



Systematic review and meta-analysis of the impact of spinal versus general anesthesia on the variability of surgical times

Alexander Novak, MD; Andrea Taborsky, MD; Franklin Dexter, MD, PhD, FASA; Jennifer L. Espy, BA; Rakesh Sondekoppam, MD

Department of Anesthesia, University of Iowa Hospitals and Clinics, Iowa City, Iowa, USA

Background

- Ongoing debate regarding choice of spinal versus general anesthesia
- Behavior of surgical teams may be influenced by various contributing factors during operative procedure
 - Patients being awake, finite anesthetic duration
- Surgical time ratios are more interpretable than differences of total time when studying many procedures of widely different durations (1)
- We performed a meta-analysis to evaluate systematic differences in the standard deviations of surgical times from single-dose spinal anesthetics (2)
- Ratios of means were compared as secondary endpoint (2)

Materials and Methods

- Literature searches were performed in PubMed, Web of Science, and Scopus databases
- PROSPERO was used to register the systematic review, CRD42023461952
- Randomized clinical trials conducted in human subjects were included when general or spinal anesthesia was used for one category of surgical procedure (e.g. hip replacement) and the article reported the means and standard deviations of operative durations
- Studies were excluded if randomized patients among more than one category of surgical procedure (e.g., “gynecological surgery”) or if included infants

Results

- 1153
- 334 Pubmed
 - 301 Web of Science
 - 518 Scopus
- 593
- 560 duplicates excluded among the 1153 articles
 - Titles and abstracts screened of the 593 articles (e.g., randomized to spinal vs. general anesthesia)
- 228
- 365 excluded from title and abstract screening
 - Full text reviewed of the 228 articles (e.g., for standard deviations of surgical times)
- 78
- 150 excluded from full text review
 - Data extracted from 78 articles for systematic review

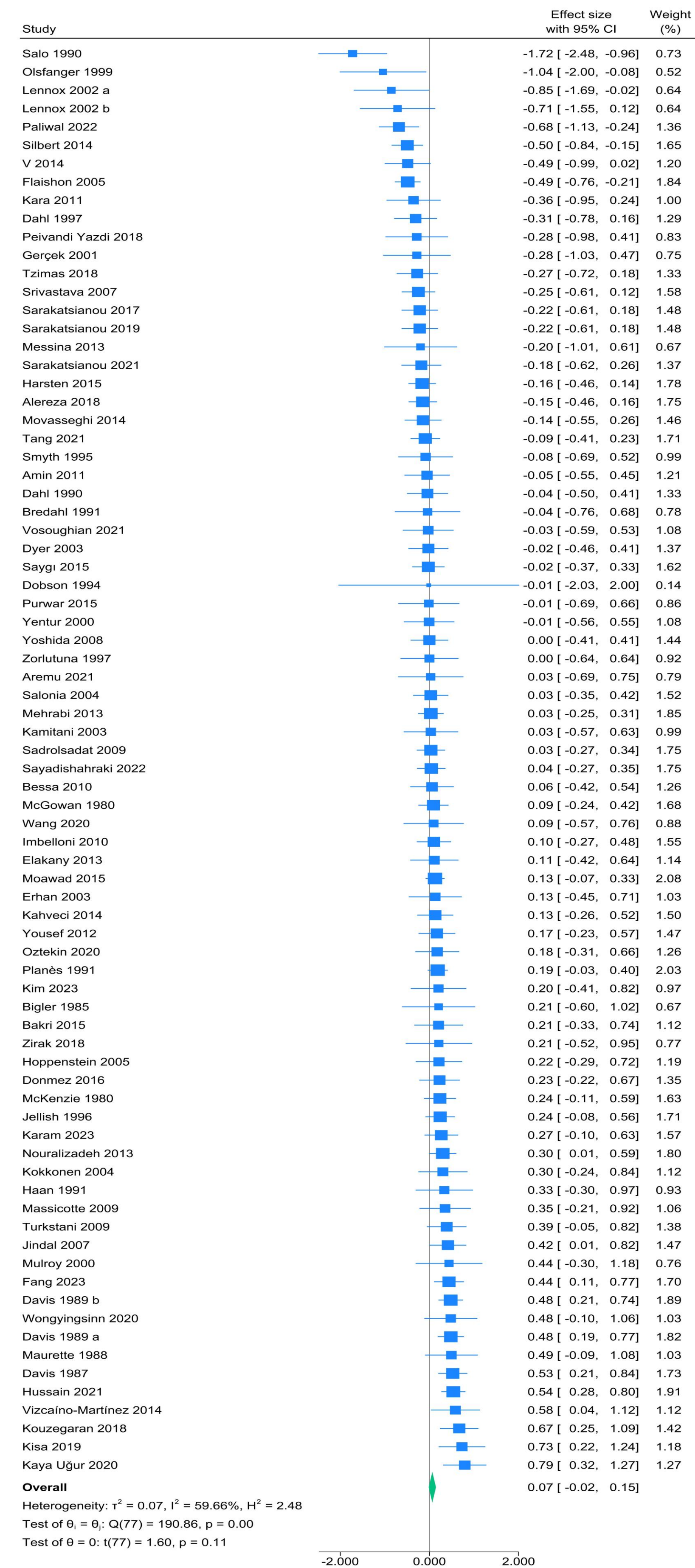


Figure 1. Forest plot for ratios of standard deviations of surgical times, general anesthesia divided by spinal anesthesia. The pooled estimate shows that spinal anesthesia was associated with 6.8% smaller standard deviations than general anesthesia, 95% confidence interval 15.8% smaller to 1.6% larger.

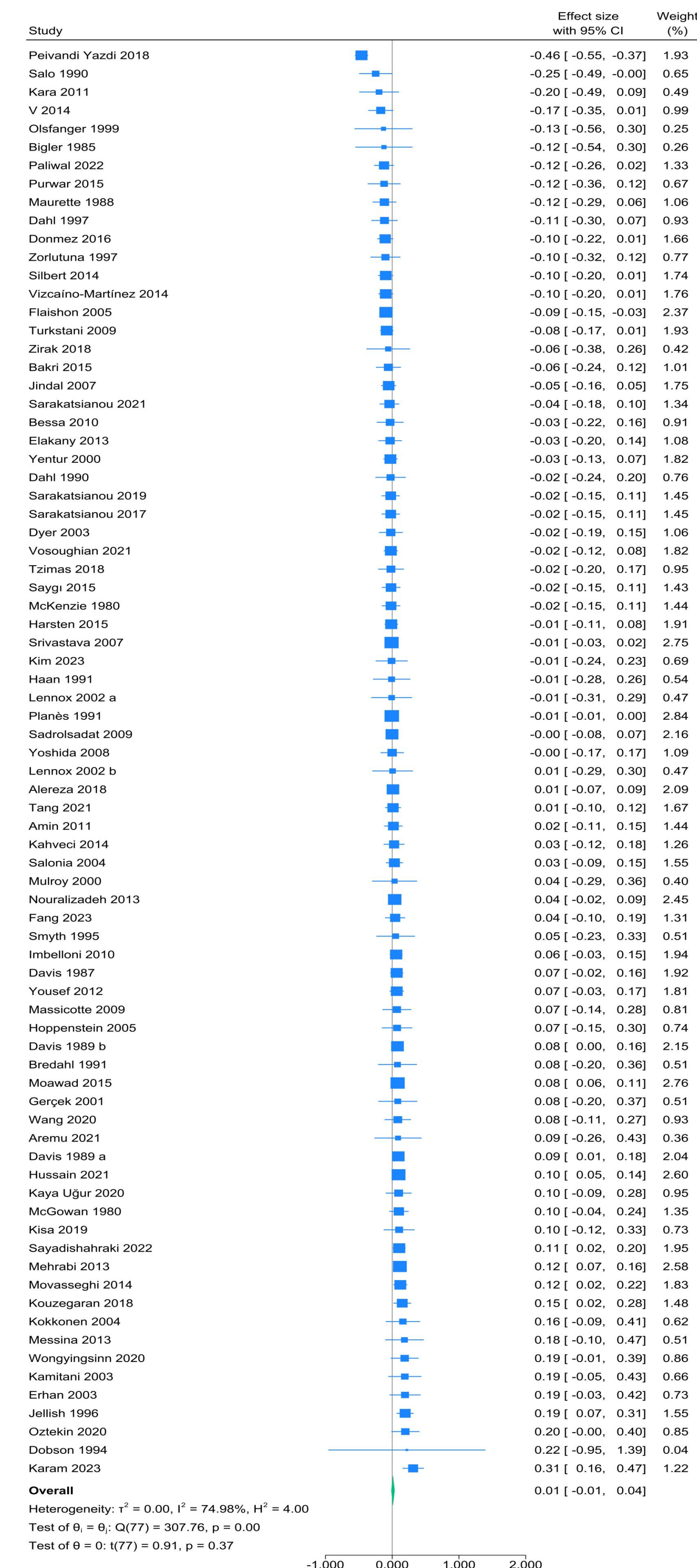


Figure 2. Forest plot for ratios of mean surgical times, general anesthesia divided by spinal anesthesia. The pooled estimate shows that spinal anesthesia was associated with 1.2% smaller standard deviations than general anesthesia, 95% confidence interval 3.8% smaller to 1.4% larger.

Discussion

- We did not detect a significant effect of the use of spinal anesthesia on the variability of surgical times in comparison to general anesthesia
- Although anesthetic choice has clinical (biological) impact and affects anesthesia times, the direct effects on surgical times and workflow are minimal, at most (3)
- Because anesthesiologists have minimal if any systematic effect on how quickly surgeons work, the anesthetic choice does not influence operating theatre productivity via changes to operative times
 - The impact of spinal anesthetic effect would be limited to the non-operative times
 - When spinal blocks are performed ahead in a block room or bay, non-operative times are reduced considerably
- These are examples of anesthesiologists’ roles not only in improving patients’ perioperative outcomes but also to increase healthcare productivity

Conclusion

- Our study shows that the effect of spinal anesthesia on variability, if present, is sufficiently small to have no substantive economic effect
- Our study also shows that the effect of spinal anesthesia does not have a meaningful impact on mean surgical time

References

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