Spinal anaesthesia versus general anaesthesia during laparoscopic total extraperitoneal repair of inguinal hernia: a systematic review

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INTRODUCTION

Laparoscopic repair of inguinal hernia has been demonstrated to be an efficient alternative for the open approach with improved postoperative pain and quality of life, and shorter time to normal activities.

Total extraperitoneal (TEP) repair is traditionally carried out under general anaesthesia (GA). GA provides complete progressive muscle relaxation which facilitates the laparoscopic TEP repair. However, successful use of spinal anaesthesia (SA) in laparoscopic TEP repair has been reported.

AIM

No meta-analysis has compared outcomes of SA and GA in the context of laparoscopic TEP inguinal hernia repair.

Our aim was to conduct a comprehensive systematic review and meta-analysis of reported outcomes to compare laparoscopic TEP hernia repair under SA and GA.

METHOD

We systematically searched MEDLINE; EMBASE; CINAHL; CENTRA, and bibliographic reference lists. Post-operative pain assessed by visual analogue scale (VAS), individual and overall perioperative morbidity, procedure time and time taken to normal activities were the outcome parameters. Combined overall effect sizes were calculated using fixed-effect or random-effects models.

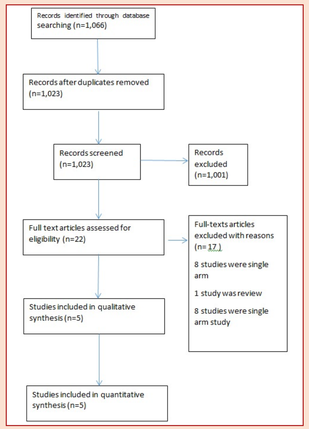


Figure 1. Study Flow diagram

RESULTS

We identified 5 studies including one randomised controlled trial (RCT) and 4 retrospective observational studies. They reported a total of 1,518 patients (2,134 hernia) evaluating outcomes of laparoscopic TEP repair under SA (n=1,277 patients, 1,877 hernia) or GA (n=241 patients, 257 hernia).

SA was associated with significantly lower post-operative pain assessed by VAS at 12 hours (MD: - 0.32, P<0.0001) and shorter time to normal activities (MD: -0.30, P=0.002) compared to GA. However, it significantly increased risk of urinary retention (OR:4.02, P=0.01), hypotension (OR:3.97, P=0.004), headache (OR:7.65, P=0.003), and procedure time (MD: 3.82, P=0.004) There was no significant difference in VAS at 24 hours (MD:0.06, P=0.34), seroma (OR:1.54, P=0.26), wound infection (OR:1.03, P=0.94), and vomiting (OR:0.84, P=0.66) between two groups. There was a non-significant decrease in overall morbidity in favour GA (OR:1.84, P=0.17) which became significant following sensitivity analysis (OR:2.59, P=0.01).

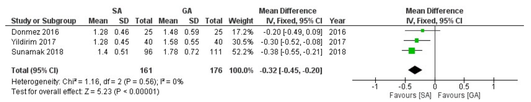


Figure 2. Comparison of postoperative pain assessed by VAS at 12 hours

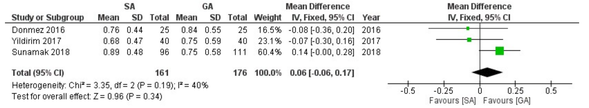


Figure 3. Comparison of postoperative pain assessed by VAS at 24 hours

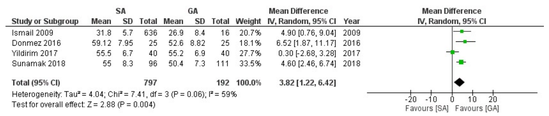


Figure 4. Comparison of procedure time

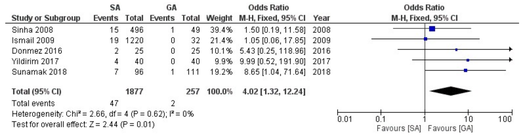


Figure 5. Comparison of urinary retention

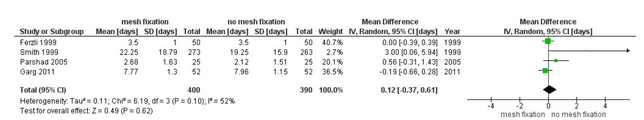


Figure 6. Comparison of seroma

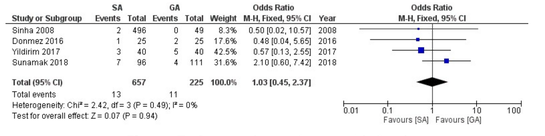


Figure 7. Comparison of wound infection

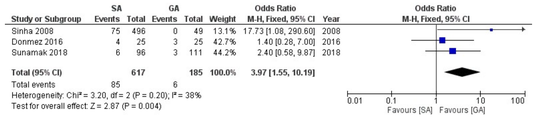


Figure 8. Comparison of hypotension

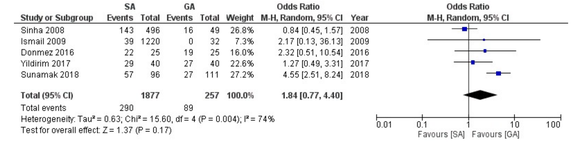


Figure 9. Comparison of overall morbidity

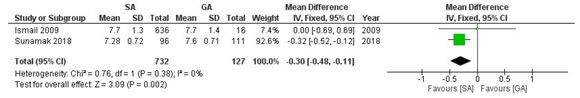


Figure 10. Comparison of time to normal activity

CONCLUSIONS

Our meta-analysis of best available evidence demonstrated that although laparoscopic TEP inguinal hernia repair under SA may reduce pain in early postoperative period, it seems to be associated with increased postoperative morbidity and longer procedure time compared to GA. The limited available evidence from a small number of comparative studies does not provide sufficient data in favour SA to be selected as “the best” anaesthetic choice for TEP repair. Nevertheless, the glass needs to be seen half full. It may be an appropriate anaesthetic modality in selected patients who are considered high risk for GA. Future high quality randomised studies may provide stronger evidence in favour of either approach. We encourage future studies to use the figures provided in this meta-analysis for determining their sample size.

REFERENCES

1. Sinha R, Gurwara AK, Gupta SC. Laparoscopic total extraperitoneal inguinal hernia repair under spinal anesthesia: a study of 480 patients. J Laparoendosc Adv Surg Tech A. 2008;18(5):673–677.
2. Ismail M, Garg P. Laparoscopic inguinal total extraperitoneal hernia repair under spinal anesthesia without mesh fixation in 1,220 hernia repairs. Hernia. 2009;13(2):115–119.
3. Donmez T, Erdem VM, Sunamak O, Erdem DA, Avaroglu HI. Laparoscopic total extraperitoneal repair under spinal anesthesia versus general anesthesia: a randomized prospective study. Ther Clin Risk Manag. 2016;12:1599–1608.
4. Yildirim D, Hut A, Uzman S, Kocakusak A, Demiryas S, Cakir M, Tatar C. Spinal anesthesia is safe in laparoscopic total extraperitoneal inguinal hernia repair. A retrospective clinical trial. Wideochir Inne Tech Maloinwazyjne. 2017 Dec;12(4):417-427
5. Sunamak O, Donmez T, Yildirim D, Hut A, Erdem VM, Erdem DA, Ozata IH, Cakir M, Uzman S. Open mesh and laparoscopic total extraperitoneal inguinal hernia repair under spinal and general anesthesia. Ther Clin Risk Manag. 2018 Oct 1;14:1839-1845.