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The PReLiMinAry (Pain Relief in Major Amputation) Survey

Original paper

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1 **The PReLiMinAry (Pain Relief in Major Amputation) Survey**

3 **Abstract**

4 **Objectives**

5 Major Lower Limb Amputation (MLLA) is associated with significant peri- and post-
6 operative pain and has been identified as a research priority by patient and healthcare
7 groups. The PReLiMinAry survey was designed to evaluate existing MLLA analgesia
8 strategies; identifying areas of equipoise and informing future research.

10 **Methods**

11 A targeted multi-national, multi-disciplinary survey was conducted via SurveyMonkey®
12 (5/10/2020-03/11/2020) and advertised via social media and society email lists. The 10-
13 questions explored ‘pain-team’ services, pre-operative neuroleptic medication, pre-
14 incision peripheral nerve blocks and catheters, surgically placed nerve catheters, post-
15 operative adjunctive regimens, future research engagement and equipoise.

17 **Results**

18 76 responses were received from 60 hospitals worldwide. Twelve hospitals(20%) had a
19 dedicated MLLA pain team, seven(12%) had none. Most pain teams(n=52; 87%) assessed
20 pain with a 0-10 numerical rating scale. Over half of respondents “never” preloaded
21 patients with oral neuroleptic agents(n= 42/76; 55%).

22 Forty-seven hospitals(78%) utilised patient controlled opioid analgesia. Most hospitals
23 are able to provide pre-incision loco-regional peripheral nerve blocks, nerve catheters and

24 surgical nerve catheters (95%, 77%, and 90% respectively), but use was variable.
25 Ultrasound(US) guided peripheral nerve catheters were “infrequently” or “never” used in
26 57% of hospitals, whilst 23% “infrequently” or “never” utilise surgically placed nerve
27 catheters.

28

29 **Conclusions**

30 The survey revealed a preference towards ‘single-shot’ nerve blocks and surgical
31 catheters. A difference between the use of US guided nerve catheters and those surgically
32 placed likely reflects the difference of literature evaluating these techniques. Most
33 respondents felt there was equipoise surrounding future trials evaluating nerve
34 blocks/catheters, but less so for surgical catheters.

35

36 **1. Introduction**

37 Major Lower Limb Amputation (MLLA) is associated with significant peri- and post-
38 operative pain and The Vascular Society^[1] and Vascular Anaesthesia Society of Great
39 Britain and Ireland identified this as a research priority after patient and healthcare
40 professional prioritisation exercises.^[2] 10,022 MLLA were performed in UK NHS
41 hospitals, in the three year period between 2017 and 2019, according to the National
42 Vascular Registry.^[3] The PReliMinAry survey was designed to evaluate existing
43 strategies regarding peri- and post-operative MLLA analgesia, and identify areas of
44 equipoise and uncertainty, thereby informing future research.

45 **2. Materials and methods**

46 A targeted multi-national, multi-disciplinary survey of peri-operative MLLA analgesia
47 care was designed by a multi-professional group, and conducted via SurveyMonkey®
48 (5/10/2020-03/11/2020) and advertised via social media and society email lists. Any
49 medical professional involved in the MLLA pathway could partake in the survey. Ethical
50 approval was not required for this study. Where multiple answers were received from the
51 same institutions, data from the most senior person responding was analysed. The 10-
52 question survey explored current pain practice around MLLA including ‘pain-team’
53 services, pre-operative neuroleptic medication, pre-incision peripheral nerve blocks and
54 catheters, surgically placed nerve catheters, post-operative adjunctive regimens, future
55 research engagement and equipoise.

56 **3. Results**

57 76 responses were received from 60 hospitals worldwide, (54 UK, 13 Europe, 5 USA, 2
58 Australasia and 2 Asia). The majority of respondents were medical (63 surgical and 8

59 anaesthetic) including 40 Consultants/Attendings, 27 registrars/residents and 4 fellows.
60 The remaining responses were from physiotherapists (2), nurse practitioners (2) and 1
61 tissue viability nurse. 9 centres submitted duplicate responses; for 6 of these centres the
62 answers were counted from Consultants, the remaining 3 from registrars/fellows. Where
63 duplicate responses were received, the answers from the most senior respondent were
64 utilised.

65

66 Twelve hospitals (20%) had a dedicated MLLA pain team, seven (12%) had none, and
67 the remainder (n=41; 68%) had a 'generic' pain team who reviewed MLLA patients post-
68 operatively. Most pain teams (n=52; 87%) assessed pain with a 0-10 numerical rating
69 scale. Oral neuroleptic agent preloading was "never" done by over half respondents (n=
70 42/76; 55%). From the remaining 45% of health practitioners, preloading is variably
71 offered ("infrequently" n=18/76; "sometimes" n=4/76; "often" n=10/76; "always"
72 n=1/76).

73

74 *Table 1 shows the availability and frequency of use of loco-regional analgesia, by*
75 *hospital. (See Table 1)*

76

77 The commonest duration that both ultrasound-guided, and surgical nerve catheters are
78 left in situ was 3 days (n=12 and 17 respectively), followed by 5 days (n=9 and 15
79 respectively). Forty-seven hospitals (78%) utilised patient controlled opioid analgesia:
80 33 as adjuncts to all blocks (neuro-axial and loco-regional), 2 as adjuncts to neuro-axial
81 analgesia only and 12 in addition to nerve catheters (either US guided or surgical).

82

83 Three final questions asked respondents if they would be happy to randomise patients to
84 receive one of the three interventions detailed in Table 1, versus no intervention/placebo.
85 Sixty-five (86%) were willing to randomise patients to pre-incision ultrasound-guided
86 nerve blocks. The most common barrier to randomisation was lack of equipoise (n=9).
87 Sixty-two (82%) were willing to randomise patients to pre-incision ultrasound-guided
88 nerve catheter; a lack of expertise (n=15) was the predominant obstacle, with lack of
89 equipoise also an issue (n=7). Fifty-two (68%) were willing to randomise patients to a
90 surgically-placed nerve catheter, with those unwilling citing that it is already the standard
91 of care (n=16) and due to a lack of equipoise (n=11).

92 ***4. Discussion and Conclusion***

93 The PReLiMinAry survey demonstrates reasonable homogenous management regarding
94 pain assessment, the availability of a ‘pain-team’, pre-operative prescription of
95 neuroleptics, and the use of patient-controlled analgesia peri- and post-MLLA. Peripheral
96 nerve blockade practice however, in all forms, is variable.

97 Most hospitals have the capability to provide pre-incision loco-regional peripheral nerve
98 blocks, nerve catheters and surgical nerve catheters (95%, 77%, and 90% respectively),
99 but these are inconsistently utilised with a preference towards ‘single-shot’ nerve blocks
100 and surgical catheters. Ultrasound-guided peripheral nerve catheters were “infrequently”
101 or “never” used in 57% of hospitals, whilst 23% “infrequently” or “never” utilise
102 surgically placed nerve catheters. It is likely this difference reflects the difference of
103 literature evaluating these two catheter-based techniques, however lack of expertise was
104 the commonest reason reported in the survey. ^[4-6].

105 Most had equipoise for randomising patients into future control trials evaluating nerve
106 blocks/catheters. Fewer of the respondents perceive equipoise with surgically-placed
107 nerve catheters, in part due to it being “already standard of care”, possibly due to
108 comparatively superior evidence.^[5] However, the majority (68%) expressed willingness
109 to randomise their patients in a trial evaluating this intervention, which is likely a
110 reflection of the low-quality of evidence supporting their use.^[6] There are several
111 limitations. Our results are disproportionally representative of UK practice since 90% of
112 hospitals represented are within the UK. This being said, given the comparative lack of
113 evidence to guide practice in a number of areas, it is likely that the variation seen here
114 would apply to other countries. Similarly, far more surgical medical staff responded in
115 comparison to anaesthetic medical staff (63 vs 8), potentially introducing bias. The
116 number of respondents per hospital was relatively low, with the potential for responses to
117 reflect individual bias’. Non-response bias is a limitation true to all surveys, with self-
118 selected respondents. Finally, whilst this survey does provide valuable snap-shot data on
119 current peri-MLLA analgesic practice, our methodology for exploring equipoise within
120 the vascular community remains inferior to a more rigorous approach - such as the Delphi
121 approach.^[7] Future studies should aim to utilise our ‘first-step’ data for this process.

122 Nonetheless, these survey data demonstrate that peri- and post-operative pain
123 management is variable, and that there is broad equipoise in the vascular community for
124 further randomised investigations of pain control, to comprehensively inform future
125 practice.

126 **Declarations**

127 *Declaration of Conflicting Interests*

128 The Authors declare that there are no conflicts of interest

129

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134 **References**

- 135 [1] Smith G E, Long J, Wallace T, Carradice D, Chetter I C, Vascular Research
136 Collaborative, Identifying the research priorities of healthcare professionals in UK
137 vascular surgery: modified Delphi approach, *BJS Open*, 2020;, zraa025, <https://doi.org/10.1093/bjsopen/zraa025>
- 139 [2] Boney O, Bell M, Bell N, Conquest A, Cumbers M, Drake S, et al. Identifying research
140 priorities in anaesthesia and perioperative care: final report of the joint National Institute
141 of Academic Anaesthesia/James Lind Alliance Research Priority Setting Partnership.
142 *BMJ Open*. 2015 Dec 16;5(12):e010006. DOI: 10.1136/bmjopen-2015-010006.
143
- 144 [3] Waton S, Johal A, Birmipili P, Li Q, Cromwell D, Pherwani A, O'Neill R, Boyle J.
145 National Vascular Registry: 2020. Annual report.
- 146 [4] Richman JM, Liu SS, Courpas G, Wong R, Rowlingson AJ, McGready J, et al. Does
147 continuous peripheral nerve block provide superior pain control to opioids? A meta-
148 analysis. *Anesth Analg*. 2006 Jan;102(1):248-57. doi:
149 10.1213/01.ANE.0000181289.09675.7D. PMID: 16368838.
- 150 [5] Laloo R, Ambler GK, Locker D, Twine CP and Bosanquet, DC. Systematic review
151 and meta-analysis of the effect of perineural catheters in major lower limb amputations;
152 *EJVES* (In Press)
- 153 [6] Aladin H, Jennings A, Hodges M and Tameen A. Major lower limb amputation
154 audit - introduction and implementation of a multimodal perioperative pain
155 management guideline. *Br J Pain* 2018;12:230–7. DOI:[10.1177/2049463718769339](https://doi.org/10.1177/2049463718769339)
- 156 [7] de Villiers MR, de Villiers PJ and Kent AP. The Delphi technique in health sciences
157 education research. *Med Teach*. 2005 Nov;27(7):639-43. doi:
158 10.1080/13611260500069947. PMID: 16332558.
- 159
- 160