2023 ANZCA ASM Prize session abstract examples

Low-level versus high-level disinfection of ultrasound transducers after standardised contamination on skin: a non-inferiority randomised controlled trial. ULTIMO

Dr Nathan Peters [1,2,3], Dr Frances Williamson [1,2], Ms Michelle Bauer [4], Dr Peter Snelling [2,5,6], Prof Nicole Marsh [6,7], Ms Stacey Llewellyn [8], Dr Adam Stewart [4,9], Dr Patrick Harris [4,9], Prof Claire Richard [2,6,7]

[1] Royal Brisbane And Women's Hospital, Brisbane, Queensland, Australia, [2] University of Queensland, Brisbane, Queensland, Australia, [3] University of Melbourne, Victoria, Australia, [4] UQ Centre for Clinical Research, Brisbane, Queensland, Australia, [5] Gold Coast University Hospital, Gold Coast, Queensland, Australia, [6] Griffith University, Queensland, Australia, [7] MetroNorth Hospitals and Health Service, Brisbane, Queensland, Australia, [8] Statistics Unit, QIMR Berghofer Medical Research Institute, Brisbane, Queensland, Australia, [9] Pathology Queensland, Brisbane, Queensland, Australia

Ultrasound (US) improves the success and safety of needle guided percutaneous procedures. Consensus is lacking as to whether high- or low-level disinfection (HLD or LLD) is required before reusing these US transducers on subsequent patients.[1,2,3] HLD is effective across a broader microbial spectrum but requires additional staff time and organisational resources potentially impacting US availability and patient care.[2] We aimed to compare LLD to HLD in the elimination of skin microorganisms from contaminated US transducers.

Methods

A randomised non-inferiority trial conducted at a large metropolitan hospital in 2022 (HREC/2021/QRBW/77718 and ACTRN12622000296730). Two identical US transducers were used (Sonosite® HFL38x/13-6MHz) with one only reprocessed with LLD (Clinell Universal Wipes® $0.1AUD/cycle) and the other HLD (Tristel Trio Wipes® $15.40AUD/cycle). Participants (patients and healthcare staff) were block randomised determining which transducer was applied to their left or right forearms with sterile US gel. Using sterile cotton tip swabs samples were taken from both transducers before and after reprocessing. Swabs were plated by a blinded microbiologist and colony forming units (CFU) counted and identified after 4-5 days incubation. Statistical analysis used the Nam Score non-inferiority test with the null hypothesis being that the difference in the proportion of US transducers with absent CFUs (CFU=0) following disinfection between LLD and HLD is less than or equal to -0.05 (LLD – HLD).

Results

Of the 633 recruited participants 73% (n=463) had confirmed microbial growth from both left and right arm transducers and were included in the preliminary statistical analysis. Participants with no microbial growth before reprocessing on one transducer 13% (n=80) or both transducers 14% (n=90) were excluded. An absence of CFUs after disinfection was seen in 100% of swabs from the HLD transducer (n=463) (95% CI: 99.2%-100.0%) and 99.1% from the LLD transducer (n=459) (95% CI 97.8-99.7%). The

paired difference in the proportion of absent CFUs between LLD and HLD was -0.009 (95% CI: -0.022 - -0.0003, p-value<0.001), meaning LLD was non-inferior to HLD at the 2.5% significance level.

Discussion

Reprocessing with LLD is non-inferior to HLD when US transducers are contaminated by microorganisms found on skin. It therefore follows that the infectious risk to patients when LLD is used is no higher than HLD challenging current guidelines recommending HLD for US guided percutaneous procedures. These results will also ensure patients, clinicians, and organisations can continue to benefit from easy access to US while also avoiding the costs of higher levels of disinfection than required.

Acknowledgements

Australasian Society for Ultrasound in Medicine research grant funding.

Authors have no conflicts relating to this study.

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ANZCA ASM 2023 5-9 May, Sydney

The effect of type of anaesthetic on delirium after surgery for acute hip fracture: an instrumental variable analysis

Dr Anna Tanios[1,2], Dr Emily Gallagher[1,2], Dr Sean McManus[1], Dr Emily Ahern[1], Dr John Riordan[1], Prof Ian Harris[2], Dr Lara Harvey[2]

[1]Mater Health Services, Brisbane, QLD, Australia, [2]Neuroscience Research Australia (NeuRA), Sydney, NSW, Australia

Hip fractures are a significant complication of falls in older adults, with most patients requiring surgical intervention. Although the majority of Australian and New Zealand hip fracture patients undergo a general anaesthetic (GA) for their procedure, spinal and regional anaesthetic techniques are frequently utilised [1]. In 2020, 24% of both Australian and New Zealand patients experienced delirium during their acute hip fracture admission [1]. Delirium can have devastating consequences for older adults including increased length of hospital stay, functional and cognitive decline and increased mortality [2]. Current evidence is yet to demonstrate a consistent link between the type of anaesthetic and the rates of delirium in the setting of acute hip fracture surgery [3]. The aim of this study is to assess the causal effect of anaesthetic type on the incidence of delirium for patients undergoing acute hip fracture surgery.

Methods

Using the Australian and New Zealand Hip Fracture Registry (ANZHFR) database, we conducted a retrospective cohort study of patients aged 50 years old and over who underwent acute hip fracture surgery in Australian and New Zealand Hospitals between 2015 and 2020 and were assessed for delirium. Descriptive statistics were used to determine the incidence of acute in-hospital delirium in patients who received GA versus those who did not. Multivariable multi-level logistic regression was used to test association between type of anaesthesia and delirium controlling for known confounders including age, sex, ASA, type of surgery, pre-fracture residential aged care and cognition. Finally, given hospital variation in preference for anaesthetic type, an instrumental variable (IV) analysis was performed to minimise the effect of unknown confounders.

Results

Of the 35,252 patients, 25,682 (72.9%) patients either received a GA alone or a GA combined with a regional anaesthetic (RA) technique, and 9,570 (27.2%) patients did not receive a GA for their hip fracture surgery. A higher proportion of patients who received a GA developed delirium than those who did not have a GA (10,429 (40.6%) vs. 3,412 (35.7%)). There was no difference in sex, age or 30-day mortality between groups. After adjusting for known confounders, patients who underwent a GA were at 14% increased odds of developing delirium compared to those who did not (OR 1.14, 95% CI 1.04-1.25, p=0.0052). However, the IV analysis found no difference between groups (OR 1.03, 95% CI 0.99-1.07, p=0.141).

Discussion

Whilst there is an association between undergoing general anaesthesia for acute hip fracture surgery and developing delirium post-operatively, an instrumental variable analysis to compensate for unmeasured confounding showed no casual association between the use of GA and post-operative delirium. Further study is needed to evaluate the contribution of regional anaesthesia to these rates.

Acknowledgements Nil conflicts of interest declared.

Ethics Approval HC220406

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