Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Dexamethasone in community-acquired pneumonia

Sabine Meijvis and colleagues (June 11, p 2023)[1] investigated the role of adjuvant dexamethasone in community-acquired pneumonia. The primary outcome was median length of hospital stay, which was reported to be significantly shorter in the dexamethasone group (6·5 days) than in the placebo group (7·5 days).

However, Meijvis and colleagues do not show clinical or radiological cure rates with or without adjuvant dexamethasone therapy. In light of the poor clinical efficacy of steroids for pneumonia in previous studies,[2,3] a median difference of 1 day in length of hospital stay could easily be attributed to confounders such as variations in clinician behaviour and family assessment of a patient's readiness for discharge.[4]

Meijvis and colleagues should also have provided some absolute measures of treatment effect. We calculated the absolute risk reduction and number needed to treat to benefit, along with 95% CIs, for the outcome of hospital admission (webappendix).[5] Data were derived from figure 2 of the published study. We found that the absolute risk of remaining in hospital was 15% and 12% lower in the dexamethasone group than in the placebo group at days 8 and 12, respectively. Furthermore, we found that seven and eight patients with community-acquired pneumonia would need to be treated with adjuvant dexamethasone therapy (versus placebo) to result in early discharge of one additional patient on days 8 and 12 of hospital admission, respectively.

Notably, a significantly higher rate of hyperglycaemia was shown in the dexamethasone group (43%) than in the placebo group (23%; p<0·0001). Again for ease of clinical interpretation, we calculated the number needed to treat to harm, and it was 5 (95% CI 3–9). This finding indicates that, for every five patients treated with dexamethasone (versus placebo), one additional patient would have hyperglycaemia.

Overall, in terms of risk–benefit assessment, the estimated ratio between the number needed to harm and number needed to benefit (5/7 or 5/8) of less than unity does not fully support Meijvis and colleagues' claims of clinical meaningfulness of adjuvant dexamethasone therapy in community-acquired pneumonia.

We declare that we have no conflicts of interest.

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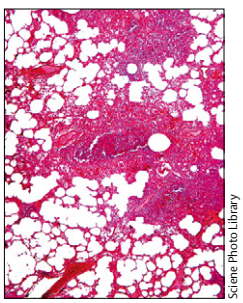
In a double-blind, placebo-controlled trial, Sabine Meijvis and colleagues[1] found clinical benefit of reduced length of hospital stay when dexamethasone was added to antibiotic treatment in immunocompetent patients with community-acquired pneumonia. However, of the 304 recruited cases, most had bacterial infections such as *Streptococcus pneumoniae*, and only seven (2·3%) were diagnosed as having influenza pneumonia (nine others [3·0%] had mixed influenza-bacterial infections, mostly *S pneumoniae*). As such, the results cannot be generalised to community-acquired pneumonia with viral causes.

Respiratory viruses are increasingly recognised as major causes of community-acquired pneumonia worldwide (up to about 20%),[2] and influenza virus is the most important pathogen, causing excessive hospital admissions and deaths, particularly during the seasonal peaks and pandemics. Evidence suggests that corticosteroid use in influenza pneumonia cannot control excessive inflammation, but compromises the immune response, leading to longer viral shedding, secondary bacterial and fungal infections, and even increased mortality (webappendix).[3,4] Controlled studies are needed to address the use of corticosteroids in viral pneumonia and its safety. Notably, in viral pneumonia caused by the coronavirus that causes severe acute respiratory syndrome, increased viral load has been documented with corticosteroid treatment in a randomised trial.[5]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See Online for webappendix

Given the differences in immunopathogenesis between viral and bacterial pneumonia, and the uncertainties in efficacy and safety,[4] we recommend that corticosteroids should not be used routinely in known viral community-acquired pneumonia, especially influenza-related. In this regard, availability of rapid and reliable diagnostics for the causes of community-acquired pneumonia is important to guide antimicrobial treatments (targeted, susceptible antibacterials; or antivirals such as neuraminidase inhibitors), and the use of adjuvant corticosteroids.[2,4]

See Online for webappendix

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Sabine Meijvis and colleagues[1] randomly assigned a cohort of patients with community-acquired pneumonia to receive intravenous dexamethasone or placebo and showed a significantly reduced length of hospital stay with dexamethasone.

Meijvis and colleagues state that the decision to discharge a patient was left to the treating medical team. One of the criteria for discharge is body temperature—a measurement affected by systemic corticosteroids. The effect seen by Meijvis and colleagues could be the defervescence caused by the corticosteroids and not a true shortening of severity of disease. Additionally, we have found that a rebound fever can occur after cessation of dexamethasone,[2] and this finding has been corroborated.[3] No reference was made to duration in hospital and long-term follow-up of patients' body temperature.

Moreover, dexamethasone could be detrimental. Non-steroidal anti-inflammatory drugs given before admission to the intensive-care unit for community-acquired pneumonia have been associated with a more severe hospital course.[4] In Meijvis and colleagues' study, the number of patients who had empyema was greater in the dexamethasone group, as was the length of stay in the intensive-care unit. Although these values are not significant statistically, they require attention before recommendations for the treatment of community-acquired pneumonia with corticosteroids are formalised.

Finally, the single case of gastric perforation, potentially caused by the trial drug, might be of greater significance if the beneficial effects of corticosteroids are in doubt.[5]

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Sabine Meijvis and colleagues[1] conclude that dexamethasone can reduce length of hospital stay in patients with community-acquired pneumonia. We would like to add some comments.

Their study addressed a selected population. Of patients admitted to hospital with community-acquired pneumonia, only 43% were enrolled. Of these patients, those requiring admission to the intensive-care unit (ICU) were excluded from the analysis of the length of hospital stay.

The rationale for defining ICU admission during the hospital stay as an endpoint was the systematic prescription of corticosteroids by the intensivists according to the surviving sepsis campaign protocol.[2] However, an update to this protocol[3] suggests that hydrocortisone be given only to patients with septic shock who respond poorly to fluid and vasopressor therapy.

Prediction of ICU admission of patients with community-acquired pneumonia is random. ICU admission rates and criteria vary widely across different health-care systems, revealing the lack of consensus.[4] Therefore, early identification of patients who will benefit from dexamethasone therapy seems difficult.

Meijvis and colleagues reported a reduction in median length of hospital stay by 1 day with dexamethasone. Daily monitoring and use of C-reactive protein concentrations as one of the criteria for hospital discharge might have favoured dexamethasone.[5]

Since Meijvis and colleagues showed only a slight effect of dexamethasone on the length of hospital stay and were unable to assess its effects on patients secondarily admitted to the ICU, we advocate prudent use of dexamethasone in community-acquired pneumonia until patients who might benefit from this treatment are better identified.

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