compression group, and 43 to the control group. At the time of a planned interim analysis, when 23 episodes of cellulitis had occurred, 6 participants (15%) in the compression group and 17 (40%) in the control group had had an episode of cellulitis (hazard ratio, 0.23; 95% confidence interval [CI], 0.09 to 0.59; P=0.002; relative risk [post hoc analysis], 0.37; 95% CI, 0.16 to 0.84; P=0.02), and the trial was stopped for efficacy. A total of 3 participants (7%) in the compression group and 6 (14%) in the control group were hospitalized for cellulitis (hazard ratio, 0.38; 95% CI, 0.09 to 1.59). Most quality-of-life outcomes did not differ between the two groups. No adverse events occurred during the trial.

CONCLUSIONS

In this small, single-centre, non-blinded trial involving patients with chronic edema of the leg and cellulitis, compression therapy resulted in a lower incidence of recurrence of cellulitis than conservative treatment. (Funded by Calvary Public Hospital Bruce; Australian and New Zealand Clinical Trials Registry number, ACTRN12617000412336.)

mini-JC

2019 - Nelson

A. Munro

A comparison of the effects of etomidate and midazolam as induction agents on hospital length of stay in patients with suspected sepsis: a prospective, randomised study.

Tekwani Karis et al.

Annals of EM 56(5) 2010 (doi:10.1016/j.annemergmed.2010.05.034)

Primary Question

Determine differences in hospital length of stay for patients with suspected sepsis who received either etomidate or midazolam.

Relevance to our Practice

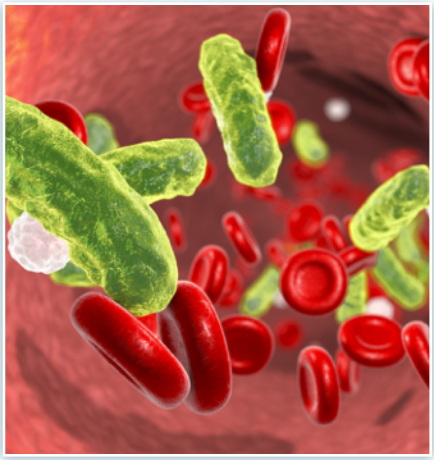
- It may be ok to use etomidate as an induction agent in septic patients, however a larger randomised study with death rate as the primary outcome is required to confirm this.

Take Home Message

Etomidate as an induction agent in septic patients was not associated with increased hospital length of stay (HLOS). However there was a non-significant overall 7% higher mortality in the etomidate group.

Other Pertinent Comments

Single small study showing no patient centred harm. Convenience sample dependent on availability of study investigator/co-ordinator or ED pharmacist. 26 patients were determined not to ultimately have sepsis as the primary cause for illness. Not controlled for steroid administration. Secondary outcomes for ICU LOS were no different. There were more deaths in the etomidate group, but the study was underpowered to determine if this statistically significant. For example further 80 randomised patients would have been needed to detect a 5% mortality difference (p=0.95).



BACKGROUND

Etomidate as an induction agent, has the desirable attributes of rapid onset hypnotic effect and haemodynamic stability.

However it is known to cause a dose dependant blockade of 11-beta-hydroxlase conversion of cholesterol to cortisol that can last from 30 minutes post dose to longer than 24 hours following a single bolus. This makes the use of etomidate in the setting of sepsis controversial.

METHODS

A single tertiary hospital setting prospective double blinded randomised trial of intubated critically ill patients suspected of sepsis. Patients randomised to midazolam or etomidate in volume equivalent doses prepared remotely, numbered and placed in automated dispensing cabinet. Powered to show a 3 day difference in HLOS.

RESULTS

303 potentially eligible during study period; convenience sample of 122 enrolled, 63 got etomidate and 59 midazolam. The etomidate group mean HLOS was not statistically different to the midazolam group.

CONCLUSION

Etomidate may be safe to use as an induction agent in septic patients, larger studies are required to determine if the mortality difference favouring the midazolam group in this study was a significant secondary outcome.

mini-JC

Sept 2020 - Dunedin

S. Beck

Test characteristics of point-of-care ultrasound for the diagnosis of retinal detachment in the Emergency Department.

Kim DJ et al.

Academic Emergency Medicine (2019; 26; 16-22).

Primary Question

To estimate the test characteristics of POCUS for the diagnosis of RD when performed by a heterogeneous group of emergency physicians with varying degrees of ultrasound experience using longitudinal specialist follow-up as the reference standard.

Relevance to our Practice

- Confirms current practice.

Take Home Message

POCUS demonstrates high specificity but only intermediate sensitivity for detection of retinal detachment when performed by a mixed group of ED physicians with minimal teaching/experience in ocular POCUS. If an ED physician suspects RD due to the presentation of new onset of flashes or floaters, the patient should be urgently referred to ophthalmology for review irrespective of a negative POCUS in ED.

Other Pertinent Comments

The ED physicians participating in the study had a wide range of skills/experience in POCUS, the minimum training required was completion of a 1 hr lecture in ocular POCUS for RD; thus, the study does not suggest that ocular POCUS is a poor diagnostic tool overall, rather it highlights that in unskilled hands the sensitivity may be inadequate. The study did not review the POCUS images recorded by each participating ED physician, so it is difficult to analyse the underlying reasons for the poor sensitivity. This is an area that could be addressed in future studies.

BACKGROUND

Previous studies of point-of-care ultrasound (POCUS) have reported high sensitivities and specificities for retinal detachment (RD). Our primary objective was to assess the test characteristics of POCUS performed by a large heterogeneous group of emergency physicians (EPs) for the diagnosis of RD.

METHODS

This was a prospective diagnostic test assessment of POCUS performed by EPs with varying ultrasound experience on a convenience sample of emergency department (ED) patients presenting with flashes or floaters in one or both eyes. After standard ED assessment, EPs performed an ocular POCUS scan targeted to detect the presence or absence of RD. After completing their ED visit, all patients were assessed by a retina specialist who was blinded to the results of the POCUS scan. We calculated sensitivity and specificity with associated exact binomial confidence intervals (CIs) using the retina specialist's final diagnosis as the reference standard.

RESULTS

A total of 30 EPs enrolled 115 patients, with median age of 60 years and 64% female. The retina specialist diagnosed RD in 16 (14%) cases. The sensitivity and specificity of POCUS for detecting RD were 75% (95% CI = 48%–93%) and 94% (95% CI = 87%–98%), respectively. The positive likelihood ratio was 12.4 (95% CI = 5.4–28.3), and negative likelihood ratio was 0.27 (95% CI = 0.11–0.62).

CONCLUSIONS

A large heterogeneous group of EPs can perform POCUS with high specificity but only intermediate sensitivity for RD. A negative POCUS scan in the ED performed by a heterogeneous group of providers after a 1- hour POCUS didactic is not sufficiently sensitive to rule out RD in a patient with new-onset flashes or floaters.

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Consent is obtained in all cases of patient information discussion.

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