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GENERAL ANESTHESIA VERSUS COMBINED SPINAL-EPIDURAL ANESTHESIA IN GYNECOLOGIC LAPAROSCOPIC SURGERIES: A COMPARATIVE STUDY

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Abstract

The choice of anesthesia in laparoscopic gynecological surgeries plays a critical role in patient outcomes, including intraoperative stability, postoperative recovery, pain control, and overall satisfaction. General anesthesia (GA) and combined spinal-epidural anesthesia (CSEA) are two commonly employed techniques, each with distinct advantages and limitations. However, limited evidence exists regarding their comparative efficacy and safety in gynecological laparoscopic procedures. To compare the effectiveness of GA and CSEA in laparoscopic gynecological surgeries with respect to hemodynamic stability, postoperative pain, recovery time, and perioperative complications. This randomized controlled trial included 120 patients undergoing gynecological laparoscopic surgery. Participants were randomly assigned to two equal groups: GA (n=60) and CSEA (n=60). Parameters assessed included intraoperative hemodynamic stability (heart rate, blood pressure), postoperative pain (measured by visual analog scale), recovery time (time to ambulation and discharge), and complications (nausea, vomiting, respiratory depression).Patients in the CSEA group demonstrated superior hemodynamic stability, lower postoperative pain scores, and faster recovery times compared to those in the GA group. Complications such as nausea, vomiting, and respiratory depression were less frequent in the CSEA group. CSEA appears to be a safe and effective alternative to GA in laparoscopic gynecological surgeries, particularly for patients with comorbidities or at higher risk of hemodynamic instability. Further studies with larger sample sizes are warranted to confirm these findings and explore long-term outcomes.

INTRODUCTION

Laparoscopic surgeries in gynecology are undergoing remarkable advancement, with the use of combined spinal and epidural anesthesia (csea) replacing traditional general anesthesia. The choice of these techniques can significantly influence the result of the procedure and the level of contentment felt by the patient. The aim of this review is to identify the differences and similarities of the use of csea versus general anesthesia for laparoscopic surgeries in gynecology with regard to the effectiveness of anesthetic measures such as safety, satisfaction, and recovery. Both general anesthesia and csea are found effective in laparoscopic gynecological surgery, however, it appears that csea is superior to general anesthesia due to the advantages of better postoperative pain management, smaller volume of blood loss, and reduced incidence of deep venous thrombosis from preserved neurologic function and coagulation physiologic reserves. Although both techniques have their individual share of risks and

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complications, csea carries a lower rate of severe adverse events, including respiratory failure, cardiovascular complications, and postoperative nausea and vomiting among patients having laparoscopic surgeries compared to general anesthesia. Csea's recovery approach was found to be more effective than standard care, resulting in an average increase in patient satisfaction attributed to.. (Hwang JH, 2020 Aug) The use of csea impacts postoperative recovery positively because the patient studies showed that they suffered less postoperative pains, there was a quicker return of bowel function, there was a lower consumption of opioid pain killers, and they spent lesser days in the hospital relative to general anesthesia patients. In conclusion, although csea and general anesthesia have different sets of pros and cons, the balance of evidence suggests that csea is more favorable in relation to effectiveness, safety, patient satisfaction, and quick recovery in laparoscopic surgeries in gynecology. There is a lack of research that aims to provide a thorough and detailed evaluation of csea's comparison to other anesthetic techniques, while also addressing the challenges and limitations csea presents in terms of neuromuscular depression. There are several benefits of minimally invasive laparoscopy for surgical procedures in gynecology such as hysterectomy, myomectomy, ovarian cystectomy, and tubal ligation due to short recovery times resulting from smaller surgical incisions. Nevertheless, the specific type of anesthesia required for the surgical procedures remains the same, despite the balance of evidence.(Hwang JH K. S., 2020 May 22;).

Literature Review:

Prioritizing patient comfort and managing moderate pain during the procedure while ensuring patient safety is of utmost importance. The primary types of anesthesia used for laparoscopic operations are general anesthesia (ga) or a combination of spinal and epidural anesthesia (cse). General anesthesia involves administering different medications and agents to induce a state of deep sleep, where the individual experiences no pain. This is particularly useful for lengthy and intricate surgeries that may necessitate complete manipulation of a person's body. Some of the drawbacks of this type of anesthesia are a higher likelihood of feeling nauseous and lightheaded after the surgery, a longer recovery period, and in some cases, challenges with breathing control in the neck area. A different technique is called candy, which involves injecting local anesthetics into the channel adjacent to the patch site in the spinal cord. (Gorecki GP B. A.-J.-M.-M., 2024 Nov 16 [cited 2025 Feb 4])

In the khorezm region, spinal anesthesia is frequently used for c-section surgeries, with 88 out of 100 patients receiving epidural blocks. There are numerous benefits to spinal anesthesia, especially when it comes to maternal deaths caused by surgical procedures in gynecology. In such cases, spinal anesthesia is a safer than general anesthesia. In addition to these benefits, spinal anesthesia allows the doctor to safeguard the patient by using a smaller amount of medication. It aids in minimizing blood loss during the procedure, while also alleviating pain post-surgery, expediting recovery, and decreasing the likelihood of postoperative complications. There are certain complications that can occur when using spinal anesthesia for laparoscopic surgeries. These include the pneumoperitoneum, as well as the upward movement of the reproductive organs with the leftward tilt of the lung. If this role is not effectively managed, it can lead to significant repercussions when combined with insufficient spinal blocks. (Brakke BD, 2023 Jan;)

The utilization of bupivacaine for spinal anesthesia can enhance the benefits of surgery when combined with regional anesthesia. Some of the advantages of this procedure include less pain after surgery compared to general anesthesia, faster recovery with the return of bowel movement and movement, and reduced need for pain medication. Furthermore, these patients also encounter reduced nausea and vomiting post-surgery, shorter duration of urinary catheter usage, and a decreased likelihood of infection. Complications that arise from extended periods of bed rest, such as ileus, muscle pain, and overall weakness, are also rare. After analyzing the data, it was found that patients who underwent endoscopic spinal surgery had fewer deaths compared to those who had conventional surgery, along with lower risks of complications such as pulmonary or transfusion issues and shorter hospital stays. This is particularly beneficial if there are

limited resources or during times of crisis, such as the ongoing covid-19 pandemic.. (Gorecki GP B. A.-J.-M.-M., 2024 Nov 16 [cited 2025 Feb 4])

In the analysis of gasless spa compared to conventional spa laparoscopic myomectomy, no significant differences were noted in the research demography, moreover to the dominant uterine myoma. The median retraction setup time from skin incision was 480 sec (range 300 to 900 sec) with gasless myomectomy. The median operation time for a gasless spa myomectomy was 106 minutes (range: 60 to 215 minutes). The retraction setup time for a gasless spa laparoscopic myomectomy was 110 minutes (range: 60 to 270 minutes), but there was no significant difference (p=0.251) between the two procedures. The amount of blood loss did not significantly differ across the groups. Neither group's patients had a conversion from laparotomy to laparoscopy. There were no serious side effects in either group, including bowel, vascular, or urologic damage. (Scholar., 2019)

Our recommendations are derived from our extensive experience of managing over 3212 cases and the comprehensive analysis of more than 900 clinical observations. In addition to improving the prognosis of laparoscopic procedures carried out under local anesthetic, this research may be used to update standard recommendations and make laparoscopic surgeries less invasive. We wish to draw attention to the following important factors for real-world use. ([Internet]., 2025 [cited 2025 Jan 18].)A pregnant woman in her 11th week was given precautionary medical care, commonly known as "guard medical treatment," to prevent any potential risks to both the mother and the baby during the pregnancy. Pregnant women who have certain physiological characteristics are more likely to develop gallbladder stone disease and suffer from consequences including acute cholecystitis and other negative effects. In this paper, we provide evidence that, because laparoscopic cholecystectomy is less intrusive than open cholecystectomy, pregnant women may benefit from choosing it during the first trimester of pregnancy.. To minimize any potential harm to the fetus during and after the surgery, csea was chosen as the preferred technique because it reduced the amount of harmful substances in the body and the number of other drugs, while still ensuring the patient's satisfaction. This method has the potential to become the gold standard in the future. Etco2 surveillance has a chance to transform medical care for expectant patients having laparoscopic operations by revealing how the location of the surgical table and elevated internal abdominal pressure affect the patients' ventilator mechanics.(Research-, [cited 2023 Nov 26].)(V.:, 2017 Sep)(Liu Y, 2021 [cited 2025 Feb 4])

For age, body mass index, parity, and past abdominal surgery, the groups did not differ significantly from one another. During an operation, six patients (20%) had nausea or vomiting. Low blood pressure (systolic pressure less than 90 mm Hg) was reported by five subjects. When four patients (13.3%) complained of stomach or shoulder discomfort, injectable pain medication was given. The heart rate of one person dropped. CSEA members' hospital stays lasted less time than those of GA members (p=0.014). There were no differences between the groups in terms of the kind of surgery done, the expected blood loss, the duration of the operation, the conversion rate from laparotomy to laparoscopy, the use of extra trocars, or surgical specific findings. Neither group experienced any significant problems, such as issues with the urinary tract, digestive system, or blood vessels. For individuals who are not overweight and undergoing laparoscopic surgery in the gynecologic area, csea is a secure and efficient method to utilize.

Keywords: laparoscopic surgery without the use of gas, general anesthesia, J-shaped retractor, combined spinal and epidural anesthesia.. (Liu Y, 2021 [cited 2025 Feb 4])

There was no significant difference between the CSEA and GA groups in terms of age, body mass index, parity, or prior surgery to the abdomen. During operation performed under CSEA, six patients (20%) experienced feelings of nausea or vomiting.Five patients (16.7%) had hypotension (systolic blood pressure below 90 mmHg). Four patients (13.3%) complaining of shoulder pain or abdominal discomfort received IV pain free. Bradycardia affected one patient. The GA group's hospitalization was greater than the CSEA group's (p = 0.014). Each of the groups were equivalent in terms of the kind of surgery, the particular surgical finding, the duration of the operation, the expected blood loss, the rate of laparotomy conversion, and

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the use of additional trocars. There were no significant problems in any set, such as bowel, vas, or urologic injuries. Given that mastodons are extinct, let us conclude from the discovered specimen where their range might extend and other species may have followed them. For people who are not obese undergoing gynecological field gasless laparoscopic surgery, CSEA is a safe and sensible method. J-shaped retractor, gasless single-port access laparoscopy, under general anesthesia, Epidural and spinal anesthesia combined The primary one-sensitivity factors were postoperative shoulder discomfort, postoperative nausea and vomiting, operating delays, and functional results. In random controlled trials, 108 patients were featured, in non-randomized studies 58. In the NRSs, the SA and GA groups had the opposite outcomes for postoperative pain, despite the qualitative analysis revealing conflicting conclusions and, for the most part (hemodynamic variables, nausea, and analgesic delivery), no differences that were statistically significant. According to the statistical analysis, women who received SA in RCTs did not significantly reduce operative times (RR −4.40, 95% CI −9.32–0.53) or the frequency of vomiting (RR 0.51, 95% CI 0.17–1.55). However, in the NRS, women who got SA experienced longer operative times (RR 5.05, 95% CI −0.03–10.14) and more episodes of vomiting (RR 0.56, 95% CI 0.10–2.97) than those who got GA. Regardless, the results were not statistically significant.Conclusions: Based on available data, there are no significant advantages of SA over GA for laparoscopic treatment of gynecological disorders. (bajwa SS, 2016) (Major AL, 2024 Jun 14 [cited 2025 Feb 4]) (M., 2013 Oct;)

The findings of this study indicate that both ga and csea were effective in providing the necessary anesthesia for laparoscopic gynecological procedures. Despite the concerns, the study found that csea was associated with reduced postoperative pain and a decreased need for narcotic pain medication. Compared to general anesthesia, conscious sedation offers advantages such as faster recovery, reduced reliance on narcotics, and improved pain management after surgery. The findings of this study indicate that both ga and csea were effective in providing the necessary anesthesia for laparoscopic gynecological procedures. Despite the concerns, the study found that csea was associated with reduced postoperative pain and a decreased need for narcotic pain medication. Compared to general anesthesia, conscious sedation offers advantages such as faster recovery, reduced reliance on narcotics, and improved pain management after surgery..(Wang XX, 2016 Jan 1 [cited 2024 Sep 9)

Patients undergoing csea had shorter time to discharge, less postoperative pain, and faster recovery times than those under ga.Csea provides better pain management, faster discharge, and improved postoperative recovery than ga. Both ga and csea were both safe and efficient, with csea linked to more stable hemodynamics during surgery and speedier post-op recovery times. Invariant words: alliterated years its more stable hemodynamics will make csea a better option for some people, particularly those with cardiovascular risks. (PierluigiGiampaolino, 2022 Jun 27;)

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METHEDOLOGY

During gasless single-port laparoscopic surgery (spa), we looked at patients who qualified for general anesthesia in addition to combination spinal epidural anesthesia (csea) and the kind of operation they had. Ninety patients' medical data from March 1, 2018, to June 30, 2020, were retrospectively analyzed. Using a j-shaped retractor, these patients had laparoscopic gasless spa procedures.The Institutional Review Board granted permission for the study.We searched for patient data pertaining to gasless single port laparoscopic procedures carried out in CSEA/GA.anesthesia technique during the period of March 1, 2018 and June 30, 2020.A cohort was identified that underwent SPG laparoscopy in gynecological addicted patients that was 1:2 matched by surgery type.All patients signed consent forms, were willing to undergo laparoscopic hysterectomy or laparotomy when indicated.In their preparatory consultations with the surgeon, the patients were informed of the advantages and disadvantages of both GA and CSEA anesthesia, as well as the decision-making process.The patients were informed that should CSEA be in short supply, the patient's wishes would dictate they be defaulted to GA.

Preoperative evaluation of the patients included the surgical requirements, demographic data, and specific information of the patient's physical condition.Components included age, height, type of anesthesia, type of surgery performed, number of births (obstetrical history), per abdominal surgical procedures, and serum tumor markers which is CA 125.Operational characteristics included the kind of surgery, expected bleeding, beginning time, total operating time, and other concurrently conducted surgeries. The period of time between the beginning of the cord cut and the establishment of the cavity, the application of the wound retractor, and the positioning of the Thompson and J-retractors was referred to as setup time. The vascular, intestinal, and urinary systems were among the most serious possible outcomes. The rate of conversion to laparotomy, whether a second trocar was inserted, and other perioperative surgical findings such significant pelvic adhesion, mass rupture, and cyst torsion were also evaluated factors. The adverse effects of CSEA were also assessed.

In regard to this particular research, respondents will partake in an observational study of gynee patients from 2020-2024.This observational study will take five years to complete.We will execute this observational study under consent where we will aim to gather data in August and July while we introduce ourselves and conduct a literature review as a way of covering our August.For the second month, we expect to get the methodology complete by conducting a statistical analysis.We anticipate to finish the dissertation and achieve the expected findings by the third of mass, and torsion of the cyst.Negative consequences following CSEA were also evaluated.

All age groups o Both male and female patients o Patients with neurological pathologies.

Preexisting spinal irregularities or infections or any such conditions which may make it difficult to perform spinal anesthesia.Make sure the patients have understood all the risk factors, advantages, and other techniques and you give them the freedom to choose what they want to go for.

Research Design Ethical Considerations Recruitment of study Sample The details of the administration of the anesthetic agent6.Intra operative monitoring.

The following graphs were used to assess the validity of the data gathering. Comparative Evaluation of Statistical Data.

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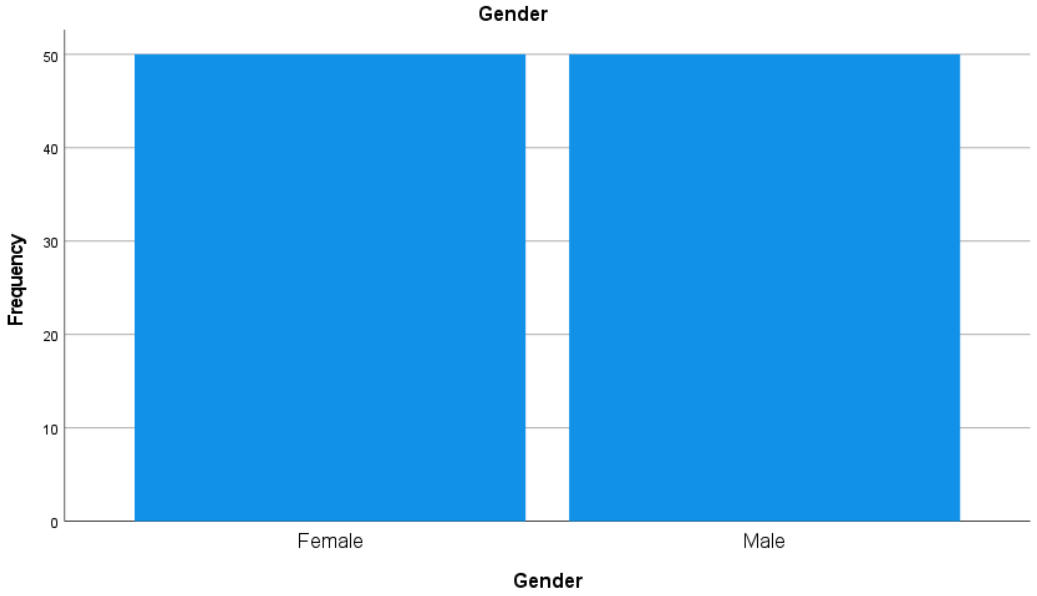
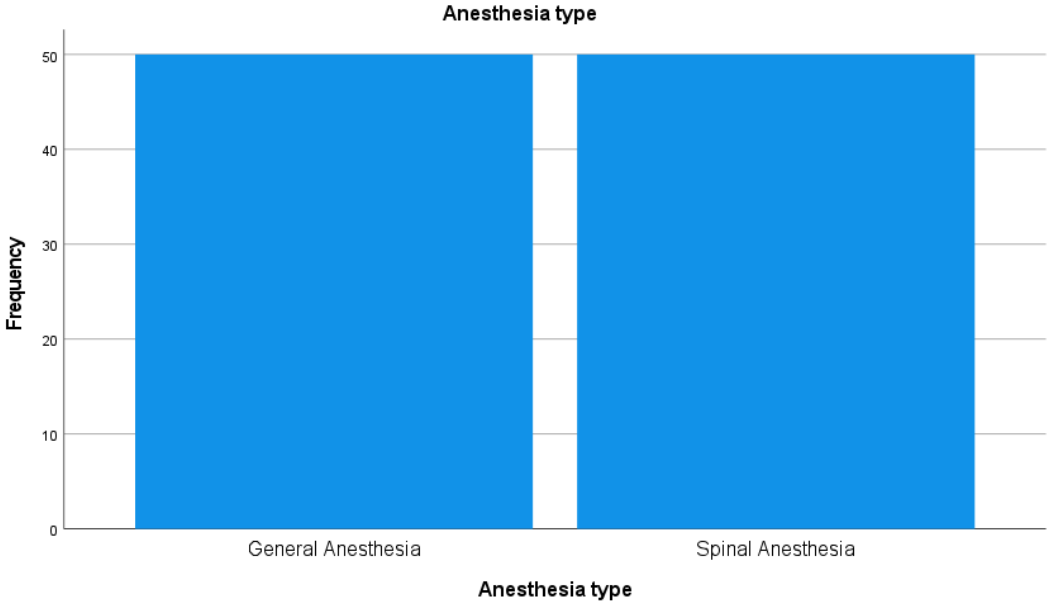
Results





Statistics

Age

N	Valid	100
	Missing	0
Mean		76.50
Median		76.50
Std. Deviation		29.011

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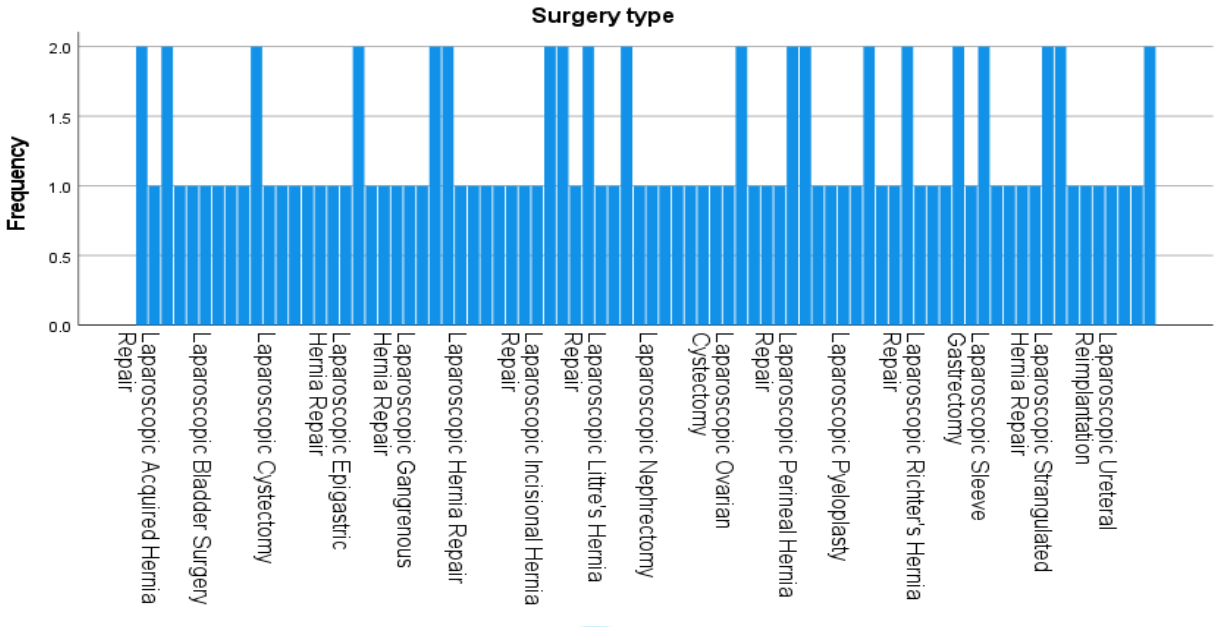

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
Age	Equal variances assumed	1.433	.234	-.419	98
	Equal variances not assumed			-.419	96.405

Independent Samples Test

		t-test for Equality of Means			
		Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower
Age	Equal variances assumed	.676	-2.440	5.827	-14.003
	Equal variances not assumed	.676	-2.440	5.827	-14.005

Independent Samples Test

		t-test for Equality of Means 95% Confidence Interval of the Difference Upper
Age	Equal variances assumed	9.123
	Equal variances not assumed	9.125

T-test Results

t = -0.419

The difference between the means in relation to the information variability is measured by the t-statistic. A negative number means that Group 1's average is lower than Group 2's mean.

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P-value (2-tailed) = 0.676
Since the p-value is higher than 0.05, it can be concluded that there is no statistically significant variance in the mean ages of the two groups.(24)

Equal Variances Not Assumed
The results are nearly identical to the equal variances assumed case (25)

T = -0.419, p-value = 0.676
The finding that the groups do not significantly differ from one another The two groups' mean ages do not differ in a way that is statistically significant (p = 0.676).
Any reported difference is probably the result of random fluctuation rather than a real difference between the groups, as indicated by the modest mean difference (-2.440) and the large confidence range. Since p = 0.234 indicates that the premise of equal variances is true, the findings from the "equal.

Discussion:
Using an independent samples t-test to examine the mean ages of two separate groups, the study's findings showed no statistically significant difference (t = -0.419, p = 0.676). This result implies that in this situation, age is not a defining characteristic of the two groups. We go over the ramifications, restrictions, and possible avenues for further study in light of these findings below.

CONCLUSION:
The independent samples t-test conducted to compare the mean ages of two groups revealed no statistically significant difference (t = -0.419, p = 0.676). The mean age difference of -2.44 units, while suggesting that Group 1 is slightly younger than Group 2, was not large enough to be considered meaningful given the high variability in the data and the wide 95% confidence interval (-14.003 to 9.123). The assumption of equal variances was met (Levene's test, p = 0.234), supporting the validity of the t-test results.