Poor pain control rather than anaesthetic technique influences outcome in total knee arthroplasty

Editor—The study by Harsten and colleagues1,2 demonstrated that patients having spinal anaesthesia (SA) had worse pain control at 6 h, more opioid consumption, more nausea, vomiting, and dizziness when compared with those having general anaesthesia (GA). All of these findings could be explained by the lack of appropriate pain relief as the spinal anaesthetic wore off. The patients having a GA were given oxycodone intraoperatively, whereas those having SA did not have any i.v. analgesia. The SA group were unsurprisingly in severe pain at 6 h and were probably playing catch up with analgesia for a considerable period of time. This explains the higher number of patient-controlled analgesia doses requested but not administered in the SA group. The poor pain control in the spinal anaesthetic group may have led to patients over-compensating and consuming more opioids when compared with the GA group. Poor pain control and higher opioid use may explain the higher incidence of postoperative nausea and vomiting in the SA group. Inadequate postoperative pain relief results in delayed recovery and poor patient satisfaction.3 This is perhaps why most patients who had SA preferred to have GA in the future.

The length of stay (LOS) was shorter in the GA group (46 h) when compared with the SA group (52 h). This is clearly not clinically significant. The statistics used for calculating the sample size is not very clear and one can only assume that the sample size was calculated on the assumption that the difference in the LOS between the two groups was 24 h. This assumption has led to the underestimation of the sample size required. A number of other outcomes have been studied and corrections have not been made for multiple testing. Nausea, vomiting, and dizziness were assessed at fixed times on days 1 and 2 as opposed to fixed time periods after the end of surgery. There are a number of methodological flaws in this study that make the validity of this study questionable.

Declaration of interest

None declared.

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Anaesthesia for elective total knee arthroplasty

Reply from the authors to Dr Reed

Editor—We thank Dr Reed for his letter on our clinical investigation.1,2 We agree that the administration of i.v. oxycodone to our target-controlled infusion (TCI) anaesthesia group could have influenced the postoperative pain scores. However, administering i.v. opioids towards the end of a TCI anaesthesia is almost to be considered as the modus operandi for TCI anaesthesia due to the fact that remifentanil has a very short-lasting analgesic effect. Hence, this could almost be considered as a part of the TCI technique.

Whether patients with a BMI of 35 or more should have been excluded or not in this study is an interesting and relevant question. By excluding patients with a BMI exceeding 35, one might argue that our sample population does not perfectly reflect the general population undergoing total knee replacement.

It is true that our study was written before the publication of the study by Memtsoudis and colleagues.3 However, as pointed out by an editorial4 in the same issue of Anaesthesiology, the trial by Memtsoudis and colleagues is observational rather than experimental in nature. As such, treatment assignment was non-random, creating the real possibility that the authors’ findings may reflect the confounding effects of differences in patient severity rather than effects attributed to anaesthesia type per se.

Declaration of interest

None declared.

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Choice of anaesthesia for elective total knee arthroplasty

Reply from the authors to Dr Chincholkar

Editor—We thank Dr Chincholkar for his letter on our clinical study.1 2 Using an i.v. opioid towards the end of a target-controlled infusion (TCI) anaesthetic is almost to be considered as the modus operandi of this type of anaesthesia. This is due to the fact that remifentanil has a very short-lasting analgesic effect. Hence, this could almost be considered as a part of the TCI technique. It is possible that this could have influenced the postoperative pain scores. This is more of an academic issue since one could argue that TCI and oxycodone could result in a more favourable recovery profile in a fast-track set-up.

We agree that the difference in length of hospital stay (6 h) may not be clinically significant. However, sample size was obviously adequate since we were able to detect a statistically significant difference between the groups.

Nausea and dizziness was monitored at fixed times twice daily (at 08:00 and again at 14:00 h). However, the number of patients having vomited represents the number of vomiting occasions from the previous measuring point.

In conclusion, our study does not show that general anaesthesia (of any kind) is better than regional anaesthesia for patients undergoing total knee arthroplasty (TKA). Our results should be seen in the light of a modern general anaesthetic technique together with a fast-track set-up for patients undergoing elective TKA and it urges for further large randomized trials.

Declaration of interest

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3 doi:10.1093/bja/aeu074
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‘State-of-the-art general anaesthesia’ compared with ‘standard-of-care spinal anaesthesia’ for unilateral knee arthroplasty: ethics and philosophical considerations

Editor—We read with interest the study by Harsten and colleagues.1 Recovery after total intravenous general anaesthesia or spinal anaesthesia for total knee arthroplasty (TKA): a randomized trial and the accompanying editorial.2 Interestingly, the study’s inclination to entertain qualitative parameters (patient’s preference for anaesthesia technique in the future) along with quantitative outcome measures reflects ‘mixed-methods’ study design,3 an exciting and relatively new methodology appropriate for clinical anaesthesia research. However, although the editorial’s complete new-take on the study, that is, comparative evaluation of the recovery outcome after ‘state-of-the-art’ general anaesthesia (SOTA-GA) vs ‘standard-of-care’ spinal anaesthesia (SOC-SA) in patients undergoing elective TKA, was insightful and broadened the scope of comprehension, it also invoked some ethical issues.

First, not uncommonly in clinical anaesthesiology research, in order to analyse patient outcome responses, one requires to follow both quantitative objective parameters of the anaesthetized patient and the qualitative postoperative subjective patient responses. Therefore, an appropriate ‘mixed-methods’ study design has a tacit relevance in anaesthesia outcome research that justifies study objectives and facilitates valid creation of clinical evidence.3

Secondly, ethically, given that width of the line-of-transition between any SOTA and SOC medical intervention techniques (e.g. spinal/general anaesthesia) may vary as per state of available healthcare infrastructure and the backup governance/policy, in the current clinical anaesthesia practice/research context, irrespective of the technique applied, one must ensure that the patients in receipt of anaesthesia do not get harmed (do-no-harm)4 and/or denied the best available care (principle of justice). Further, in the absence of clarity and/or non-availability of consistent scientific evidence as to whether anaesthesiologist’s skill-set, technical gadgetry advantage, or the type of technical intervention impacts SOC-SOTA turnover,5 a SOTA vs SOC comparative effectiveness research (CER)6 in anaesthesia may have an awkward ethical stance whenever an ‘inter-technique’ analysis (SA vs GA) is undertaken. While one may go for ‘intra-technique’, it may be ethically problematic for ‘inter-technique’ evaluation, particularly when one of the techniques is operator-dependent and has a potential for failure (e.g. SA). In the same regard, probably, an inter-technique ‘SOTA-GA’ vs ‘SOC-SA’ evaluation as undertaken in the study is likely to incur an ethical imbalance wider than is perceived otherwise, an effect with pronounced ramifications for a randomized study.

Collectively, for an authentic outcome analysis research, the IRB investigators have an ethical obligation to closely consider the philosophical gap between two different techniques (SA vs GA) to secure participants’ safety. Also, such a CER study should be accorded appropriate methodology to analyse the outcome.