Dexamethasone for chronic subdural hematoma

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- Efficacy and safety of steroids for chronic subdural hematoma: A systematic review and metaanalysis

Since glucocorticoids have been used for treatment of chronic subdural hematoma in 1962 their role is still discussed controversially in lack of evident data. On the basis of the ascertained inflammation cycle in cSDH dexamethasone will be an ideal substance for a short lasting, concomitant treatment protocol.

Steroids may have a potential role in reducing CSDH recurrence but do not appear to confer significant advantages in terms of mortality or functional outcomes. However, their use is associated with a higher risk of adverse effects and complications. Given the limitations of existing studies, further research is needed to refine the role of steroids in CSDH management, considering patient-specific factors and treatment protocols¹⁾.

Berghauser et al. stated in 2013 that the proportion of patients primarily treated with corticosteroids are increasing year by year $^{2)}$

Patients with lower grades of CSDH can be treated successfully with steroids. Female patients seem

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to do better with steroids ³⁾.

In 2020 in the The New England Journal of Medicine among adults with symptomatic chronic subdural hematoma, most of whom had undergone surgery to remove their hematomas during the index admission, treatment with dexamethasone resulted in fewer favorable outcomes and more adverse events than placebo at 6 months, but fewer repeat operations were performed in the dexamethasone group. (Funded by the National Institute for Health Research Health Technology Assessment Programme; Dex-CSDH ISRCTN number, ISRCTN80782810.)⁴⁾.

Narrative review or commentary based on the synthesis and interpretation of available evidence from various sources, including clinical trials, observational studies, and clinical practice surveys

The recent trials exploring the use of dexamethasone in CSDH have raised questions about its efficacy and safety, particularly in light of adverse outcomes observed in some cases.

While the Dex-CSDH and DECSA trials have shown unfavorable outcomes associated with dexamethasone use, it's important to recognize the heterogeneous nature of CSDH and the potential for subgroup differences in treatment response. For example, subgroup analysis focusing on patients with lower Markwalder grades might reveal different outcomes, suggesting that dexamethasone could still have a role in carefully selected populations.

Moreover, historical examples from neurosurgical literature, such as the STICH and ARUBA trials, demonstrate the importance of nuanced interpretation of trial results and the potential for treatment efficacy to vary across patient subgroups. Just as surgery was ultimately found to be beneficial in specific cases despite initially unfavorable trial results, the role of dexamethasone in CSDH management might require further investigation in targeted patient populations.

The absence of formal guidelines for CSDH management underscores the need for continued research and careful consideration of available evidence. While dexamethasone's current role may be uncertain based on existing data, it's premature to entirely dismiss its potential utility, especially considering the ongoing evolution of treatment approaches and the need for personalized care strategies.

In conclusion, while recent trials have cast doubt on the efficacy of dexamethasone in CSDH management, further analysis and exploration of patient subgroups may reveal nuanced insights into its potential role. Continued research efforts, guided by the principles of evidence-based medicine and tailored to individual patient needs, are essential for optimizing outcomes in this challenging clinical scenario⁵⁾

Surveys

Forty-two percent of surgeons never prescribe steroids and 55% prescribe them to those managed conservatively ⁶⁾.

In another Canadian survey regarding neurosurgical practice of treatment of CSDH, <15% of neurosurgeons prefer using high-dose corticosteroid $^{7\prime}$

Literature Reviews

Current evidence implicates a potentially beneficial role of dexamethasone in the management of CSDH. However, it remains unclear whether the rate of crossover to surgery is reduced in patients treated with corticosteroids compared with those managed conservatively. A longer duration of study with detailed analysis of individual cases and appropriately randomized cohorts are necessary to draw more reliable conclusions⁸⁾

Systematic Reviews

Chronic subdural hematoma recurrence after evacuation occurs in approximately 10% of chronic subdural hematomas, and the various Chronic subdural hematoma surgery interventions are approximately equivalent. Corticosteroids are associated with reduced recurrence but also increased morbidity. Drains reduce the risk of recurrence, but the position of drain (subdural vs subgaleal) did not influence recurrence. Middle meningeal artery embolization is a promising treatment warranting further evaluation in randomized trials ⁹.

Scerrati et al. performed a systematic review according to PRISMA criteria of the studies analyzing the nonsurgical strategies for CSDHs. They collected all papers in the English language published between 1990 and 2019 by searching different medical databases. The chosen keywords were "chronic subdural hematoma," "conservative treatment/management," "pharmacological treatment," "non-surgical," "tranexamic acid," "dexamethasone," "corticosteroid," "glucocorticoid," "middle meningeal artery," "endovascular treatment," and "embolization."

The authors ultimately collected 15 articles regarding the pharmacological management of CSDHs matching the criteria, and 14 papers included the endovascular treatment.

The results showed that surgery still represents the mainstay in cases of symptomatic patients with large CSDHs; however, adjuvant and alternative therapies can be effective and safe in a carefully selected population. Their inclusion in new guidelines is advisable ¹⁰.

A meta-analysis of Holl et al. from 29019 suggested that the addition of corticosteroids to surgery might be effective in the treatment of CSDH. However, the results must be interpreted with caution in light of the serious risk of bias of the included studies. This study stresses the need for large

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randomized trials to investigate the use of corticosteroids in the management of CSDH ¹¹

In 2017 a study of Yao et al. had no enough evidence to support DX use as an effective alternation to surgical therapy. But adjuvant DX use may facilitate the surgical therapy by reducing Chronic subdural hematoma recurrence. Further study focusing on adjuvant DX was required ¹²

Trials

Dex-CSDH trial

Among adults with symptomatic chronic subdural hematoma, most of whom had undergone surgery to remove their hematomas during the index admission, treatment with dexamethasone resulted in fewer favorable outcomes and more adverse events than placebo at 6 months, but fewer repeat operations were performed in the dexamethasone group. (Funded by the National Institute for Health Research Health Technology Assessment Programme; Dex-CSDH ISRCTN number, ISRCTN80782810.)¹³⁾.

DECSA trial

see DECSA trial.

SUCRE trial

see SUCRE trial.

DRESH study

A study is designed as a double-blind randomized placebo-controlled trial 820 patients who are operated for cSDH and from the age of 25 years are included after obtaining informed consent. They are randomized for administration of dexamethasone (16-16-12-12-8-4 mg/d) or placebo (maltodextrin) during the first 48 hours after surgery. The type I error is 5% and the type II error is 20%. The primary endpoint is the reoperation within 12 weeks postoperative.

This study tests whether dexamethasone administered over 6 days is a safe and potent agent in relapse prevention for evacuated cSDH $^{14)}$.

Prospective randomised placebo-controlled trial (PRPCT)

In the randomized trial by Hutchinson et al., a 2-week tapering course of dexamethasone was compared with placebo with respect to the goal of lessening disability, in part by reducing the need for surgical evacuation and reevacuation. The primary end point of the trial was the percentage of patients with a favorable outcome (a score of 0 [no symptoms] to 3 [moderate symptoms]) on the modified Rankin scale of disability at 6 months, albeit 60% of the patients had scores in the favorableoutcome category at the start of the trial. Approximately 20% of the patients had bilateral collections. Among the 680 symptomatic patients who were followed up through 6 months, the main result was paradoxical; a favorable outcome was reported in 90% of the patients who received placebo and in 84% of those who received dexamethasone. The effect of glucocorticoids in reducing the need for an initial operation could not be determined because approximately 90% of the patients in both trial groups had the subdural collection evacuated. In one of several secondary outcome analyses, reoperation was performed in 8% of the patients in the placebo group and in 2% of those in the dexamethasone group. Both percentages are low, and the confidence intervals around the odds ratio included one. In the end, the lower percentage of patients who had a favorable disability outcome and the occurrence of more adverse events in the dexamethasone group tip the scale against using the drug. Although the trial answers an important question that has lingered for 50 years by showing no benefit of glucocorticoids with respect to the disability outcome, it is perhaps less certain on the issue of whether glucocorticoids shrink the subdural collection and reduce the need for reoperations. The results of this trial reduce the enthusiasm for treating chronic subdural hematomas with glucocorticoids ¹⁵⁾.

Mebberson et al. presented an interim analysis of the first registered prospective randomised placebo-controlled trial (PRPCT) of adjuvant DX on RR and outcome after CSDH surgery with post-operative drainage. Participants were randomised to either placebo or a reducing DX regime over 2 weeks, with CSDH evacuation and post-operative drainage. Post-operative mortality (POMT) and RR were determined at 30 days and 6 months; modified Rankin Score (mRS) at discharge and 6 months. Post-operative morbidity (POMB) and adverse events (AEs) were determined at 30 days. Interim analysis at approximately 50% estimated sample size was performed (n = 47). Recurrences were not observed with DX: only with placebo (0/23 [0%] v 5/24 [20.83%], P = 0.049). There was no significant between-group differences in POMT, POMB, LOS, mRS or AEs. CONCLUSIONS: In this first registered PRPCT, interim analysis suggested that adjuvant DX with post-operative drainage is both safe and may significantly decrease recurrences. A 12.5% point between-groups difference may be reasonable to power a final sample size of approximately n = 89. Future studies could consider adjuvant DX for longer than the arbitrarily-chosen 2 weeks ¹⁶.

Twenty patients with imaging-confirmed CSDH were recruited from a single center and randomized to receive dexamethasone (12 mg/day for 3 weeks followed by tapering) or placebo as a conservative treatment. Patients were followed for 6 months and the rate of success of conservative treatment with dexamethasone versus placebo was measured. Parameters such as hematoma thickness and clinical changes were also compared before and after treatment with chi-square tests. Adverse events and complications were documented.

Results: During the 6-month follow-up, one of ten patients treated with corticosteroids had to undergo surgical drainage and three of ten patients were treated surgically after placebo treatment. At the end

of the study, all remaining patients had complete radiological resolution. No significant differences were observed in terms of hematoma thickness profile and impression of change; however, patients experienced more severe side effects when treated with steroids as compared with placebo. Dexamethasone contributed to many serious adverse events.

Given the small sample size, these preliminary results have not shown a clear beneficial effect of dexamethasone against placebo in our patients. However, the number of secondary effects reported was much greater for corticosteroids, and dexamethasone treatment was responsible for significant complications ¹⁷⁾.

Prospective studies

Sunet al. prospectively studied a group of 30 patients, who were managed non-operatively: 26 patients were treated with dexamethasone (Group 1) and four patients expectantly (Group 4). Nineteen patients (73%) from Group 1 were confused or had focal neurological deficits on admission. The mean maximum thickness of the CSDH was 12 mm. Only one of these cases (4%) required surgical drainage 6 weeks after steroid therapy. One patient died of an unrelated stroke (mortality = 4%). Two patients (8%) were left severely disabled. No significant complication from steroid therapy was documented. Out of the 85 surgically treated patients, 69 patients underwent surgical drainage in addition to steroid therapy (Group 2). Thirteen patients were treated with burr-hole drainage only (Group 3). The mean maximum thickness of the CSDH for these two groups were both 16 mm. Comparing with group 1, the redrainage rate of Group 2 [4% (3/69, p = 1)] and that of Group 3 [15% (2/13, p = 0.253)] were not significantly different. 50% of patients in Group 4 (2/4, p = 0.039) required delayed surgical drainage. The mortality rates of Groups 2, 3 and 4 were 3% (2/69, p = 1), 15% (2/13, p = 0.253) and 50% (2/4, p = 0.039), respectively. Our results suggest that steroid treatment in a selected group of patients is a good option, particularly in patients with co-morbidity ¹⁸.

Retrospective cohort studies

A study aimed to investigate the predictive factors of therapeutic efficacy for chronic subdural hematoma (CSDH) patients receiving atorvastatin combined with dexamethasone therapy by using clinical imaging characteristics in conjunction with computed tomography (CT) texture analysis (CTTA). Clinical imaging characteristics and CT texture parameters at admission were retrospectively investigated in 141 CSDH patients who received atorvastatin combined with dexamethasone therapy from June 2019 to December 2022. The patients were divided into a training set (n = 81) and a validation set (n = 60). Patients in the training data were divided into two groups based on the effectiveness of the treatment. Univariate and multivariate analyses were performed to assess the potential factors that could indicate the prognosis of CSDH patients in the training set. The receiver operating characteristic (ROC) curve was used to analyze the predictive efficacy of the significant factors in predicting the prognosis of CSDH patients and was validated using a validation set. The multivariate analysis showed that the hematoma density to brain parenchyma density ratio, singal min (minimum) and singal standard deviation of the pixel distribution histogram, and inhomogeneity were independent predictors for the prognosis of CSDH patients based on atorvastatin and dexamethasone therapy. The area under the ROC curve between the two groups was between 0.716 and 0.806. As determined by significant factors, the validation's accuracy range was 0.816 to 0.952.

Clinical imaging characteristics in conjunction with CTTA could aid in distinguishing patients with CSDH who responded well to atorvastatin combined with dexamethasone ¹⁹⁾.

References

1)

Haseeb A, Shafique MA, Kumar A, Raqib MA, Mughal ZUN, Nasir R, Sinaan Ali SM, Ahmad TKF, Mustafa MS. Efficacy and safety of steroids for chronic subdural hematoma: A systematic review and metaanalysis. Surg Neurol Int. 2023 Dec 29;14:449. doi: 10.25259/SNI_771_2023. PMID: 38213424; PMCID: PMC10783700.

Berghauser Pont LM, Dippel DW, Verweij BH, Dirven CM, Dammers R. Ambivalence among neurologists and neurosurgeons on the treatment of chronic subdural hematoma: a national survey. Acta Neurol Belg. 2013 Mar;113(1):55-9. doi: 10.1007/s13760-012-0130-1. Epub 2012 Sep 14. PMID: 22975837.

Thotakura AK, Marabathina NR. Nonsurgical Treatment of Chronic Subdural Hematoma with Steroids. World Neurosurg. 2015 Dec;84(6):1968-72. doi: 10.1016/j.wneu.2015.08.044. Epub 2015 Sep 2. PMID: 26342776.

4) 13)

Hutchinson PJ, Edlmann E, Bulters D, Zolnourian A, Holton P, Suttner N, Agyemang K, Thomson S, Anderson IA, Al-Tamimi YZ, Henderson D, Whitfield PC, Gherle M, Brennan PM, Allison A, Thelin EP, Tarantino S, Pantaleo B, Caldwell K, Davis-Wilkie C, Mee H, Warburton EA, Barton G, Chari A, Marcus HJ, King AT, Belli A, Myint PK, Wilkinson I, Santarius T, Turner C, Bond S, Kolias AG; British Neurosurgical Trainee Research Collaborative; Dex-CSDH Trial Collaborators. Trial of Dexamethasone for Chronic Subdural Hematoma. N Engl J Med. 2020 Dec 31;383(27):2616-2627. doi: 10.1056/NEJMoa2020473. Epub 2020 Dec 16. PMID: 33326713.

Wells AJ. Commentary: Will dexamethasone ever have a role in the management of chronic subdural hematomas? Brain Behav. 2024 Feb;14(2):e3446. doi: 10.1002/brb3.3446. PMID: 38409926; PMCID: PMC10897353.

Santarius T, Lawton R, Kirkpatrick PJ, Hutchinson PJ. The management of primary chronic subdural haematoma: a questionnaire survey of practice in the United Kingdom and the Republic of Ireland. Br J Neurosurg. 2008 Aug;22(4):529-34. doi: 10.1080/02688690802195381. PMID: 18686063.

Cenic A, Bhandari M, Reddy K. Management of chronic subdural hematoma: a national survey and literature review. Can J Neurol Sci. 2005 Nov;32(4):501-6. doi: 10.1017/s0317167100004510. PMID: 16408582.

Petralia CCT, Manivannan S, Shastin D, Sharouf F, Elalfy O, Zaben M. Effect of Steroid Therapy on Risk of Subsequent Surgery for Neurologically Stable Chronic Subdural Hemorrhage-Retrospective Cohort Study and Literature Review. World Neurosurg. 2020 Jun;138:e35-e41. doi: 10.1016/j.wneu.2020.01.160. Epub 2020 Feb 27. PMID: 32113994.

Henry J, Amoo M, Kissner M, Deane T, Zilani G, Crockett MT, Javadpour M. Management of Chronic Subdural Hematoma: A Systematic Review and Component Network Meta-analysis of 455 Studies With 103 645 Cases. Neurosurgery. 2022 Dec 1;91(6):842-855. doi: 10.1227/neu.00000000002144. Epub 2022 Sep 28. PMID: 36170165.

10)

Scerrati A, Visani J, Ricciardi L, Dones F, Rustemi O, Cavallo MA, De Bonis P. To drill or not to drill, that is the question: nonsurgical treatment of chronic subdural hematoma in the elderly. A systematic

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review. Neurosurg Focus. 2020 Oct;49(4):E7. doi: 10.3171/2020.7.FOCUS20237. PMID: 33002869.

Holl DC, Volovici V, Dirven CMF, van Kooten F, Miah IP, Jellema K, Peul WC, van der Gaag NA, Kho KH, den Hertog HM, Dammers R, Lingsma HF. Corticosteroid treatment compared with surgery in chronic subdural hematoma: a systematic review and meta-analysis. Acta Neurochir (Wien). 2019 Jun;161(6):1231-1242. doi: 10.1007/s00701-019-03881-w. Epub 2019 Apr 10. PMID: 30972566.

Yao Z, Hu X, Ma L, You C. Dexamethasone for chronic subdural haematoma: a systematic review and meta-analysis. Acta Neurochir (Wien). 2017 Nov;159(11):2037-2044. doi: 10.1007/s00701-017-3309-7. Epub 2017 Sep 1. PMID: 28865006.

14)

Emich S, Richling B, McCoy MR, Al-Schameri RA, Ling F, Sun L, Wang Y, Hitzl W. The efficacy of dexamethasone on reduction in the reoperation rate of chronic subdural hematoma - the DRESH study: straightforward study protocol for a randomized controlled trial. Trials. 2014 Jan 6;15(1):6. doi: 10.1186/1745-6215-15-6. PubMed PMID: 24393328; PubMed Central PMCID: PMC3891985.

Ropper AH. Beneath a Tough Mother (Dura Mater) - Chronic Subdural Hematoma. N Engl J Med. 2020 Dec 31;383(27):2678-2680. doi: 10.1056/NEJMe2031257. Epub 2020 Dec 16. PMID: 33326714.

Mebberson K, Colditz M, Marshman LAG, Thomas PAW, Mitchell PS, Robertson K. Prospective randomized placebo-controlled double-blind clinical study of adjuvant dexamethasone with surgery for chronic subdural haematoma with post-operative subdural drainage: Interim analysis. J Clin Neurosci. 2020 Jan;71:153-157. doi: 10.1016/j.jocn.2019.08.095. Epub 2019 Sep 3. PMID: 31492485.

Prud'homme M, Mathieu F, Marcotte N, Cottin S. A Pilot Placebo Controlled Randomized Trial of Dexamethasone for Chronic Subdural Hematoma. Can J Neurol Sci. 2016 Mar;43(2):284-90. doi: 10.1017/cjn.2015.393. Epub 2016 Feb 8. PMID: 26853325.

Sun TF, Boet R, Poon WS. Non-surgical primary treatment of chronic subdural haematoma: Preliminary results of using dexamethasone. Br J Neurosurg. 2005 Aug;19(4):327-33. doi: 10.1080/02688690500305332. PMID: 16455539.

Sha Z, Wu D, Dong S, Liu T, Wu C, Lv C, Liu M, Jiang W, Yuan J, Nie M, Gao C, Liu F, Zhang X, Jiang R. The value of computed tomography texture analysis in identifying chronic subdural hematoma patients with a good response to polytherapy. Sci Rep. 2024 Feb 12;14(1):3559. doi: 10.1038/s41598-024-53376-7. PMID: 38347043; PMCID: PMC10861511.

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