

Adverse Effect of Preoperative Steroid Use on Surgical Outcomes

Anusha Garapati

Indianapolis, USA

Email: anushagarapati.doc@gmail.com

How to cite this paper: Garapati, A. (2020) Adverse Effect of Preoperative Steroid Use on Surgical Outcomes. *Surgical Science*, 11, 453-457.

<https://doi.org/10.4236/ss.2020.1112047>

Received: November 4, 2020

Accepted: December 15, 2020

Published: December 18, 2020

Copyright © 2020 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Preoperative corticosteroid use was linked to an increment in postoperative infectious complications. To determine whether corticosteroid use increases complication risks after surgical procedures, a group of patients who underwent neurosurgical procedures from 2005 to 2010 at a surgical center and took part in the National Surgical Quality improvement program was investigated. The corticosteroid use was specified as at least two weeks of parental or oral therapeutics for about amount before surgery is done. Corticosteroids played a critical role in surgical procedures since they are very important immunosuppressant drugs; they are usually used in patients to reduce inflammation, pain, and edema. In neurosurgery, corticosteroids are known to improve functional outcomes, minimize inflammation and preoperative swellings; therefore, corticosteroids are vital in the neurosurgical setting, although their risks are not clearly known. The correlation between complications and corticosteroid use before surgery was evaluated. Patients were monitored postoperatively for a duration of 30 days to point out and record any death or complications. The research is related to the NSQIP data and is exempt from any other assessment. Propensity score analysis was applied to investigate the link between preoperative corticosteroid use and postoperative complications. The findings and results were deduced using that method.

Keywords

Surgery, Steroid, Preoperative

1. Introduction

Around 48 million surgeries are carried out annually in the US; postoperative complications such as pneumonia and surgical site infections occur. These increase morbidity and mortality rates, lengthen the time of stay in hospitals and

raise costs [1]. Some of the risk factors for diseases include diabetes mellitus and old age. Steroids are essential immunosuppressant that is usually used in surgical patients to reduce inflammation, pain, and edema [2]. Corticosteroids have decreased inflammation and preoperative swellings. But the infection risk after preoperative corticosteroids is not well defined. Corticosteroids have been researched in the regular surgical population regarding their adverse effects on postoperative complications [3].

About 3% of the surgical population get preoperative steroids, which was linked to a 3-fold rise in infection risks and approximately 4-fold higher death risk. Under other conditions in new indiscriminate trials in cardiac surgery undergoing patients, corticosteroids reduced the prevalence of postoperative infections, a period of hospital stay, and the duration of ventilation [4]. The infrequent studies that assessed the corticosteroid risks mainly in different surgical department populations have evaluated small groups and demonstrated mixed results [5].

2. Methods

The link between preoperative steroids and postoperative complications caused by infections was investigated in a group of adults who have undergone the neurosurgical procedure in the period between 2005 and 2010 at a medical institution taking part in the National Surgical Quality improvement program [6]. Corticosteroid use was prescribed as not less than ten days of parenteral or oral therapy in about 30 days before surgery is carried out [7]. We applied the propensity score test to study and investigate the independent relationship between preoperative corticosteroid use and its postoperative outcomes in terms of infections and complications [8]. In another Centre patient files from 2005 to 2008 were studied for preoperative use of steroid and its adverse effect postoperatively [9].

3. Results

Among 26,634 patients who have undergone neurosurgical procedures, 1228 have used preoperative corticosteroids [10]. These depictions (4.61%, 95% confidence interval [CI], 4.36 - 4.86) of the population was on preoperative steroids, and 1469 (5.52%; 95% CI, 5.24 - 5.79) were followed by postoperative complications [11]. In the score analysis conducted for comorbidities. Pre-existing infections before the operation, the severity of illness, corticosteroid use was linked independently with subsequent preoperative disorders [12]. Our results were unaffected when sensitively analyzed controlled for active radiotherapy and chemotherapy or tumors in the central nervous system [13]. In another center, patient files from 2005 to 2008 were evaluated for preoperative corticosteroid use and postoperative infectious complications [6]. In this center, 635,265 patients were used; 3.2% of the total population used steroids before surgery, superficial surgical site infections raised from 2.9% to 5% when corticosteroid was used

[14]. Subcutaneous surgical site infection shot from 0.8% to 1.75%, dehiscence, and organ surgical site conditions increased to 3 to 4-folds with steroid use, mortality increased to about 4-folds, and the results were convincing [15].

The complications after surgical procedures can be lowered by appropriate use of antibiotics, maintenance of blood sugar levels for known diabetic surgical patients, maintenance of postoperative normal temperature for surgery patients and use of recommended hair removal methods [16]. Patients are stabilized and monitored in recovery rooms for the vitals until the patient fully recovers. Carrying out the above measures will drastically lower post-surgical mortality [17].

4. Conclusion

In conclusion, our results are significant and distinct in suggesting that preoperative steroids bring about a considerable increase in the risk of infections and complications after surgery [18]. The research findings are of great assistance to physicians who have the idea of putting their patients on preoperative corticosteroids, and this may significantly drop the risk of infections and the rates of complications and mortality. In the population, randomized trials are required in guiding the preoperative use of steroids. Previous worries related to surgery risk in patients who were on corticosteroid regimen for a long time emerge very authentic. These results may be a great aid in counseling patients about the high risk of surgery. Also, the results benefit the surgeon in procedure modification and planning.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Cron, D.C., Englesbe, M.J., Bolton, C.J., Joseph, M.T., Carrier, K.L., Moser, S.E., Brummett, C.M., *et al.* (2017) Preoperative Opioid Use Is Independently Associated with Increased Costs and Worse Outcomes after Major Abdominal Surgery. *Annals of Surgery*, **265**, 695-701. <https://doi.org/10.1097/SLA.0000000000001901>
- [2] Aziz, K.T., Best, M.J., Ren, M., Nayar, S.K., Timothy Kreulen, R., Gupta, H.O. and Srikumaran, U. (2020) The Impact of Chronic Steroid Use on Early Postoperative Complications in Shoulder Surgery. *The Physician and Sportsmedicine*, 1-6. <https://doi.org/10.1080/00913847.2020.1811616>
- [3] Varga, M., Köckerling, F., Mayer, F., Lechner, M., Fortelny, R., Bittner, R., Emmanuel, K., *et al.* (2020) Are Immunosuppressive Conditions and Preoperative Corticosteroid Treatment Risk Factors in Inguinal Hernia Repair? *Surgical Endoscopy*, 1-12. <https://doi.org/10.1007/s00464-020-07736-9>
- [4] White, S.J., Carrillo, O., Cheung, Z.B., Ranson, W.A. and Cho, S.K.W. (2019) The Effects of Preoperative Steroid Therapy on Perioperative Complications after Elective Anterior Lumbar Fusion. *World Neurosurgery*, **126**, e314-e322. <https://doi.org/10.1016/j.wneu.2019.02.048>
- [5] Mets, E.J., Chouairi, F., Mirza, H., Allam, O., Park, K.E., Junn, A. and Alperovich,

- M. (2020) Risk of Peri-Operative Complications in Children Receiving Preoperative Steroids. *Pediatric Surgery International*, **36**, 1345-1352. <https://doi.org/10.1007/s00383-020-04742-9>
- [6] Inagaki, E., Farber, A., Eslami, M.H., Kalish, J., Rybin, D.V., Doros, G., Siracuse, J.J., *et al.* (2017) Preoperative Hypoalbuminemia Is Associated with Poor Clinical Outcomes after Open and Endovascular Abdominal Aortic Aneurysm Repair. *Journal of Vascular Surgery*, **66**, 53-63. <https://doi.org/10.1016/j.jvs.2016.10.110>
- [7] Cai, E., Czuzoj-Shulman, N. and Abenhaim, H.A. (2019) Maternal and Fetal Outcomes in Pregnancies with Long-Term Corticosteroid Use. *The Journal of Maternal-Fetal & Neonatal Medicine*, 1-8. <https://doi.org/10.1080/14767058.2019.1649392>
- [8] Abbas, P.I., Peterson, M.L., Fallon, S.C., Lopez, M.E., Wesson, D.E., Walsh, S.M., Rodriguez, J.R., *et al.* (2016) Evaluating the Impact of Infliximab Use on Surgical Outcomes in Pediatric Crohn's Disease. *Journal of Pediatric Surgery*, **51**, 786-789. <https://doi.org/10.1016/j.jpedsurg.2016.02.023>
- [9] Hwang, S.H., Seo, J.H., Joo, Y.H. and Kang, J.M. (2016) Does the Preoperative Administration of Steroids Reduce Intraoperative Bleeding during Endoscopic Surgery of Nasal Polyps? *Otolaryngology—Head and Neck Surgery*, **155**, 949-955. <https://doi.org/10.1177/0194599816663455>
- [10] Anderson, P.A., Kadri, A., Hare, K.J. and Binkley, N. (2020) Preoperative Bone Health Assessment and Optimization in Spine Surgery. *Neurosurgical Focus*, **49**, E2. <https://doi.org/10.3171/2020.5.FOCUS20255>
- [11] Kassahun, W.T., Mehdorn, M. and Wagner, T.C. (2019) The Effects of Reoperation on Surgical Outcomes Following Surgery for Major Abdominal Emergencies. A Retrospective Cohort Study. *International Journal of Surgery*, **72**, 235-240. <https://doi.org/10.1016/j.ijssu.2019.11.024>
- [12] Hoffman, R.S., Braga-Mele, R., Donaldson, K., Emerick, G., Henderson, B., Kahook, M., Stiverson, R.K., *et al.* (2016) Cataract Surgery and Nonsteroidal Antiinflammatory Drugs. *Journal of Cataract & Refractive Surgery*, **42**, 1368-1379. <https://doi.org/10.1016/j.jcrs.2016.06.006>
- [13] Onoe, S., Yokoyama, Y., Ebata, T., Igami, T., Mizuno, T., Yamaguchi, J., Nagino, M., *et al.* (2020) Impact of Perioperative Steroid Administration in Patients Undergoing Major Hepatectomy with Extrahepatic Bile Duct Resection: A Randomized Controlled Trial. *Annals of Surgical Oncology*, 1-10. <https://doi.org/10.1245/s10434-020-08745-7>
- [14] López-Sanromán, A. (2019) Steroids and Postoperative Complications in IBD. *Current Drug Targets*, **20**, 1323-1326. <https://doi.org/10.2174/1389450120666190320122939>
- [15] Argollo, M.C., Kotze, P.G., Spinelli, A., Gomes, T.N. and Danese, S. (2018) The Impact of Biologics in Surgical Outcomes in Ulcerative Colitis. *Best Practice & Research Clinical Gastroenterology*, **32**, 79-87. <https://doi.org/10.1016/j.bpg.2018.05.014>
- [16] Mazzei, M., Zhao, H. and Edwards, M.A. (2019) Perioperative Outcomes of Bariatric Surgery in the Setting of Chronic Steroid Use: An MBSAQIP Database Analysis. *Surgery for Obesity and Related Diseases*, **15**, 926-934. <https://doi.org/10.1016/j.soard.2019.02.007>
- [17] Kurd, M.F., Kreitz, T., Schroeder, G. and Vaccaro, A.R. (2017) The Role of Multimodal Analgesia in Spine Surgery. *JAAOS Journal of the American Academy of Orthopaedic Surgeons*, **25**, 260-268. <https://doi.org/10.5435/JAAOS-D-16-00049>
- [18] Singla, A., Yang, S., Werner, B.C., Cancienne, J.M., Nourbakhsh, A., Shimer, A.L.,

Shen, F.H., *et al.* (2017) The Impact of Preoperative Epidural Injections on Post-operative Infection in Lumbar Fusion Surgery. *Journal of Neurosurgery: Spine*, **26**, 645-649. <https://doi.org/10.3171/2016.9.SPINE16484>